 Indigenous Education in Science

Indigenous perspectives

Warning – Aboriginal and Torres Strait Islander people are warned that this document and the following links may contain images, voices or names of deceased persons in photographs, film/video, audio recordings or printed material.

While the following links provide starting points, please contact your local AECG representatives for information about your local area.

Rock paintings (range from spraying of ochre to produce handprints to stick figures in NT) (BIO Mod 4):

* [Pigments and palettes from the past – science of Indigenous art](https://theconversation.com/pigments-and-palettes-from-the-past-science-of-indigenous-art-35604)
* [Ochre pigments and paint](http://www.aboriginalartonline.com/methods/methods.php#ochre)
* [First Footprints](http://www.abc.net.au/tv/programs/first-footprints/) (ABC)
* Western region NSW/Broken Hill
  + [The Journey So Far – Mutawintji Local Aboriginal Land Council](https://www.youtube.com/watch?v=RUcoemVhaLo)
  + [An Aboriginal Elder talks about the cave paintings in Mutawintji National Park](https://www.youtube.com/watch?v=mgcIA4Dl3jM)
  + [Mutawintji Artwork](https://www.youtube.com/watch?v=wQ8jJFwTm_g)
* Sydney – Eora Nation
  + [Hidden in plain sight: Indigenous Australian rock art on Sydney’s doorstep](https://www.theguardian.com/travel/2015/jul/23/hidden-in-plain-sight-indigenous-australian-rock-art-on-sydneys-doorstep)
  + [Aboriginal rock art discovered on Sydney’s northern beaches a major ancient archaeological find](https://www.dailytelegraph.com.au/news/nsw/aboriginal-rock-art-discovered-on-sydneys-northern-beaches-a-major-ancient-archaeological-find/news-story/9567be496387a0b94726a7cdead7c5ba)
* Cultural sites (such as rock/cave paintings in NSW)
  + [Discover Aboriginal culture in NSW national parks](http://www.nationalparks.nsw.gov.au/conservation-and-heritage/discover-aboriginal-culture)
  + [Researchers uncover chemistry behind ancient Indigenous art](http://newsroom.uts.edu.au/news/2014/09/researchers-uncover-chemistry-behind-ancient-indigenous-art)

Land management and ecosystem management (BIO Mod 4, INV Mod 4, EES Mod 7):

* [PM's native title fix for Adani mine](http://www.theaustralian.com.au/national-affairs/adani-chttp:/www.theaustralian.com.au/national-affairs/adani-coal-mine-malcolm-turnbull-moves-to-change-native-title-laws/news-story/a9c176fc41a7af1363dca77ef23271b4)
* Gammage, Bill. The Biggest Estate on Earth: How Aborigines Made Australia. Allen and Unwin, 2011.
  + [The Biggest Estate](https://www.youtube.com/watch?v=CnZJYMu5Dw8)
* Pascoe, Bruce. Dark Emu: Black Seeds Agriculture or Accident? Magabala Books, 2014.
  + [Teacher Notes: Dark Emu](https://www.magabala.com/media/wysiwyg/DarkEmu_picture_X.pdf)
* [Arnhem Land rangers blending traditional and high-tech methods to earn carbon credits](http://www.abc.net.au/news/2017-09-10/aboriginal-rangers-using-fire-to-create-carbon-credits/8742550)
* Understanding of totems/roles and rites associated with totems (care for totem animals and plants allowed for the maintenance of biodiversity and reduced the possibility of extinction of species)
  + [Birth ceremonies, totems and rites in Aboriginal society](https://www.qcaa.qld.edu.au/downloads/approach2/indigenous_res012_0804.pdf)
  + [Aboriginal Totems](http://www.envirostories.com.au/wp-content/uploads/2014TTT/Totems/ES2014-CTLLS-Totems-WEB.pdf)
  + [2014 Tools Totems Tucker: Exploring Aboriginal Culture](http://centraltablelands.lls.nsw.gov.au/__data/assets/pdf_file/0007/588796/2014-tools-totem-tucker-education-kit.pdf)
  + [Totems (Kamilaroi – A Nation’s Identity)](https://kamilaroianationsidentity.weebly.com/totems.html)
* Aboriginal land management for biodiversity
  + [Land Alive](http://www.environment.nsw.gov.au/landalive/index.htm)
  + [Teacher resources for environment and heritage](http://www.environment.nsw.gov.au/education-resources/teacher-resources) (NSW Office of Environment and Heritage)
* Fire stick farming
  + [Gammage: Prevent bushfire the Aboriginal way](http://www.abc.net.au/local/audio/2012/05/28/3512963.htm)
  + See related stories on firestick ecology on ABC website
  + [Bill Gammage discusses ‘The Biggest Estate on Earth’](https://www.youtube.com/watch?v=Sko-YDIULKY)
  + [Firesticks: Jervis Bay, New South Wales](https://www.youtube.com/watch?v=vVFVmkzi82g)
  + [Firestick farming in NSW](http://www.firesticks.org.au/)
  + [Through Our Eyes – Using Fire To Care For Country with Roy Barker](https://www.youtube.com/watch?v=-e2CoHrNk1c) (Lightning Ridge, Western region)
  + [Science and ancient fire knowledge](http://splash.abc.net.au/home#!/media/29925/management-of-the-northern-savanna)
* Taking only what food is needed at the time (so less selection pressure on the ecosystem) and using seasonal calendars (important in determining when you can and can’t harvest animal eggs, plants and animals)
  + Bodkin, Frances and Robertson, Lorraine. D’harawal Climate and Natural Resources. Sussex Inlet, NSW: Envirobook, 2013.
  + [Book review: D’harawal](http://www.asc.asn.au/blog/2015/04/02/book-review-dharawal/)
  + [Yawuru calendar](http://www.bom.gov.au/iwk/calendars/yawuru.shtml)
  + [D’harawal calendar](http://www.bom.gov.au/iwk/dharawal/index.shtml)
  + [Banbai calendar](http://www.bom.gov.au/iwk/calendars/banbai.shtml)
* Other resources include:
  + [Through Our Eyes – The Project](https://www.youtube.com/watch?v=4PK0tL4W55M&list=PL5Oe_wGmcw4v-oggEKWfOTlCpIsHoJsRV) (series 1)
  + [Through Our Eyes – Welcome to Mutawintji with Mark Sutton](https://www.youtube.com/watch?v=LY0PWp7tn0Y&list=PL5Oe_wGmcw4ulvkmZ897I9jC-wSlK2j_E) (series 2)
  + [Local Aboriginal History and Culture: A Teacher’s Resource](http://brettrolfe.com/wp-content/uploads/2012/01/mteach_Dharawal-Resource.pdf) (D’harawal – also see associated links in document)
  + [Aboriginal land management and care – Traditional care for the land](https://www.creativespirits.info/aboriginalculture/land/aboriginal-land-care#toc1)

