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National Consistency in Curriculum Outcomes, Statements of Learning*

K-10 SCOPE & SEQUENCE

Middle childhood: Science/Life and Living – *Students understand their own biology and that of other living things and recognise the interdependence of life.*

Typical sequence of content:

Year 4 → **Year 5** → **Year 6** → **Year 7**

When using animals, refer to *Guidelines for the care and use of animals in Western Australian schools and agricultural and TAFEWA colleges* and complete relevant documentation.

Interdependence of living things

Living things depend on each other and the environment in which they live	**Relationships that make up the living and non-living environment*** (Science/Civics & Citizenship)	**Biodiversity is the variety of living things (organisms) and the environments they are found in**	**Interdependence and balance within living and non-living environments*** (Science/Civics & Citizenship)
• ways in which living things interact/depend on each other and the environment to survive	• plants and animals within an environment depend on each other and have relationships to enable them to live together *(eg some birds use twigs to make a nest, lizards bask on rocks and wind disperses seed)*	• an ecosystem is a community of organisms and non-living environment. Biodiversity relies on a sustainable ecosystem	• a sustainable ecosystem relies on a balance within a living and non-living environment
• living things need the living (food) and non-living (shelter, water) environment to survive	• some animals and plants may have specific needs within the environment *(eg dead trees are important to animals such as numbats for food and cockatoos for shelter)*	• ecosystems can consist of many habitats of living things that can be very different	• organisms within an ecosystem have relationships which can help them survive or threaten their survival
			• survival of organisms in an environment is dependent on how well they are adapted to their environment *(eg insects with better camouflage are less likely to be seen and eaten)*

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**National Consistency in Curriculum Outcomes, Statements of Learning*

K-10 SCOPE & SEQUENCE

Typical sequence of content:

Year 4	Year 5	Year 6	Year 7
Interdependence of living things (continued)			
• habitats of living things depend on the environment *(eg possums living in a roof in the city, or possums living in a tree in the forest)*	• some living things work together to survive *(eg ants build a colony; bees live in a hive)*	• when elements of an ecosystem disappear, or new elements are introduced, the whole ecosystem can be affected *(eg a river drying up or the introduction of feral predators like foxes)*	• local and global conservation issues *(eg sustainable forests and water management; Indigenous land care practices)*
• systems can change due to the impact of natural factors *(eg climate changes such as drought, flooding and fire)*	• human activity can have an impact on an environment *(eg land clearing, farming practices, removing too many native organisms from an area and introducing non-native animals and plants)*	• humans cause a variety of impacts on natural systems both positive and negative, which may affect the quality of life *(eg over-fertilising gardens can run off into waterways and cause algal bloom in rivers, which affects aquatic life; land clearing removes habitat; Indigenous land care practices)*	• strategies for conservation and regeneration of disturbed natural environments *(eg tree planting may reduce salinity and stop soil erosion on farms)*
• helping threatened animals and plants and protecting their habitats and local environments	• introduced plants and animals can have an impact on a particular environment *(eg negative impact: the cane toad, feral animals and weeds)*	• local strategies for conservation *(eg planting native plants to attract bird life; removal of weeds from wetlands)*	• scientists engage in and find scientific work rewarding for a variety of reasons *(eg Steve Irwin's work in conservation, Emeritus Professor Ian Lowe's work in Australian conservation and sustainability)*
All living things have needs	**Living things have diverse roles in the environment*** (Science)	**Living things (organisms) need the living and non-living elements of an environment to survive**	**Relationships between organisms in living communities*** (Science)
• all living things have needs such as water, food and shelter	• the importance of diversity and the varying roles of living things in an environment *(eg roles of animals as scavengers, predators, carnivores, herbivores, pollinators)*	• the Sun is the original source of energy for living things	• animals in food chains are grouped according to whether they eat plants and/or animals

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**National Consistency in Curriculum Outcomes, Statements of Learning*

Typical sequence of content:

