

Environments past and present: Management of Australian environments

Strand

Time, Continuity and Change

Place and Space

Culture and Identity

Systems, Resources and Power

Core learning outcomes

Time, Continuity and Change

TCC 3.3 Students use knowledge of people's contributions in Australia's past to cooperatively develop visions of preferred futures.

TCC 3.4 Students organise information about the causes and effects of specific historical events.

TCC 3.5 Students describe various perspectives based on the experiences of past and present Australians of diverse cultural backgrounds.

Place and Space

PS 3.1 Students compare how diverse groups have used and managed natural resources in different environments.

Culture and Identity

CI 3.4 Students communicate an awareness of change within Aboriginal cultures and Torres Strait Islander cultures.

Systems, Resources and Power

SRP 3.1 Students make inferences about interactions between people and natural cycles, including the water cycle.

Purpose and overview

Activities aim to develop students' understanding of interactions between people and natural cycles including the water cycle. Students compare how groups from before colonial times to the present day used and managed natural resources in Australia. These Indigenous and European perspectives about the environment are explored to develop understandings about the effects of resource use on both cultures and the environment, past, present and future. Students investigate people's contributions to environmental management to develop visions of preferred environmental futures.

The activities are designed to promote investigative learning, in particular, to engage students in exploring and reflecting on different perspectives relating to the use of environments. The activities are sequenced in phases using the TELSTAR inquiry model, as outlined in the overview table. Teachers may wish to make the phases of this model of inquiry explicit to students.



Phases	Activities	Core learning outcomes	Assessment opportunities
1. Tuning in to the topic	1. Finding your other half	PS 3.1	
2. Exploring the proposed inquiry	2. THINK, WINK, Decide	PS 3.1	
3. Looking for information	3. Looking at perspectives about the land 4. Understanding natural cycles 5. Looking at colonial resource use 6. Looking at the impact of introduced species on environments	TCC 3.5 PS 3.1 SRP 3.1 TCC 3.4	Attitude match: Students sort and record the different attitudes toward the Australian environment held by Aboriginal people and British colonists. Presentation (oral, visual, poster): Students briefly describe the way Aboriginal people understood seasonal cycles. Concept map: Students use a concept map to describe the relationship between British colonists and the natural environment. Consequence chart: Students jointly complete a consequence chart on the impact of introduced species in Australia.
4. Sorting information	7. Charting consequences for environments 8. Charting consequences for Aboriginal people	TCC 3.4 CI 3.4	Consequence chart: Students complete a consequence chart on the impact of European occupation of Australia on the environment. Artistic expression: Students artistically show the impact of environmental change on Aboriginal people of the past.
5. Testing ideas	9. Researching the state of the environment in Australia today 10. Understanding the environment helps	TCC 3.4 PS 3.1 SRP 3.1 SRP 3.1	Retrieval chart: Students complete a retrieval chart identifying the origins of current environmental issues and present status of these issues, and reflect on ways to manage them. Cause–effect table: Students list ways that people affect the water cycle.
6. Taking action	11. Designing a sustainable future 12. Developing a personal or class action plan	TCC 3.3 TCC 3.3	Future scenario: Students describe and illustrate their preferred environmental future. Action plan: Students develop an action plan that will contribute to their preferred future.
7. Reflecting on what has been learnt	13. Creating learning maps	TCC 3.3 TCC 3.4 TCC 3.5 PS 3.1 CI 3.4 SRP 3.1	Student–teacher conferencing: Students story maps and ‘THINK, WINK, Decide’ booklets may provide further evidence of demonstrations of learning outcomes associated with this module.

Source: Adapted from Queensland Department of Education 1989, *The Social Education Framework: P–10*, Brisbane, p. 5 and Queensland Department of Education 1989, *Social Investigators: An Approach to Active and Informed Citizenship for Years 8–10*, Brisbane.

Assessment

The assessment opportunities outlined are examples of how to assess students' demonstrations of the identified learning outcomes. As often as possible, negotiate assessment with students and support a variety of ways of demonstrating the outcomes. Reflect with students on evidence gathered when making judgments about their demonstrations of learning outcomes. Some students may require more time and/or other contexts in which to demonstrate these learning outcomes. Other modules may provide such time and/or contexts and the 'Levels 1 to 6 module learning outcomes maps' in the *Years 1 to 10 Studies of Society and Environment Sourcebook Guidelines* can be used to identify these modules.

Assessing outcomes at different levels

Activities in this module are designed primarily for students working towards demonstrations of Level 3 outcomes. Assessment opportunities may need to be modified or created to enable students to demonstrate the *know* and *do* of core learning outcomes before or after this level. Possible relevant learning outcomes are:

- Level 2: TCC 2.3, TCC 2.4, TCC 2.5; PS 2.1, PS 2.2, PS 2.5; CI 2.4; SRP 2.1
- Level 3: PS 3.2, PS 3.3, PS 3.5; SRP 3.2
- Level 4: TCC 4.3, TCC 4.4, TCC 4.5; PS 4.1, PS 4.2; CI 4.4; SRP 4.1

Using this module

The activities of this module promote the Studies of Society and Environment values of ecological and economic sustainability and peace.

Aboriginal studies

Indigenous groups in Australia include Aboriginal people and Torres Strait Islander people. There is diversity between and among these groups. Torres Strait Islander people have different cultures and histories to mainland Aboriginal people. This module focuses on how some Aboriginal people used the natural environment.

Teaching and learning in Aboriginal studies recognises that Aboriginal society existed in Australia prior to the arrival of European colonisers, invaders, explorers, convicts and settlers. It provides another view of people and events that were previously largely portrayed from the perspective of non-Aboriginal people. This module recognises the important relationship between Aboriginal people and their land. It is clear that Aboriginal people knew a great deal about the resources of the land. To improve their wellbeing they modified the environment without damaging it. But, more than this, they had a deep emotional and spiritual attachment to their land. Aboriginal people retain knowledge of, and connection to, their land today.

Teaching and learning in Aboriginal studies promotes respect and reconciliation between Aboriginal and non-Aboriginal people. It confirms that Australia has an Aboriginal history and that the study of Aboriginal people should be viewed in traditional and contemporary contexts and environments.

Aboriginal and Torres Strait Islander Human Resources Protocols

When accessing the human resources of Aboriginal communities and Torres Strait Island communities, it is important to follow protocols. These are detailed in the *Aboriginal and Torres Strait Islander Human Resources Protocols* on the Equity page of the Queensland School Curriculum Council website (www.qsc.c.qld.edu.au).

Environmental education

Teaching and learning in environmental education focuses on ways to create and sustain healthy environments. It recognises that the natural environment has been damaged and is continuing to be damaged. Environmental education aims to help students develop the skills, knowledge and attitudes they need to care for the planet. As environmental problems do not stop at country or state borders, government, business, industry and the community need to work together to find solutions to the many environmental problems we face.