Mining (BIO Mod 4, EES Mod 1, EES Mod 8):

* [Mining by Aborigines – Australia’s first miners](http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0008/109817/mining-by-aborigines.pdf)
* Mining sites
  + [Uranium Mining](http://www.mirarr.net/uranium-mining) (NT – Kakadu)
  + [East Arnhem Land Project](https://www.south32.net/docs/default-source/gemco/2016-east-arnhem-land-project-mmp.pdf?sfvrsn=1a4366fe_3) (NT – Arnhem Land)
  + [Separate but unequal: the sad fate of Aboriginal heritage in Western Australia](https://theconversation.com/separate-but-unequal-the-sad-fate-of-aboriginal-heritage-in-western-australia-51561) (WA – possible stimulus material)
* Managing mining sites across Australia
  + [Mine rehabilitation in the Australian minerals industry](http://www.minerals.org.au/file_upload/files/reports/Mine_rehabilitation_in_the_Australian_minerals_industry_FINAL.pdf) (Pilbara native land rehabilitation using native grasses)
  + [ARC Centre for Mine Site Restoration](http://arc-cmsr.org/index.php/en/) (possible depth study)
  + [Mine Rehabilitation in Australia](https://www.austminerehab.com/)
  + [Pilbara hopes to sow profitable future from collection of native wildflower seeds](http://www.abc.net.au/news/rural/2014-10-17/pilbara-seed-collection/5821478) (Pilbara, WA)

Bush medicines (BIO Mod 7, CH Mod 3, INV Mod 6):