Year 4	Year 5	Year 6	Year 7
Interdependence of living things (continued)			
• plants' needs differ from animals *(eg plants require light and water to survive, plants make their own food, animals can't)* • simple food chains *(eg plants depend on sunlight to create food, forming the basis of most food chains)*	• living things have relationships that threaten their survival *(eg predators, disease and introduced species)*	• all living things form part of food chains *(eg plants use solar energy to create food, which forms the basis of food chains)* • living things have relationships that help them survive *(eg different organisms living together such as herds, flocks and colonies)*	• food chains and food webs model feeding relationships which exist between organisms within an ecosystem • organisms may adopt different strategies and lifestyles to survive, and there may be advantages and disadvantages of these *(eg solitary vs pack hunters)*
Structure and function			
Living things have special structures • living things have many special features (adaptations) *(eg fish have gills for breathing in the water, streamlined bodies for moving and scales to protect their bodies)* • many Australian organisms have unique features *(eg koalas have two 'thumbs' for climbing, and a pouch for their young)*	**Living things have structures and features that help them survive*** (Science) • living things have adaptations that help them survive *(eg camouflage in some animals, thorns, waxy leaves)* • plants and animals from around the world have particular features suited to the environment in which they live *(eg pandas eat bamboo; lions blend in with the savannah)*	**Organisms have structures and functions to enable life processes to occur** • obtaining nutrients is a life process *(eg some animals, like humans, have digestive systems; others, such as coral, absorb food directly from water)*	**Organisms have structures and functions for life and survival in the environment*** (Science) • organisms are made of cells and this forms the basis of all living things • some cells need to be replaced *(eg blood cells, skin cells)* • some cells perform specific functions *(eg red blood cells carry oxygen around the body; chloroplasts in leaves in plants carry out photosynthesis)*

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**National Consistency in Curriculum Outcomes, Statements of Learning*

Typical sequence of content:

Year 4 | **Year 5** | **Year 6** | **Year 7**

Structure and function (continued)

Year 7

- organisms have adaptations that enable them to survive in changing environments *(eg marine fish have special cells that detect salt levels and actively pump excess salt out of their bodies)*

Year 4

Living things are grouped according to their features

- living things can be classified according to their observable features *(eg fish, birds, reptiles)*
- animals and plants can be grouped in many ways *(eg by the type of food they eat: herbivore, carnivore or omnivore; by observable features such as flowers)*
- Australian marsupials all have a pouch *(eg kangaroo, koala)*

Year 5

Living things can be classified according to observable features* (Science)

- living things can be sorted into groups such as the five vertebrate groups: mammals, fish, reptiles, amphibians and birds, which are classified on features such as coverings
- despite having similar features, some animals may not necessarily be related *(eg birds, bats and mosquitoes all have wings but are not related)*

Year 6

Organisms are diverse and can be classified according to their features

- scientific classification of organisms can be based on their features *(eg the difference between flowering plants and trees in terms of root systems, stems and leaves)*
- organisms can have features that are used for classification that are not visible to the naked eye *(eg root hairs, scales on butterfly wings and pollen grains)*
- Australian plants and animals have particular features suited to the environment in which they live

Year 7

Living things can be classified according to their structural features* (Science)

- scientific groups for classification of living things *(eg eucalypts, mammals and amphibians)*
- classification systems allow us to compare the similarities and differences within a group *(eg mammals are comprised of three groups: placental, marsupial and monotremes; all are warm blooded but each has a different way of producing offspring)*

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**National Consistency in Curriculum Outcomes, Statements of Learning*

Typical sequence of content:

Year 4 → **Year 5** → **Year 6** → **Year 7**

Structure and function (continued)