According to the State of the Environment Report (Department of Environment, Sport and Territories 1996) Australia's alarming loss of biodiversity is perhaps one of this country's most urgent environmental issues. This is linked to land clearing and other damaging land-management practices, which together are causing deterioration in the quality of soil and water. These problems began with the arrival of the First Fleet and have continued for 200 years. The British had little or no understanding of their new environment when they came to Australia. They could not know of the great variability in climate, the low nutrient status of some of the land and the importance of fire in land management. They were primarily interested in survival. They tried to use their agricultural practices and species (plant and animal) in an environment that could not sustain them. As a result, Australia has the world's highest rate of mammalian extinction. Overgrazing has destroyed vast tracts of land, and clearing of deep-rooted native trees for agriculture has caused the watertable to rise, bringing salts close to the surface and killing crops.

There is a need to continue to develop new land-management techniques that combine the best of today's technologies with the techniques of Aboriginal people to maintain land sustainably. Many people are working together to care for the land to ensure a sustainable future. Some farmers are replacing monocultures with integrated cropping and practising organic farming techniques and permaculture. People in communities all over Australia are revegetating damaged land with native species. Others are working to reduce energy consumption by choosing green energy options for their homes and businesses.

Environmental education encourages people to work together to re-create a healthy environment. While large-scale change is necessary, there are many 'little' things that can be done every day to care for environments at home, school and in communities.

Background information

Terminology

Students will need to understand these terms in the context of the activities in this module:

Aboriginal people	ecology	Indigenous	predators
agriculture	environment	introduced	resources
British people	endangered	land clearing	settlement
collection	European	livestock	sources
colonial/colonists	evaporation	nature	species
condensation	event	natural resources	squatter
conflict	exotic	occupation	sustainable
consequences	feral	perspectives	
contact	future	precipitation	

It is necessary to use appropriate language when communicating about Aboriginal peoples and cultures. Many terms can be value laden, especially those used in the context of a particular period of time. Some are no longer used because they connote insults, ignore perspectives and evoke racist attitudes and values.

An examination of past attitudes, events, practices and policies guides teachers and students to refer to people and their histories with respect and to challenge myths and misconceptions.

Within the broader vision of reconciliation and a commitment to strengthening relations between Aboriginal and non-Aboriginal people, the use of appropriate terminology reflects an understanding of the need to show respect and act in a culturally sensitive and informed manner.

School authority policies

Be aware of and observe school authority policies that may be relevant to this module. The following documents highlight the importance of Aboriginal studies and environmental education for all students:

Australian Aboriginal Studies and Torres Strait Islander Studies Project 1995, *National Principles and Guidelines for Aboriginal Studies and Torres Strait Islander Studies: K–12*, Curriculum Corporation, Melbourne.

Queensland Department of Education 1994, 'Curriculum and Studies – CS 17: Anti-Racism Policy', *Department of Education Manual*, Brisbane.

Queensland Department of Education 1993, *Environmental Education P–12 Guidelines*, Brisbane.

Queensland Department of Education 1995, *The Teaching of Aboriginal Studies and Torres Strait Islander Studies in Queensland Schools: Draft Preschool to Year 12 Guidelines and Framework*, Brisbane.

Equity considerations

Activities in this module take place in a supportive environment. They provide opportunities for students to increase their understanding and appreciation of equity through valuing diversity and challenging inequities. Activities encourage students to:

- demonstrate understanding and awareness of cultural diversity
- understand and appreciate the diversity between and among groups
- show respect for and consideration of attitudes, values and beliefs that are different to their own
- recognise that everyone has rights and that every person must take responsibility for himself or herself and others
- understand and appreciate that individuals and groups have different perspectives about events, places and phenomena.

Some students with disabilities may need assistance for activities within this module. Advice should be sought from their support teachers. It is important that these equity considerations inform decision making about teaching strategies, classroom organisation and assessment.

Links

Studies of Society and Environment

This module is one of a suite of modules for Levels 1 to 6. See the Queensland School Curriculum Council website (www.qscc.qld.edu.au) for more information.

This module has conceptual and process links to the following modules:

- Level 3: Australia circa 1788
- Level 3: Past and future study
- Level 4: Australian resource management
- Level 4: Indigenous communities and rapid change.

Other key learning areas

The activities in this module offer opportunities for cross-key learning area planning. However, it is important that the integrity of the processes and concepts within key learning areas is not compromised.

Possible links to *Science*:

- EB 3.1 Students identify and describe some interactions (including weathering and erosion) that occur within systems on Earth and beyond.
- EB 3.3 Students collect information which describes ways in which living things use the Earth and the sun as resources.
- LL 3.3 Students describe some interactions (including feeding relationships) between living things and between living and non-living parts of the environment.

The activities of this module also relate to learning outcomes for *English* and *The Arts*. For more information visit www.qscc.qld.edu.au.

Evaluation of a unit of work

After completion of units of work developed from this module, collect information and make judgments about:

- teaching strategies and activities used to progress student learning towards demonstrations of core learning outcomes and in the cross-curricular priorities
- opportunities provided to gather evidence about student's demonstrations of core learning outcomes
- future learning opportunities for students who have not yet demonstrated the core learning outcomes
- the extent to which activities matched needs of particular groups of students and reflected equity considerations
- the appropriateness of the time allocations for particular activities
- the appropriateness of the resources used.

Information from this evaluation process can be used to plan subsequent units of work so that they build on, and support, student learning. The evaluated units of work may also be adapted prior to their reuse. For further information, refer to the 'Curriculum evaluation' section in the sourcebook guidelines.

Activities

Phase 1 Tuning in to the topic

Core learning outcomes emphasis: PS 3.1

Students test and reflect on their knowledge of how Australia's natural environment has been treated over time.

Activity 1 Finding your other half

Resource 1

Teaching considerations

Divide the class into two groups before you begin the activity. Make two copies of Resource 1 on card (two different colours) and cut up into individual cards. Part 1 of Resource 1 contains the beginnings of seven statements and part 2 contains the ends of the seven statements. The activity is designed to stimulate interest that can be documented in Activity 2 'THINK, WINK, Decide'. Students will need a folder in which to keep information collected throughout the module. Encourage students to start collecting articles about environmental issues in Australia including positive projects and outcomes. The articles can be kept in their folders to display and keep until they begin researching Australian environmental issues in later phases.

Resource 1

Students, each with part of a statement from Resource 1, move around the classroom to find the student who has the other part of the statement. When students find their 'other half' they sit down and share their responses to the statement — for example, Are they surprised by the statement? Do they believe it? Pairs share their whole statement with another pair.

Resource 2

In turn, pairs read their statement to the class and share their responses. Facilitate this discussion and share information from Resource 2 when appropriate.

Phase 2 Exploring the proposed inquiry

Core learning outcomes emphasis: PS 3.1

Students consider the issues they would like to investigate and record them for later reference.

Activity 2 THINK, WINK, Decide

Explain to students that they will be investigating how some Australian environments were used and valued in the past. Explain that students will be able to do the following by the end of the investigation:

- show how Aboriginal people of the past and early settlers viewed and valued the Australian environment
- describe natural cycles like seasons and the water cycle
- show how Aboriginal groups and settler groups used the environment to survive
- show how some ways of using environments have caused problems that now need solving
- find examples of environments being restored to a healthy state
- describe a future that they would prefer for an environment.