* Bush medicine plants
  + [Aboriginal Bush Medicine](https://www.anbg.gov.au/gardens/education/programs/pdfs/aboriginal-bush-medicines.pdf)
  + [Aboriginal Plant Use and Technology](https://www.anbg.gov.au/gardens/education/programs/pdfs/aboriginal_plant_use_and_technology.pdf)
  + [Aboriginal Use of Wattles](https://www.anbg.gov.au/gardens/education/programs/pdfs/aboriginal-use-of-wattles.pdf)
  + [Aboriginal Plant Use Trail](http://www.anbg.gov.au/gardens/visiting/exploring/aboriginal-trail/index.html)
  + [Wiradjuri Plant Use in the Murrumbidgee Catchment](http://archive.lls.nsw.gov.au/__data/assets/pdf_file/0009/495261/archive-wiradjuri-plant-use.pdf)
  + [Growing a healthy future with traditional Aboriginal foods](http://www.abc.net.au/news/rural/2016-06-22/growing-a-health-future-with-traditional-aboriginal-foods/7533204)
  + [Fact Sheet: Bush Medicine](http://www.wettropics.gov.au/site/user-assets/docs/bushmedicine.pdf)
  + [Aboriginal Plant Use in south-eastern Australia](https://parksaustralia.gov.au/botanic-gardens/pub/aboriginal-plantuse.pdf)
  + [Rainforest fruit power](http://www.abc.net.au/science/articles/2009/04/30/2557398.htm)
  + [Traditional Bush Medicine of the Darug People](http://acms.sl.nsw.gov.au/_findingaid/2011/D13979/a5132001.pdf)
  + [Plant uses and medicines near Woorabinda with Steve Kemp](https://www.youtube.com/watch?v=pQ8QiqZ3k8E) (Fitzroy Basin)
  + [Walabunnba calendar](http://www.bom.gov.au/iwk/walabunnba/index.shtml)
  + [SANDTRAKS: Salt Water and Sand Tracks](http://www.sandtraks.com.au/salt-water-sand-tracks/)
* Tea tree
  + [Aboriginal Plant Use in south-eastern Australia](https://parksaustralia.gov.au/botanic-gardens/pub/aboriginal-plantuse.pdf)
  + [Tea Tree: One of Australia’s Oldest Bush Medicines](http://teatreemelaleuca.com.au/tea-tree/)
* Wattle
  + [Aboriginal Use of Wattles](https://www.anbg.gov.au/gardens/education/programs/pdfs/aboriginal-use-of-wattles.pdf)
  + [Traditional Uses of Australian Acacias](http://www.wattleday.asn.au/about-wattles/aboriginal-and-torres-strait-islander-knowledge-and-culture/practical-uses)
* Smokebush
  + [Aboriginal Plant Use Trail](http://www.anbg.gov.au/gardens/visiting/exploring/aboriginal-trail/index.html)
  + [Aboriginal Bush Medicine](https://www.anbg.gov.au/gardens/education/programs/pdfs/aboriginal-bush-medicines.pdf)
* Books:
  + Isaacs, Jennifer. Bush Food: Aboriginal Food and Herbal Medicine. Sydney: New Holland Publishers, 2002.
  + Rankmore, Terry. Bush Medicine Plants of the Illawarra. Landcare Illawarra, 2013.
  + [Bush Tucker And Bush Medicine](http://www.landcareillawarra.org.au/bush-tucker-and-bush-medicine/)
  + McKemey, Michelle and White, Harry. Bush Tucker, Boomerangs and Bandages: Traditional Aboriginal Plant Use in the Border Rivers and Gwydir Catchment. Inverell, NSW: Border Rivers-Gwydir Catchment Management Authority, 2011.
  + [Bush Tucker, Boomerangs and Bandages: Traditional Aboriginal Plant Use in the Border Rivers and Gwydir Catchment](http://myallcreektoreconciliation.weebly.com/uploads/5/1/0/3/51038855/archive-bush-tucker-boomerangs-and-bandages.pdf)
  + Hansen, Vivienne and Horsfall, John. Noongar Bush Medicine: Medicinal Plants of the South-west of Western Australia.
* Detoxifying bush foods
  + [Aboriginal people, bush foods knowledge and products from central Australia: Ethical guidelines for commercial bush food research, industry and enterprises](http://www.nintione.com.au/resource/NintiOneResearchReport_71_BushFoodGuidelines.pdf)
  + [Aboriginal Bush Medicine](https://www.anbg.gov.au/gardens/education/programs/pdfs/aboriginal-bush-medicines.pdf)
  + [Indigenous preparation of Djitama (bush yam)](https://www.youtube.com/watch?v=2wgeBcWXMo0)
  + [Aboriginal Plant Use Trail](http://www.anbg.gov.au/gardens/visiting/exploring/aboriginal-trail/index.html)
  + [Fact Sheet: Bush Foods](http://www.qm.qld.gov.au/~/media/Documents/Learning+resources/QM/Resources/Fact+Sheets/fact-sheet-bush-foods.pdf)
* Cycads
  + [The Cycad Pages](http://plantnet.rbgsyd.nsw.gov.au/PlantNet/cycad/)
* Potential drug treatments
  + [Medicinal Plants of the Australian Aboriginal Dharawal People Exhibiting Anti-Inflammatory Activity](https://www.hindawi.com/journals/ecam/2016/2935403/abs/)
  + [Indigenous smoking ritual an effective treatment for skin infections](http://www.aginnovators.org.au/news/indigenous-smoking-ritual-effective-treatment-skin-infections)

