

Linking the Australian Curriculum with NRM Education resources

Biodiversity (Years 7-10)

Big ideas

Life on earth is extraordinarily diverse and complex. Biodiversity is the variety of life in all its forms, and is often considered at three levels:

- genetic diversity is the variety of genetic information contained in all the plants, animals and micro-organisms on earth
- species diversity is the variety of living organisms on earth
- ecosystems diversity relates to the variety of habitats, communities and ecological processes on earth (<http://www.environment.gov.au/sustainability/education/publications/conserving-australias-biological-diversity-teachers-notes>).

With the current population growth and continual expansion of human land use causing destruction to natural environments, biodiversity is threatened daily causing a loss of ecosystems and breaking fragile environmental relationships.

Overview

One of the challenges to biodiversity is the increasing human population, which increases demand for land. Increasing urbanisation and agriculture causes loss of habitat which is wiping out incredible numbers of plants, and threatens the basic needs of many animal species. Australia has a large variety of fragile ecosystems and environments all of which depend on a healthy biodiversity of plants and animals. The following are some of the sustainability biodiversity themes students can learn about and take action on:

- the critical role of ecosystem services (i.e. human impacts)
- the health of biodiversity in the school grounds and local area
- the change in vegetation profile in South Australia as a result of land clearance and land uses
- the increasing pressure on plants, animals and ecosystems, as a result of human land and resource use
- the importance of biodiversity and its interconnected relationships in a range of ecosystems
- improving biodiversity in the school grounds and/or local area (e.g. installing nest boxes, butterfly gardens)
- Australia's unique biodiversity
- the systemic relationships between air, water quality and biodiversity
- plant and habitat assessments of the school grounds (sampling of aquatic macro invertebrates, bird watching)
- the impact of biodiversity loss on indigenous people around the world
- the importance of genetic diversity
- genetic modification and the laws in South Australia
- climate change and biodiversity impacts for South Australia and/or the world



- animal rights
- the rights of rivers and forests e.g. Urewera forest in New Zealand: <http://www.ngaituhoe.iwi.nz/te-urewera-governance>
- humans, and other animals', reliance on biodiversity to provide the basics of life – food, water, shelter, clothing and clean air
- sustainable use within ecological limits
- the role of biodiversity in maintaining a healthy environment – to regulate our climate, decompose organic wastes, stabilise our soils, pollinate plants, and inspire our societies and cultures.

Sustainability in the Australian Curriculum

Education for sustainability develops the knowledge, skills, values and world views necessary for people to act in ways that contribute to more sustainable patterns of living. It enables individuals and communities to reflect on ways of interpreting and engaging with the world. Sustainability education is future-oriented, focusing on protecting environments and creating a more ecologically and socially just world through informed action. Actions that support more sustainable patterns of living require consideration of environmental, social, cultural and economic systems and their interdependence. (Source: The Australian Curriculum v7.2: <http://www.australiancurriculum.edu.au/CrossCurriculumPriorities/Sustainability>)

These are just a few Curriculum links and ideas that connect to NRM Education resources.

You are encouraged to seek further connections when planning learning experiences.

Learning areas	Strands	Learning experience ideas	NRM Education's resources
English Yr 7	Literature Literature and context Interpreting, analysing, evaluating	Researching Adelaide's past landscape via reading sheets (primary source material). Brainstorming ways of taking positive action to improve local biodiversity. <i>Critical and creating thinking, Ethical understanding, Literacy</i>	Unit of work: Improving biodiversity: Adelaide's biodiversity: past, present and future
	Literature Creating Texts	Based on research, write a narrative about the life of a frog, fish, macroinvertebrate, wetland or terrestrial bird, butterfly or bat. <i>Literacy, Personal and social capability</i>	Teacher information pack: Frogs Teacher information pack: Fish Teacher information pack: Macroinvertebrates Teacher information pack: Wetland birds Teacher information pack: Terrestrial birds Teacher information pack: Butterflies Teacher information pack: Bats
English Yr 8	Literature Literature and context	Researching Adelaide's past landscape via reading sheets (primary source material). Brainstorming ways of taking positive action to improve local biodiversity.	Unit of work: Improving biodiversity: Adelaide's biodiversity: past, present and future