Students fold a piece of paper in half to form a four-page booklet. On the first page they write 'How the natural environment has been treated in Australia'. On the second page they write the word 'THINK'. On the third page they write 'WINK', and on the last page they write 'Decide'. (This is also known as KWL.) Students write the following on the appropriate pages:

- What I already know — THINK (Things I Now Know)
- Questions I have about the topic — WINK (What I Need to Know)
- A question from the WINK list to share with the class — Decide.

Assist students to complete their first entry — for example, brainstorm knowledge about Aboriginal people and the land, settlers and environmental issues today. Students keep their booklet in a folder and review their entries as they progress through the activities.

Phase 3 Looking for information

Core learning outcomes emphasis: TCC 3.4, TCC 3.5, PS 3.1, SRP 3.1

Students investigate information about Aboriginal and European attitudes toward, and treatment of, Australia’s natural environment prior to and during colonial times, using various texts from a range of primary and secondary sources.

Activity 3 Looking at perspectives about the land

Resource 3

Teaching considerations

Copy and cut out one complete set of extracts from Resource 3 for each group prior to the activity. Note that Aboriginal and Torres Strait Islander sources are contemporary due to the lack of any earlier written sources. Some terms within sources may require explanation.

Organise students into small groups. Groups read the extracts from Resource 3 and use the questions in the following table to analyse the information sources.

Source	Whose point of view is this?	What does this person think of this place?	How does this person use this place?
1			
2			
3			
4			

Discuss how people have different experiences and points of view about the same things, which may be referred to as ‘perspectives’. Other activities will explore perspectives further.

Activity 4 Understanding natural cycles

Support materials and references

Teaching considerations

This activity can be augmented with resources from the library. There are many picture books that tell stories of Aboriginal people’s understanding of how to use natural resources sustainably. Some are listed in ‘Support materials and references’.

Resource 4

Students read Resource 4. After clarifying the meaning of any unknown words, students move into pairs. Each pair composes a two-sentence description of how Aboriginal people understand and use the natural environment. Each pair then joins another pair. They read each other’s description and combine their ideas to produce a group response. Each group of four then presents its final description to the class. This can be done orally, visually (with time to prepare a poster) or through a combination of both.

Have students return to their ‘THINK, WINK, Decide’ booklet to see if any of their questions have been answered. They add to the section ‘What I already know’ and pose new questions about the topic.

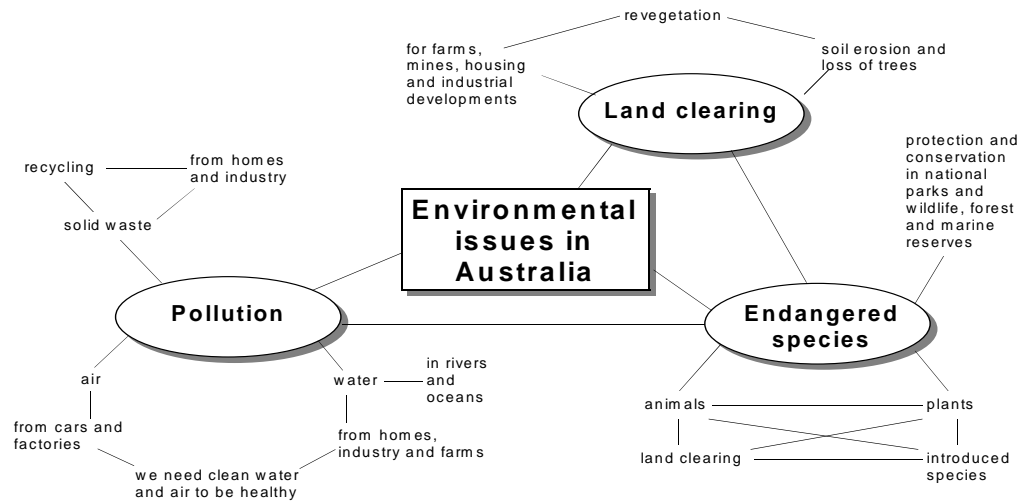
Activity 5 Looking at colonial resource use

Resource 5

Teaching considerations

Although this activity is designed for a group of 24, it can easily be adapted for more or fewer students. Copy and cut out sources on Resource 5. Source materials are provided to suit the different reading needs of students. You may prefer to start with eight groups of three or four, or six groups of four depending on numbers and abilities. If students are not familiar with concept mapping, explain the strategy using the example on the next page. This example is a simple visual representation of some environmental issues in Australia. The concept map lists concepts or ideas and shows, to some extent, how they are linked or related. A valuable follow-up activity, which compares English and Australian environmental conditions, is located in *Year 5 Social Studies Replacement Units 1 and 2* (Queensland Department of Education 1995, pp. 93–94).

Sample concept map



Resource 5

Divide students into eight groups of three. Number these groups from one to eight. Give each group copies of one of the eight sources on Resource 5 — for example, group one receives source one, group two receives source two, and so on. Each group reads their source and makes sure they understand it, asking for clarification where necessary. Students underline what they think is the most important information in their source.

Students move into three groups of eight. Each group of eight will have a person from each group of three.

Students briefly describe to their group what their source is about, using their underlined information as a focus. Each group discusses their understanding of how colonists used natural resources and presents it in a visual form, such as a concept map, to the other two groups.

Activity 6 Looking at the impact of introduced species on environments

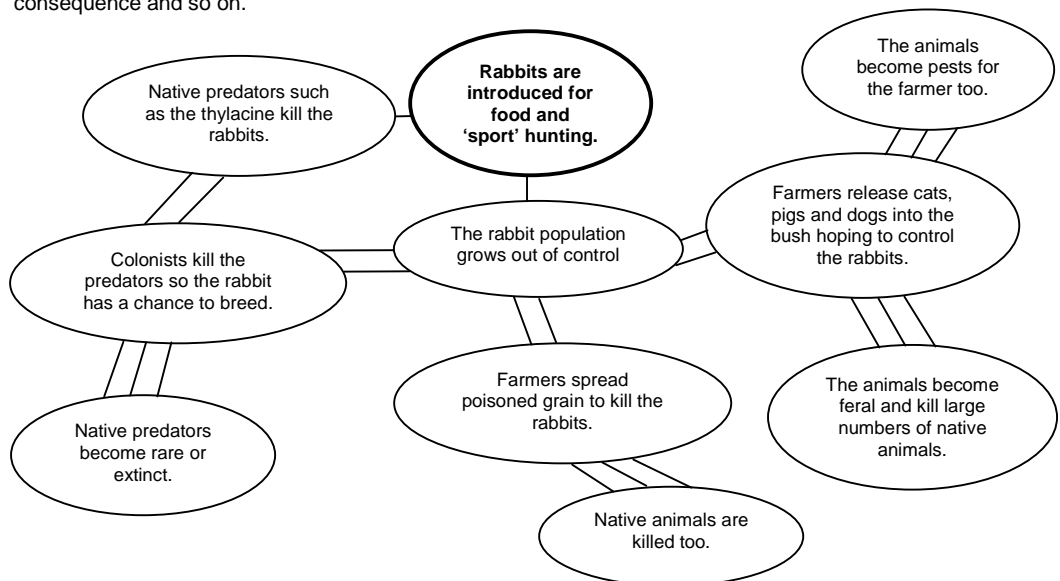
Resource 7

Teaching considerations

Following is an example of what a consequence chart about the impact of introduced species might look like. Refer to Resource 7 for instructions on how to develop a consequence chart. When constructing this chart, use students' ideas to make it grow. Draw this chart on a large sheet of paper so that it can remain on display.