Acid/base chemistry (CH Mod 6):

* [Pigments and palettes from the past – science of Indigenous art](https://theconversation.com/pigments-and-palettes-from-the-past-science-of-indigenous-art-35604)
* [Looking up and looking down: pigment chemistry as a chronological marker in the Sydney Basin rock art assemblage, Australia](https://research-repository.griffith.edu.au/bitstream/handle/10072/339702/HuntleyPUB2672.pdf?sequence=1)
* [Traditional Aboriginal Preparation Alters the Chemical Profile of Carica papaya Leaves and Impacts on Cytotoxicity towards Human Squamous Cell Carcinoma](http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0147956)
* Use of charcoal
* Coastal pigfaces
* Bush medicines – neutralisation
* [Food Safety of Australian Plant Bushfoods](file:///C:\Users\HLY3\Downloads\01-028.pdf)

Water (INV Mod 1):

* [Crookhat and the Kulunada](https://www.roninfilms.com.au/get/files/4587.pdf) (2010 documentary, 23min, CAAMA Productions)
* [Putuparri and the Rainmakers](http://putuparriandtherainmakers.com/wp-content/uploads/2015/09/Putuparri-Study-Guide-v2_compressed.pdf) (2015 documentary, 1h 37min)
* [Indigenous Peoples and Water](https://www.humanrights.gov.au/sites/default/files/content/social_justice/nt_report/ntreport08/pdf/chap6.pdf)
* Germein, Katrina. Big Rain Coming. Penguin Australia, 2002.
* [SANDTRAKS: Tribal Tucker](http://www.sandtraks.com.au/tribal-tucker/)

Biases that may have affected scientific thinking (INV Mod 1):

* A few resources available in the desert (including water):
  + [Eight Ladies](https://www.roninfilms.com.au/feature/4581/eight-ladies-from-caama-collection.html) (CAAMA Collection)
  + [Putuparri and the Rainmakers](http://putuparriandtherainmakers.com/wp-content/uploads/2015/09/Putuparri-Study-Guide-v2_compressed.pdf)
  + [Aboriginal water values and management in northern Australia](https://www.youtube.com/watch?v=XMKYybtUJ-o) (CSIRO)
* [Western science and Aboriginal people](http://www.sydneybarani.com.au/sites/western-science-and-aboriginal-people/)
* Food – understanding of taking and cooking only what is needed
  + [Eight Ladies](https://www.roninfilms.com.au/feature/4581/eight-ladies-from-caama-collection.html) (CAAMA Collection)
  + National Museum Australia – Possum skin cloak
  + [AIATSIS Collections](http://aiatsis.gov.au/collections/collections-online) – See ‘A Possum Skin Cloak’ and ‘Living Off Our Waters’
* Agriculture – mass production, storage vs only what you need, maintained your environment, for example, Macarthur in Camden – colonial farming, clearing and fencing
  + [Dark Emu argues against ‘Hunter Gatherer’ history of Indigenous Australians](https://www.anbg.gov.au/gardens/education/programs/pdfs/aboriginal-bush-medicines.pdf)

Regulation of scientific research and protection of Indigenous cultural and intellectual property (INV Mod 8):

* [Indigenous Peoples and Intellectual Property Rights](https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/RP9697/97rp20)
* For an understanding of Country
  + [Kanyini](https://www.youtube.com/results?search_query=kanyini) (YouTube)
  + Randall, Bob and Hogan, Melanie. Nyuntu Ninti (What You Should Know). ABC Books, 2011.
  + [Nyuntu Ninti: Teacher Notes](http://static.harpercollins.com/harperimages/ommoverride/NYUNTU_NINTI_teacher_notes.pdf)
  + [You Are Here](https://www.sbs.com.au/learn/you-are-here) (SBS)
  + [Twelve Canoes](http://www.12canoes.com.au/)
  + [People, place, language and song – Connecting](http://globalwords.edu.au/units/Indigenous_UPY5_html/pop02.html)
  + Murphy, Joy and Kennedy, Lisa. Welcome to Country. Walker Books Australia, 2016.
* Mining on sacred sites
  + [Aboriginal elders speak out in support of heritage protection on proposed Shenhua mine site](http://www.abc.net.au/news/2016-11-04/emotional-consultation-aboriginal-heritage-shenhua-mine/7996884) (part of an ongoing series of news reports on the issues)
  + [PM's native title fix for Adani mine](http://www.theaustralian.com.au/national-affairs/adani-chttp:/www.theaustralian.com.au/national-affairs/adani-coal-mine-malcolm-turnbull-moves-to-change-native-title-laws/news-story/a9c176fc41a7af1363dca77ef23271b4)
* Discussion of Uluru
* [Encounters](http://www.nma.gov.au/exhibitions/encounters) (an exhibition of ATSI artefacts from the British Museum)
  + Gimuy Walabura Yidinji Elder Henrietta Marrie talks about what it means to have objects taken from her traditional lands return to Australia for the Encounters exhibition
* Use traditional medicines
* Perceptions about diet – eating bush foods, for example, kangaroo available now in supermarkets