	Interpreting, analysing, evaluating	<i>Critical and creative thinking, Ethical understanding, Literacy</i>	
Geography Yr 7	Geographical Knowledge and Understanding Unit 2: Place and livability	Learning about birds in the school grounds as an indicator of environmental quality and livability i.e. seeing their value as a 'bioindicator', an indicator of the health of a particular place or environment. <i>Critical and creative thinking, Personal and social capability</i>	Unit of work: Looking at habitat diversity through birds
		Students taking action as a result of their investigations: students suggest ways to improve local biodiversity in the school grounds based on their understandings of different types of birds and their habitat/feeding needs. <i>Critical and creative thinking, Personal and social capability</i>	Bird ID charts for the Adelaide Plains, Hills, Coast and Barossa regions
	Geographic Inquiry and Skills Collecting, recording, evaluating and representing	Conducting a school site investigation: learning to assess and monitor habitat quality in and around your school, as an indicator of environmental quality and livability. Activities include: mapping the school grounds; understanding why biodiversity is important; measuring tree health; understory vegetation; weediness; importance of leaf litter; surrounding vegetation connectivity; and photopoint monitoring. <i>Critical and creative thinking, Literacy, Numeracy, Personal and social capability</i>	Teacher information pack: Terrestrial habitat quality assessment
	Communication	Collecting a water sample. Educate the wider community and raise awareness of wider issues by sharing information about your monitoring site and water quality data. <i>Numeracy, Personal and social capability</i>	Teacher information pack: Freshwater quality monitoring
		Researching Adelaide's past landscape via reading sheets (primary source material). Brainstorming ways of taking positive action to improve local biodiversity. <i>Critical and creative thinking, Ethical understanding, Literacy</i>	Unit of work: Improving biodiversity: Adelaide's biodiversity; past, present and future
Geography Yr 10	Unit 1 Environmental change and management Geographic Inquiry and Skills Collecting, recording, evaluating and representing Communicating	Researching Adelaide's past landscape via reading sheets (primary source material). Brainstorming ways of taking positive action to improve local biodiversity. <i>Critical and creative thinking, Ethical understanding, Literacy</i>	Unit of work: Improving biodiversity: Adelaide's biodiversity; past, present and future



	Interpreting, analysing and concluding Reflecting and responding		
Science Yr 7	Science Understandings Biological sciences	Macroinvertebrates topic. Excursion to a freshwater site to sample and learn about aquatic macroinvertebrates. Collect a water sample and gather data. Investigate questions generated by water testing relating to species diversity and its links to water quality. Research the foods that different macroinvertebrates eat to create a possible food web. Are any of them more important to the health of the ecosystem? Create a classification key to assist identification. <i>Critical and creative thinking, Literacy, Numeracy</i>	Unit of work: Improving biodiversity: Looking at biodiversity through macroinvertebrates and water quality Aquatic macroinvertebrate ID chart Teacher information pack: Freshwater quality monitoring
	Science Inquiry Skills Planning and conducting Processing and analysing data and information	Construct a food web diagram for a species of frog; identify what makes frogs good bio-indicators; investigate a frog species. Students take action by designing a frog pond for their local context. <i>Critical and creative thinking, Numeracy</i>	Teacher information pack: Frogs
	Questioning and predicting Evaluating Communicating	Learn about local native plants (e.g. species; flowering times, pollination methods, ecosystems, ecosystem interconnections and role in beneficial plants, traditional uses etc). Design a native, biodiversity, habitat or butterfly garden concept plan. <i>Ethical understanding, Literacy</i>	
		Urban heat island (UHI) effect: the value of green spaces in urban environments. <i>Critical and creative thinking, Ethical understanding</i>	
Visual Arts	Science Inquiry Skills Planning and conducting Processing and analysing data and information Communicating	Sketch, draw, paint or create macros of birds, butterflies, frogs, fish or bats <i>Critical and creative thinking</i>	Teacher information pack: Frogs Teacher information pack: Fish Teacher information pack: Macroinvertebrates Teacher information pack: Wetland birds Teacher information pack: Terrestrial birds Teacher information pack: Butterflies Teacher information pack: Bats
Other resources	Identification charts	Aquatic macroinvertebrate Birds of the Adelaide Plains, Adelaide Hills, coast or Barossa region	



		Butterflies of the Adelaide region
	Teacher information packs	Macroinvertebrate (1.2mb pdf) Wetland birds (971kb pdf) Riparian habitat (1.45mb pdf) Terrestrial habitat (4.49mb pdf) Taking action for biodiversity teacher notes (3.85mb pdf) Nest boxes and hollow habitat assessment (3.55mb pdf)
	Fact sheets	Biodiversity teacher's notes (154kb pdf) Biodiversity resources (120kb pdf) How to plant local native plants (361kb pdf) Creating a wildlife friendly garden (3.98mb pdf) Attracting wildlife to your backyard Creating frog ponds (934kb pdf) Please note that the Department for Education and Child Development has a policy for creating ponds and wetlands 2013 Creature Feature articles (4.86mb pdf)

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