Sample consequence chart

The number of lines between each oval indicates the order of the consequence — that is, one line indicates a first-order consequence, two lines indicate a second-order consequence, three lines a third-order consequence and so on.



Resource 6 Students list the animals they think were brought to Australia with the First Fleet and share their list with a partner. Show students the 'Introduced animals' list on Resource 6 (OHT) and discuss.

Select students to read aloud the sections on Resource 6 about the introduction of rabbits, sheep and cattle to Australia. As a class, use this information to develop a consequence chart. Continue until students can think of no more consequences.

Have students revisit their 'THINK, WINK, Decide' booklet.

Phase 4 Sorting information

Core learning outcomes emphasis: TCC 3.4, CI 3.4

Students sort information to clarify their understanding of the consequences of how Europeans used the natural environment in colonial times.

Activity 7 Charting consequences for environments

Resource 7 Working in pairs, students review the source material from Phase 3 activities. Pairs choose a number of sources and complete their own consequence chart (Resource 7) about the impact of European colonists on the natural environment. Pairs list the sources they used and briefly explain their consequence chart to the rest of the class.

To extend students' critical understanding of the analysis they have made, ask them to account for the differences in the outcomes of pairs — for example, If the topic is the same, why is Kim and Jan's chart so different from Li and Byran's? Students may suggest it is because the pairs used different sources. This could lead to a brief discussion about the problematic nature of information — for example, Whose perspective is represented? How complete is the information we have?

Have students revisit their 'THINK, WINK, Decide' booklet.

Activity 8 Charting consequences for Aboriginal people

Teaching considerations

The following activity develops an understanding of Aboriginal people's relationship with the land. The artistic expression that concludes the activity can be used to assess students' demonstrations of CI 3.4.

Have students select an environmental change from the Activity 5 or 6 concept maps and consequence chart as a focus for a new collaborative consequence chart.

Pose the question: How did this environmental change affect Aboriginal people at the time? Have students contribute to the consequence chart. Refer students to previous resources for ideas. Encourage inferences also. For example, land clearing caused loss of food sources for Aboriginal people, so students could infer that this caused Aboriginal people to be hungry, become sick, die, use European livestock for food, leave their land, or fight with European settlers.

Set a scenario for the students — for example, You are a child of an Aboriginal group that is experiencing great hardship because settlers have been clearing the land. Consider what changes you would experience and how you would feel. Use an artistic medium such as dance, drama, poetry, painting or drawing to show these changes and how you feel.

Phase 5 Testing ideas

Core learning outcomes emphasis: TCC 3.4, PS 3.1, SRP 3.1

Students research if and how past environmental problems are evident today. They consider the importance of understanding natural cycles when planning to care for the environment, using the water cycle as an example. Students also reach some conclusions about the state of the Australian environment today.

Activity 9 Researching the state of the environment in Australia today

Teaching considerations

Focus on completing a retrieval chart rather than a 'project' on a chart with pictures. Students can use sources from this module to answer the first question in the activity. Answers to the second and third questions can be more easily found in books and newspapers or on websites.

Have students investigate how early environmental problems have grown into bigger issues today — for example, land clearing, introduced species, water use, endangered species and pollution. Small groups of students research one of these or other issues, such as those discussed previously.

Assist the class to prepare a list of questions before beginning the research. Having all groups use the same set of questions makes the research easier to compare.

Questions may include:

- When did this problem begin? (Provide an example of a related colonial activity such as tree clearing for farming.)
- What is the present situation? (Provide evidence of where or how the problem exists/persists in Australia today.)
- What needs to be or is being done about it? (Provide an example of what needs to change or which groups need to change their actions, or give evidence describing how some people are working towards solving the problem.)

Students record their findings on a retrieval chart such as the following and report their findings to the class.

Environmental issue:			
When did the problem begin?	What is the problem like now?	What needs to be done?	What is being done?

Activity 10 Understanding the environment helps

Teaching considerations

The premise behind this activity is that if people understand natural systems (in this case, the water cycle) they can better understand the impact they have on them. At this level, students do not require a complete understanding of the water cycle. Students may benefit from viewing a simple, brief video about the water cycle. There is a short animated movie of the water cycle at the Brainpop website (www.brainpop.com/science/ecology/watercycle/index.weml). Refer to Science Levels 3 and 4 for more information about the water cycle. Another useful resource is *Whizzy and Zak's Fabulous Adventures* (Queensland Department of Natural Resources 1997).

Support materials and references

Resources 8 and 9

Working in pairs, students make their own simple water cycle by following the instructions in Part 1 of Resource 9. Pairs observe what occurs at intervals and write their observations in the table. Students share their observations. Discuss these observations in relation to the water cycle (refer to Resource 8).

Support materials and references

In pairs, students write a short story about the journey of a drop of water through the water cycle. (An example of this can be found at www.zip.com.au/~elanora/cycle.html)

Students consider how pollution or changes to the environment might affect the drop of water and its journey. Each pair shares their story with another pair. A story that closely reflects the water cycle may be read to the class. Have students refer to the water cycle diagram to consider the ways in which people interact with the water cycle and list them in part 2 of Resource 9. Students share their responses with the class.

Phase 6 Taking action

Core learning outcomes emphasis: TCC 3.3

Support materials and references

Students consider their probable and preferred environmental future and plan to do something to enable their preferred future. See Hicks (1994) in 'Support materials and references' for futures studies ideas.

Activity 11 Designing a sustainable future

Ask students to think about how people's actions today might affect the environment in the future. Use the following table for students to complete individually, in pairs or as a whole-class activity. Encourage students to suggest other actions that would lead to an undesirable future and add these to the table. Students could choose one of the features of an undesirable future and draw what it might look like.

If we do these things now...	What might the future be like?
Cut down many trees	
Make lots of rubbish	
Put waste into rivers and oceans	
Fail to protect native plants and animals	
Ride bikes and use public transport instead of cars	

Working in pairs, students describe what their preferred environmental future would be by listing its features — for example, clean water, areas of bush and parkland, diverse fauna. Collate students' responses to compile a description or a class list of the features of a preferred environmental future. Students consider and list what would have to be done now to make this preferred future a reality — for example, reduce the amount of rubbish that is deposited into rivers and oceans, conserve areas of land/forest, remove introduced predators. Students could draw their preferred environmental future individually, in small groups or as a class mural and display it alongside their drawings of an undesirable future.