Year 4	Year 5	Year 6	Year 7
Living things have life processes that can be varied	**All living things have a range of life processes**	**Organisms have a number of life processes or sequences**	**Organisms within a group carry out life processes in similar ways**
• all living things have a life process *(eg movement, nourishment, senses to locate food, growth, reproduction and drawing in oxygen)*	• different living things have different life processes *(eg nutrient intake: a humpback whale filters plankton, dolphins catch fish, seaweed uses sunlight to make 'food')*	• organisms have a number of life processes that support life and help them survive in their environment *(eg trees have leaves for making food and roots for absorbing nutrients)*	• organisms within a group carry out life processes in similar ways *(eg mammals feed milk to their young)*
• non-living things do not carry out life processes	• an organism's structure enables it to carry out life processes *(eg legs are used for walking; lungs are necessary for taking in air; a duck's webbed feet help it to swim and a plant's stem draws water and nutrients from the ground)*	• living things can have sequential processes that support life *(eg the sequence of processes and structures involved in the digestion of food, respiration or photosynthesis)*	• organisms in different groups often carry out life processes in different ways *(eg birds lay eggs, but most mammals give birth to live young)*
The environment can change	**Factors can impact on the environment of living things*** (Science/Civics & Citizenship)	**Factors that can impact on living things**	**Living things can respond to changes in the environment*** (Science/Civics & Citizenship)
• natural environmental changes *(eg seasons)*	• environmental changes can impact on living things *(eg the effect of a lack of available food; droughts and floods on crops and farms or rising sea temperatures causing coral bleaching)*	• effects of diseases, poisons, climate change and environmental conditions on organisms	• organisms respond to changes in the external environment *(eg changes in temperature, algal blooms caused by nutrient run-off into wetlands)* and the application of science to rectify some of these resulting problems
• human-influenced changes *(eg pollution, and habitat loss)*			

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**National Consistency in Curriculum Outcomes, Statements of Learning*

Typical sequence of content:

Year 4	Year 5	Year 6	Year 7
Reproduction and change			
Living things grow and reproduce • living things must reproduce in order to continue the species	**Living things have offspring that have many features of their parents*** (Science) • some living things can have identical features to their parents *(eg colours, wings and legs)*	**Living things can reproduce by one or two parents** • living things produced from one parent tend to be identical to the parent • living things produced from two parents can be different to the parents	**Reproductive processes pass parents' characteristics to their offspring** • characteristics of offspring can come from one or both parents *(eg eye or hair colour)* • sexual and asexual reproduction
Groups of living things have similar life cycles • life cycle of animals can be characterised by similar stages of development *(eg mammals like dogs)*	**Differences in life cycles can be compared*** (Science) • compare and contrast sequence of events in commonly known life cycles *(eg life cycles of flowering plants, insects)* • groups of living things can have similar life cycles	**Different organisms can have similar life cycles** • humans have a life cycle similar to other mammals, and can be characterised by similar stages of development and needs • some features of living things or organisms may change dramatically during maturation *(eg tadpoles develop into frogs)*	**Life cycles can be dependent on resources** • some animals reproduce in large numbers when there are bountiful food resources, but will reproduce in fewer numbers when there is less food *(eg kangaroos, locusts)*
Environmental changes affect life cycles of living things • factors such as weather can affect the life cycle of plants and animals *(eg drying up of wetlands)*	**Non-living factors that can affect life cycles** • limiting factors can affect the growth of plants *(eg the amount of sun, quality of water, presence of nutrients)*	**Consequences if life cycles are disrupted** • the effects on life cycles when disruptions occur *(eg reduced numbers of organisms)*	**Humans can control life cycles*** (Science) • different types of plant propagation *(eg cuttings, bulbs, runners)*

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**National Consistency in Curriculum Outcomes, Statements of Learning*

K-10 SCOPE & SEQUENCE

Typical sequence of content:

Year 4 — Year 5 — Year 6 — Year 7

Reproduction and change (continued)

Year 4	Year 5	Year 6	Year 7
			• control mechanisms *(eg control of mosquito larvae)* • limiting factors *(eg fertilisers, greenhouses)*
Living things have different adaptations suited to their environment • adaptations of living things help them survive *(eg camouflage)*	**Some animals have become threatened, or extinct*** (Science) • reasons why introduced species (feral animals) can impact on the continuation of a species *(eg bilbies and numbats being eaten by foxes and feral cats)* • how natural environmental changes can impact on living things *(eg frogs burrowing during drought, and locust plagues)* • changes in climate and habitat destruction can impact upon living things (organisms)	**Relationships that may hinder or help survival** • predator/prey, flocking behaviours • the impact of human-induced environmental change *(eg over-fertilising gardens or the overuse of vehicles)*	**Changes to biodiversity have causes and consequences*** (Science) • living things can adapt and change (adaptations) and the consequences of not adapting (extinction) • cooperation and competition between living things can promote change in populations • organisms which are better suited to their environment survive and pass on features to their offspring to help them survive • interactions of living things in the same environment can result in changes, which may cause some species to become dominant and others to disappear *(eg weeds, cane toads, locusts and feral animals)*