Rocks and minerals used by ATSI peoples and traditional quarrying and mining methods (EES Mod 1):

* [Mining by Aborigines – Australia’s first miners](http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0008/109817/mining-by-aborigines.pdf)
* Flood, Josephine. Archaeology of the Dreamtime. Sydney: Collins, 1983.
* [Aboriginal Uses of Rocks](http://www.adderley.net.au/geology/exhibition/07/07_01.html#03)
* [Aboriginal Use of Rocks and Minerals](https://museumsvictoria.com.au/website/melbournemuseum/discoverycentre/dynamic-earth/videos/aboriginal-use-of-rocks-and-minerals/index.html) (Melbourne Museum)

Different views about the value of and/or harm caused by introduced species (EES Mod 4):

* Farming, clearing and removing native vegetation – introduction of rabbits (which became a food source)
  + [Rabbits – fact sheet](http://www.environment.nsw.gov.au/pestsweeds/RabbitFactsheet.htm)
  + [Rabbits introduced](http://www.nma.gov.au/online_features/defining_moments/featured/rabbits_introduced)

Managing Australia’s natural resources (EED Mod 8):

* [Module Three: Land Information – Managing Indigenous Pastoral Lands](https://rirdc.infoservices.com.au/downloads/14-019)
* [Aboriginal elders speak out in support of heritage protection on proposed Shenhua mine site](http://www.abc.net.au/news/2016-11-04/emotional-consultation-aboriginal-heritage-shenhua-mine/7996884) (ongoing)
* [Kakadu National Park: Management Plan 2016-2026](https://www.environment.gov.au/system/files/resources/1f88c5a3-409c-4ed9-9129-ea0aaddd4f33/files/kakadu-management-plan-2016-2026.pdf)
* WA mine examples:
  + [Argyle Mine – Participation Agreement](http://www.gelganyem.com.au/index.php/gelganyem/our-agreement-gelganyem.html)
  + [Carey Mining](http://www.careymining.com.au/)
  + [Western Australia: information on engaging with traditional owners](https://www.austrade.gov.au/land-tenure/Engagement-guide/western-australia-information-on-engaging-with-traditional-owners)
* Rock art
  + [Why Australia’s Aboriginal rock art will disappear](https://www.creativespirits.info/aboriginalculture/arts/why-australias-aboriginal-rock-art-will-disappear)
* Aboriginal scar trees
  + [Rare Aboriginal ‘scar tree’ discovered on Hunter Valley farm](http://www.abc.net.au/news/2016-08-25/rare-aboriginal-scar-tree-discovered-on-hunter-valley-farm/7783742)
  + [Botanist has discovered a 350 year old tree with a significant scar from indigenous people of the past](https://www.dailytelegraph.com.au/newslocal/fairfield-advance/botanist-has-discovered-a-350-year-old-tree-with-a-significant-scar-from-indigenous-people-of-the-past/news-story/807bbbdc251a3d3dcd3e6a23bf80e9ee)
  + [Aboriginal scarred trees in NSW – a field manual](http://www.environment.nsw.gov.au/conservation/AboriginalScarredTrees.htm)

Other general resources:

* [Aboriginal Education](http://det.wa.edu.au/aboriginaleducation/apac/detcms/navigation/general-resources/) (Department of Education WA)
* [Indigi Lab](http://www.indigilab.com.au/)
* National Museum Australia’s [Classroom Resources](http://www.nma.gov.au/education/resources)
* AIATSIS [Educational Resources](https://aiatsis.gov.au/aboriginal-studies-press/educational-resources)
* [Indigenous Science Education](http://www.abc.net.au/catalyst/stories/3576726.htm)
* [Teacher resources to match the Australian cross-curriculum priorities](https://www.creativespirits.info/aboriginalculture/lesson-teacher-resources-to-match-the-australian-curriculum#axzz4pEsYGVI6) (Creative Spirits)
* [The Anthropological Society of Australasia Survey](http://dxlab.sl.nsw.gov.au/weemala/)