Activity 12 Developing a personal or class action plan

Support materials and references

As a class, students brainstorm a list of things they can do to help manage environmental problems. Students choose something from the list that they can act upon either individually (for example, turning off taps to conserve water) or as a group or class (for example, starting a recycling program at school, undertaking or helping with a revegetation project). See 'Support materials and references' for a list of projects and organisations that may be helpful when students are searching for a way to get involved. Students may record or report on their participation.

Have students revisit their 'THINK, WINK, Decide' booklet.

Phase 7 Reflecting on what has been learnt

Core learning outcomes emphasis: TCC 3.3, TCC 3.4, TCC 3.5, PS 3.1, CI 3.4, SRP 3.1

Students reflect on their learning by creating a map of their progress throughout the investigation and providing comments on each stage.

Activity 13 Creating learning maps

As a class, students discuss the investigation of the use of environments past and present by recalling the activities they have undertaken. Refer students to their 'THINK, WINK, Decide' booklets and the learning outcomes outlined in Activity 2.

Have students draw their investigation as a story map. The map should be sequential and include pictures of the activities completed. Students can use speech and thought balloons and captions to describe the pictures. These may include comments about what they learnt and their feelings about, and evaluations of, the activity or their involvement in it. Display individual maps for the class to share. Differences and similarities of perceptions may be noted or discussed.

Assessment

Student–teacher conferencing using the 'THINK, WINK, Decide' booklet and the story map may provide further evidence of students' demonstrations of the learning outcomes of this module.

Unmatched statements: Part 1

Resource 1

.....

a. Sydney Cove had lots of tall hardwood trees. Some of the trees were so hard that axes and saws were blunted and broke. To clear the area the First Fleeters used . . .

.....

b. My father was a neighbour of the cattleman Sidney Kidman and knew him all his life. He always used to say that Kidman had done more damage to Australia than the . . .

.....

c. A group of four people went koala shooting last week and in six hours killed . . .

.....

d. In the whole world there is not a . . .

.....

e. Since the First Fleet landed in Sydney Cove, 1 900 . . .

.....

f. People who live in Brisbane make enough household waste to fill . . .

.....

g. We have more marsupials than any other country. In the last 200 years, ten . . .

.....

Unmatched statements: Part 2

.....

1. types of plants have been introduced to Australia. More than half of them are now weeds.

.....

2. have become extinct. The remaining 134 must be protected.

.....

3. gunpowder and blew the trees out of the ground!

.....

4. the Gabba Cricket Ground to the top of the stands three times a year.

.....

5. rabbit.

.....

6. worse country.

.....

7. 107.

.....

Matched statements**Resource 2****First Fleeters clearing land in Sydney (a3)**

Sydney Cove was well wooded with tall hardwood trees — so hard in fact, that axes and saws soon blunted and broke. To clear the area they resorted to gunpowder and blew trees out of the ground!

Source: Nicholson, J. 1995, *The First Fleet: A New Beginning in an Old Land*, Allen & Unwin, Sydney, p. 22.

Well-known cattleman and property owner Sidney Kidman (b5)

My father, a neighbour of Kidman's near Kapunda, who had known Kidman all his life ... always used to say that Kidman had done more damage to Australia than the rabbit.

Source: Dutton, G. 1985, *The Squatters*, Currey O'Neil, Melbourne, p. 117.

Hunting koalas near Canberra (c7)

A party of four persons went [koala] bear shooting last week and in six hours managed to secure [kill] 107, which were soon deprived of their skins.

Source: *Queanbeyan Age*, July 1883.

The first governor's view of Australian land (d6)

... in the whole world there is not a worse country.

Source: These comments are attributed, according to hearsay, to Arthur Phillip, Governor of New South Wales, 1789.

Introduced species (e1)

Pests — since European settlement, 1 900 species of plants have been introduced, of which more than half are now weeds.

Source: Environment Australia 1996, *State of the Environment Australia: Key Findings from the First Independent National Report*, Canberra, p. 6.22.

Household waste (f4)

Brisbane residents produce enough household waste to fill the Woolloongabba Cricket Ground to the top of the stands two to three times a year.

Source: Queensland Department of Environment and Heritage 1991, *Reduce, Re-use, Recycle: A Sourcebook: Years 4–7*, Brisbane, p. 6.

Endangered species (g2)

We have more marsupials than any other country. In the past two centuries ten have become extinct. The remaining 134 must be protected.

Source: Prideaux, M. & Washington, H. 1998, 'On the brink: Australia's threatened species', *Habitat Australia*, vol. 26, no. 6, December, p. 25.

Attitudes toward the Australian environment**Resource 3****Source 1**

I don't have a very good opinion of the country. Most of it is poor, barren and rocky. It is very hard to clear the trees and roots. It is also hard to grow crops in this soil. The corn we have planted doesn't look very good. Most people seem to be sick and tired of this place and wish they were safe back in England.

Source: Rev. Richard Johnson in a letter to a friend in England, November 1788. Adapted from a letter reprinted in Berzins, B. 1988, *The Coming of the Strangers: Life in Australia 1788–1822*, State Library of New South Wales & Collins Publishers, Sydney, p. 44.

Source 2

The wind felt like the blast from a heated oven. Our dogs and fowls lay panting in the shade, or were rushing into the water. The gardens have suffered. All the plants which had not taken deep root were killed by the power of the sun. People had pains in their stomachs and headaches.

Source: Captain Watkin Tench writing in his journal in December 1790. Adapted from Tench, W. 1793, *A Complete Account of the Settlement at Port Jackson*, reprinted Tench, W. 1997, 1788, The Text Publishing Company, Melbourne, pp. 232–233.

Source 3

The ground is so arid that men die working it. There are blacks and snakes and it is awful hot. This is a dangerous country to live in. I worked thirty miles in the summer sun and got burnt so bad that I thought I should have died very soon.

Source: Margaret Catchpole in a letter to her aunt and uncle in 1804. Adapted from text reprinted in Berzins, B. 1988, *The Coming of the Strangers: Life in Australia 1788–1822*, State Library of New South Wales & Collins Publishers, Sydney, p. 44.

Source 4

In the whole world there is not a worse country.

Source: These comments are attributed, according to hearsay, to Arthur Phillip, Governor of New South Wales, 1789.

Source 5

Land and its meaning is essential to us. From the time of a child's first footsteps we are taught about the land. We learn the names and meanings of thousands of features upon the landscape. The land for us is like a huge, detailed road map in our minds. Instead of petrol stations and towns on the map, we have water holes, animal tracks and food gathering locations.

Source: Lester, Y. 1996, *Our Land Our Life*, card, Aboriginal and Torres Strait Islander Commission, Canberra. (Yami Lester is a Yankunytjatjara Elder from the Northern Territory.)

Source 6

Father spoke for the first time since we had killed the kookaburra. He asked for no excuses for what we had done, and we did not offer any. We must all take the blame. That is the way of the Aborigine. Since we had killed for the sake of killing, the punishment was that for three months we should not hunt or use our weapons. For three months we would eat only the white man's hated rations.

Source: Oodgeroo 1993, *Stradbroke Dreamtime*, Angus & Robertson, Sydney, p. 11.

Source 7

The hunting and gathering done by Aboriginal people didn't harm waterways and wetlands. Canals and dams they built were used to increase fish numbers and flush out streams. There are Dreaming stories that tell how important it is to take care of waterholes and springs. Water was clean and kept that way. Hunting around waterholes was not allowed during a drought. This kept the water clean and allowed all living things to use it.

Source: Adapted from Clean Up Australia & NSW Board of Studies 1995, *Towards a New Dreaming: Future Directions for Land Management in Australia*, Sydney, p. 13.

Source 8

We don't own the land, the land owns us. The land is my mother, my mother is the land. Land is the starting point to where it all began. It's like picking up a piece of dirt and saying this is where I started and this is where I'll go. The land is our food, our culture, our spirit and identity.

Source: Knight, S. 1996, *Our Land Our Life*, card, Aboriginal and Torres Strait Islander Commission, Canberra.

Signs in nature

Aboriginal people understood their natural environment so well they could use signs in nature to work out when to hunt or collect certain foods. Here are three examples from different groups in different parts of Queensland – the Badtjala people of Fraser Island and nearby mainland; the Wulgurukaba people of the Townsville region; and the Nunukul, Nughie and Goenpil people of North Stradbroke Island and Moreton Island.

Natural signs, trees flowering, bark falling, and so on, were used as signals just like we use calendars today. Different trees told different stories. Some told when the mud crabs or oysters were fat, others told when the mullet were ready for eating. The bush was full of signals you could read. It's like a story book. Have a look at the bush and it tells you what's happening. Some people look and see and some people look and see nothing.

Source: Queensland Department of Education 1996, *This Place Our Story*, Wide Bay Central School Support Centre, Maryborough, Qld, p. 5.

The flowering of the Leichardt indicates that the barramundi are ready to catch in the rivers as they move upstream.

The people knew not to eat kangaroo in the dry, as they are full of worms which will be killed by the new grass (in the wet season).

Source: Museum of Tropical Queensland 1995, *Yamini Storyline*, Townsville, Qld, p. 16.

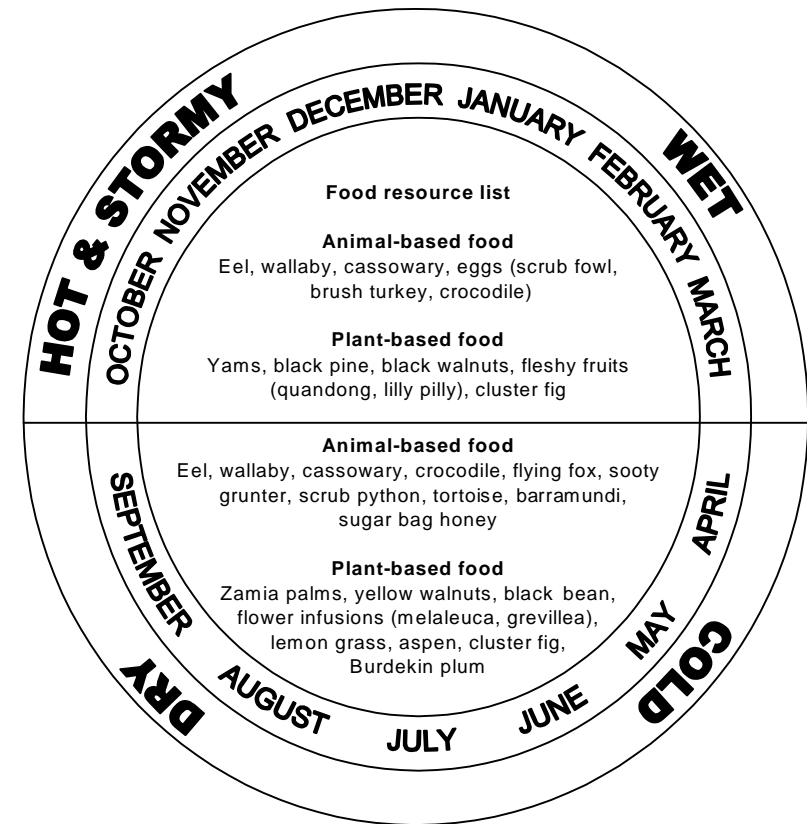
- When lorikeets are plentiful it is a good season for sea mullet.
- When hairy grubs travel linked together in a long row it means the mullet season is starting and the fish are moving up the east coast to their spawning grounds.
- When the wattle is in flower it signals the beginning of the tailor season.
- When the blackbutt is in flower it means that parrot fish are in the bay.
- When the hop bush flowers, oysters are at their best.

Source: Redlands Tourism, Moreton Bay Environmental Education Centre, Minjerribah & Moorgumpin Elders & Victoria Point State School 1998, *Minjerribah: An Indigenous Story of North Stradbroke Island*, Education Queensland, Brisbane, p. 11.

Resource 4

Seasonal food resource calendar

The Wet Tropics area of far north Queensland stretched from around Townsville to Cooktown. Aboriginal people here understood the rainforest and its seasons. They had a healthy diet, fishing, hunting and gathering foods when the foods were at their best.



Source: Daradgee Environmental Education Centre in association with the Jumbun Community, Cairns 1992, *Wet Tropics World Heritage Area: A Traditional Aboriginal Food Resource*, poster, Queensland Department of Education, Brisbane.

Colonists' use of resources

Resource 5

① The resources of the Sydney area were heavily used from January 1788 as the fleet could only bring limited supplies. There was not much fresh water and it was heavily used and quickly became polluted.

Huge nets were used to haul in shoals of fish. Introduced vegetables and wheat were not growing well and there was a meat shortage. Kangaroos and other animals were hunted by convicts. Convicts also collected sarsaparilla plants to make tea and wild greens for vegetables.

Source: Adapted from Grimshaw, P., Lake, M., McGrath, A. & Quartly, M. 1994, *Creating a Nation*, Penguin, Melbourne, p. 23.

② Twelve years after the first ship arrived in Botany Bay, the environment had been changed a lot by the British.

- The colony had 5 200 non-Aboriginal people living in it.
- Some cattle and other animals had gone wild.
- There were 830 cattle, 3 090 goats, 2 390 hogs and 5 700 sheep in captivity.
- Much land was taken up with agriculture including 4 665 acres of wheat and 2 930 acres of corn.
- At Parramatta there were a large brick barracks, other buildings, a windmill tower, mills and a gaol.
- Trees were constantly being cut down for building, ship repairs, farm machinery, wheels, gun carriages and fuel.

Source: Adapted from Grimshaw, P., Lake, M., McGrath, A. & Quartly, M. 1994, *Creating a Nation*, Penguin, Melbourne, p. 24.

③ Clearing took place quickly even though the colonists didn't have very good tools. The first camp covered 885 square metres. By 1795, 2 193 hectares of bush had been opened up and by 1820, 12 141 hectares were cleared. Clearing, farming and grazing, and the search for useful timber, plants and animals had a large effect on the landscape. Some plants became rare around Sydney, including the native sarsaparilla which made a sweet tea, and the cabbage tree palm which was used for roofing, hats and pig fodder.

Australia's first conservation order was made in March 1788. It said that no one was allowed to cut down trees within fifteen metres of the Tank Stream, which the settlement used for water. As early as 1795, red cedar was being logged along the Hawkesbury River and shipped overseas. As the timber around Sydney ran out, they looked for more further away. In 1801 convicts were cutting cedar from along the Hunter River. In 1803 there was already erosion along the banks of the Hawkesbury, Nepean and Georges Rivers. Governor King ordered that no-one was allowed to cut down any tree or plant within two rods of the river bank. The cutting of cedar continued in the Illawarra, Shoalhaven and Port Stephens areas. Many government orders were made to control the amount of timber being taken but many people just ignored the orders.

Source: Adapted from Berzins, B. 1988, *The Coming of the Strangers: Life in Australia 1788–1822*, State Library of New South Wales & Collins Publishers, Sydney, pp. 56–57.

④ Sealing became an important industry for the new colony. Enormous numbers of seals were killed. Captain Bishop brought back 9 000 skins from Cape Barren Island in 1798. In one week in Sydney in 1809, 45 000 skins arrived in Sydney. The French navigator Baudin wrote a letter to Governor King in 1802 after visiting King Island. In it he warned that if something wasn't done to stop the slaughter, there wouldn't be any seals left. King did try but within a few years of the beginning of sealing, almost all Bass Strait seals were killed. The sealers just moved on to other areas and continued their work.

Source: Adapted from Berzins, B. 1988, *The Coming of the Strangers: Life in Australia 1788–1822*, State Library of New South Wales & Collins Publishers, Sydney, p. 58.

(continued)

Colonists' use of resources (continued)

Resource 5

⑤ Wallabies, wallaroos, kangaroos, possums and koalas were shot for sport. An article in the newspaper the *Queanbeyan Age* in July 1883 said that four people went 'bear' shooting and killed 107 koalas in six hours. Another article in the same newspaper talked about a group of men who went after the koalas for their skins. The shooters 'blazed away at them with shotguns just for the fun of it'.

In August 1883, Charles Bates took three tons of possum skins to Goulburn in his wagon. One farmer invited shooters to his property and gave them ammunition and supper. Over 800 possums were shot that day.

Wallabies caused damage to crops so they were shot. The Pastures Protection Board paid shooters for each scalp. William Davis went on hunting parties once a year for a number of years with some friends. In 1874, '75 and '76 they killed over 3 000 wallabies each year. Wedge-tailed eagles were also favourite targets for sports shooters. Graziers also killed many of these birds because they attacked lambs.

Source: Adapted from Gillespie, L. 1998, 'A different attitude to wildlife', *The Canberra Times*, 9 July, p. 7.

----- ✂ -----
 The time is coming when the destruction of timber in many parts of the colony will be badly felt. Much land clearing has been wasteful. Only when people realise how much of our forests are gone will they want to protect them. Then they will wonder why they didn't realise that chopping down trees without replanting them would cause a shortage.

Source: McDowall, A. Gympie District Surveyor 1889. Adapted from a report reprinted in Hibbard, A. & Crosby, E. 1991, *The Mill Point Conservation Plan: Cooloola National Park*, Queensland Department of Environment and Heritage, Brisbane, p. 41.

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 ⑦ A favourite pastime of the squatter was to organise kangaroo and emu drives with the dogs turned loose. Pemberton Hodgson, remembering his short stay on the Darling Downs, said, 'It is a sad fact that in places where I have seen herds of 300 kangaroo, there is not one to be seen now. They will never eat a blade of grass that has been cropped by sheep'.

In 1846, the Rev. John Gregor of Moreton Bay observed that the 'white man' had driven the native fauna into the remote corners of the ranges. In 1859, assistant surveyor Edward Pechey, travelling on the Downs west of Dalby, noted in his diary the rare sighting of a kangaroo and emu.

William Ridley reported that, on the western Downs and Maranoa, the smell of cattle kept the kangaroos away from the best waterholes. He also said that the drovers kept the Aborigines away from the best waterholes. He said the Aborigines had to rely on small supplies of bad water and few animals around polluted waterholes.

Source: Adapted from French, M. 1989, *Conflict on the Condamine*, Darling Downs Institute Press, Toowoomba, Qld p. 97.

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 ⑧ To the teachers and pupils of the Kin Kin State School

The rain forest of Kin Kin, which has now almost entirely disappeared, was one of the most luxuriant in Australia. There are many photographs of the trees of the Kin Kin rainforest in this work. They may convey to you some slight idea of its grandeur and diversity. Presented with the writer's compliments.

W.D. Francis
 Botanic Museum and Herbarium
 Botanic Gardens
 Brisbane
 20th June, 1951

Source: From a 1951 handwritten note by Queensland Government Botanist in the front of his book: Francis, W. D. 1929, *Australian Rainforest Trees*, Queensland Museum, Brisbane.

Introduced animals

Resource 6

The animals that came to Australia with the First Fleet included:

- 18 turkeys
- 87 chickens
- 44 sheep
- 5 rabbits
- 29 geese
- 6 horses
- 19 goats
- cats and dogs
- 35 ducks
- 6 cattle
- 32 pigs

There were also rats and mice among the First Fleet's cargo.

Many of these introduced animals became pests and all of them changed the natural environment of Australia.

Introduction of rabbits

Colonists introduced rabbits for food and sport hunting. They killed native predators so that the rabbit would have a chance to breed. They distributed rabbits around Australia. This hastened the spread of rabbits.

By 1870 the rabbit population was so large that the rabbit had become a pest.

Farmers shot rabbits and received a bounty for their skins. Farmers also spread poisoned grain on the ground to kill the rabbits but this killed native animals as well.

Introduction of sheep and cattle

The colonists introduced sheep and cattle for food in the new country. They killed kangaroos so that there would be more grass for the sheep and cattle. Then they killed native predators which, without kangaroos to eat, attacked the livestock.

Sheep and cattle damaged the land in a number of ways. They made waterholes muddy and used the limited water supply. They also polluted waterholes with their waste. The damage to the waterholes affected the native animals that lived in and around them.

The hard hooves of sheep and cattle damaged plants and crushed or compacted the soil. This stopped grass from growing and caused erosion. They also ate plants down to the roots. This meant the plants were killed and could not grow back. Sheep were especially bad at doing this. As numbers grew, the colonists cut down more trees to make room for their sheep and cattle. Native animals lost their homes and food sources.

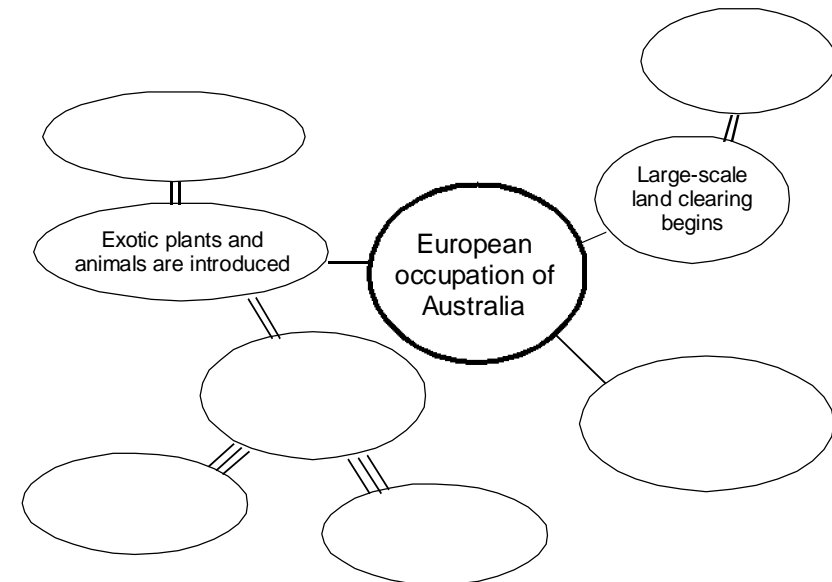
Consequence chart

Resource 7

Directions

1. In the centre circle, write an event such as 'European occupation of Australia' or 'The introduction of exotic species' or 'Large-scale land clearing'.
2. Think of a direct environmental consequence of this event, write it in an oval and connect the oval to the centre with a single line. This is a first-order consequence. Think of some others and write them in.
3. Think of a second-order consequence that resulted from the first-order consequence. Write it in an oval and join it to the first-order consequence with a double line.
4. Keep going until you cannot think of any more consequences.

Note: Most events have positive and negative consequences. What is positive for some people in the short term may be negative for others or the environment.

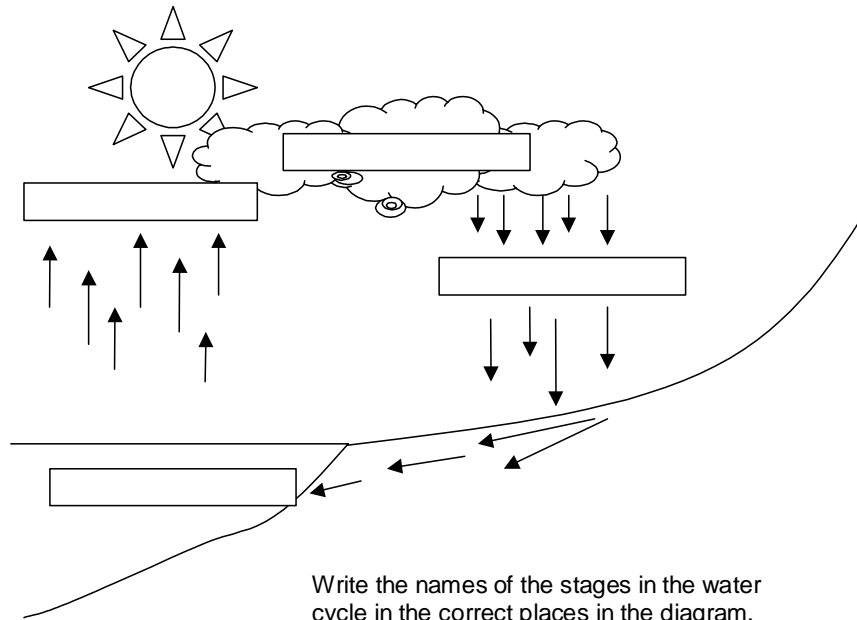


Water cycle

Resource 8

About 70 per cent of the Earth is covered with water. That water has been around for millions of years. The same water is recycled over and over again. This is called the water cycle. There are four stages in the water cycle.

- 1. Evaporation:** When lakes, oceans, rivers and streams are heated by the sun, the liquid water evaporates into a gas called *water vapour*.
- 2. Condensation:** When water vapour cools it turns back into tiny drops of water. These droplets remain in the atmosphere and form clouds.
- 3. Precipitation:** As the water droplets become larger and join together they become too heavy to remain in the atmosphere. Water from the clouds falls to Earth as rain, hail or snow.
- 4. Collection:** Rain, hail and snow go back into lakes, oceans, rivers and streams.



Water cycle activity

Resource 9

Part 1: Making a water cycle

1. Put two spoonfuls of water into a small plastic bag.
2. Blow air into the bag and seal it with a heavy rubber band.
3. Place the bag in a sunny window.
4. Record your observations in the table below.

Time	Observations (What did you see?)

Part 2: The people factor

Human activity related to the water cycle	Effect on the quality of water within the water cycle		
	Positive	Negative	Not sure
Using lots of strong detergents			
Using lots of water for irrigating farms and gardens in the middle of the day			
Tipping old paint down drains			
Leaving water running and not fixing dripping taps			
Connecting a water tank to the house			

Support materials and references

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Animal Liberation New South Wales, *Index of Lists/Feral*. www.animal-lib.org.au/lists/feral/
Material on feral animals.

Australian Conservation Foundation. www.acfonline.org.au/
Excellent 'Earthkids' pages.

Clean Up Australia. www.cleanup.com.au/

Department of the Environment and Heritage, *Environment Australia*. www.ea.gov.au/

Department of the Environment and Heritage, *Environment Australia Online – Biodiversity Group*. www.ea.gov.au/biodiversity

Economically Viable Alternative Green. www.altgreen.com.au/
Some good information on introduced species.

Elanora Heights Primary School, *The Water Cycle*. www.zip.com.au/~elanora/cycle.html

Environment Australia Online. www.ea.gov.au/biodiversity/threatened/
Some good material on threatened species, including 'Green kids' guide to threatened species: Nine ways you can help.

Greenpeace Australia Pacific. www.greenpeace.org.au/

Keep Australia Beautiful. www.keeppaustraliabeautiful.com.au/

Queensland Environmental Protection Agency. www.epa.qld.gov.au/

Worldwide Fund for Nature (WWF), *Kids and Teachers*. www.panda.org/kids/kids.htm
Good pages for children.

Aboriginal studies

Aboriginal Australia. www.aboriginalaustralia.com.au.

Go to 'shop' then 'Educational resource package' which contains a wall map of Aboriginal language, tribal and nation groups.

Australian Institute of Aboriginal and Torres Strait Islander Studies.

www.aiatsis.gov.au/news/links.htm

This group published *Encyclopedia of Aboriginal Australia* (Horton 1994). Has lots of information and web links.

Brainpop. www.brainpop.com/science/ecology/watercycle/index.weml

Has a short animated movie of the water cycle.

Brisbane City Council/Community Website, *Brisbane Stories*.

www.brisbane-stories.powerup.com.au/.

Some excellent Aboriginal and colonists' stories of early Brisbane.

Council for Aboriginal Reconciliation. www.austlii.edu.au/car/

A lot of information and material including a library and links to other sites.

Dharawal Education Centre. www.koori.usyd.edu.au/dharawal

Provides a localised Sydney traditional perspective in a number of areas including culture and education. The Dharawal people's traditional lands border the south-eastern shore of Sydney Harbour. The Dharawal people encountered Captain Cook in 1770 and Captain Phillip in 1788.

Acknowledgments

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