Environmental education for sustainability

Catalogue of digital curriculum resources
# Contents

## Introduction  
4

## Learning objects  
5

### Studies of Australia  
5  
- National parks series (Years P–2)  
- Make it alive series (Years P–4)  
- Island life series (Years P–6)  
- The night of the bilby series (ESL) (Years 3–4)  
- Water matters series (Years 3–6)  
- Community enterprise series (Years 3–8)  
- Community enterprise: pools, parks and toys (ESL) (Years 3–4)  
- Kangaroo series (Years 5–8)  
- Cartown series (Years 5–8)  
- Points of origin series (Years 7–8)  
- Wind farm series (Years 7–10)  
- The futurist series (Years 7–10)  
- GM foods series (Years 7–10)  
- Fish stocks series (Years 7–10)  
- Resort rescue series (Years 9–10)  
- Green machine series (Years 9–10)  

## English and literacy  
26  
- Write an article: assessment series* (Years 5–6)  
- World heritage: Kakadu information display series (Years 5–7)  
- Koala control (Years 5–9)  
- Sea chase (Years 5–9)  
- Rainforest series (Years 5–9)  
- Online news series (Years 5–8)  
- Responsible fishing in Western Australia: write an article (Years 8–9)  

## Art and Design  
33  
- Directional design series (Years 9–10)  

## Science  
35  
- Soil series (Years P–2)  
- Water series (Years P–2)  
- Land use series (Years P–2)  
- Water use series (Years P–2)  
- Surviving in a habitat series (Years 3–4)  
- Human impact series (Years 3–4)  
- Energy from the sun series (Years 3–5)  
- Frog pond habitat series (Years 3–9)  
- Energy chains series (Years 4–8)  
- The colour of water series (Years 7–10)  
- Wind power series (Years 9–10)  
- Content from other sources  
- The place that's right for me (Years P–4)  
- Rainforest life series (Years 5–8)  
- Feral peril (Years 5–8)  
- Ecosystem balance (Years 5–10)  
- Eco series (Years 6–10)  
- EagleCat: plants (Years 8–12)  
- Greenhouse (Years 11–12)  
- Germination (Years 11–12)  
- Food chain (Years 11–12)  

## Digital resources  
57  
- Rabbit fence cartoon, 1884  
- Eucalypt bark and bushfires, 2000  
- Harpooning from a Japanese whaling vessel, 1992–93  
- Murray River in crisis, 2008  
- Landline – Ethanol Special, 2006: ‘Clean, green and healthier’  
- Life and Death on the Great Barrier Reef, 2002 – item 1  
- Chris Arthur recalls the Franklin River campaign, 2008  
- Forest clear-felling, c1905  
- Synthesising natural compounds for cosmetics  
- An innovative solar energy panel  
- Early monitoring of ozone depletion and global warming, 2004  

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Introduction
This catalogue contains details about the digital curriculum resources to support the teaching and learning of Environmental education for sustainability available from The Learning Federation (TLF) to all schools in Australia and New Zealand in the P–12 years.

Learning and assessment objects
The interactive multimedia learning objects encourage students to develop the knowledge, skills, values and understanding of, and concern for the natural environment, and the knowledge to contribute to ecologically sustainable development.

The learning objects are often published in series and some learning objects within a series are aggregated into single learning objects. Aggregated learning objects are identified with the symbol.

An asterisk (*) on the series title indicates that not all the learning objects in that series have been released. The remaining learning objects will be released progressively.

Some learning objects contain non-TLF content. See the acknowledgements and conditions of use in the learning objects for details.

Digital resources
A range of relevant single digitised items licensed from leading Australian and New Zealand cultural and scientific institutions are included in this catalogue. They are identified by the following symbols:

- clips from documentaries, newsreels, television programs and feature films
- photographs, line drawings and documents.

With each item, TLF supplies an educational value statement comprising a description and contextual information which enriches the value of the asset for the teacher or student.

Accessing and viewing the content
Government and non-government education authorities in each Australian state and territory and in New Zealand have responsibility for facilitating access to the pool of digital content. Full details about how to access the content, including the necessary technical and software requirements for viewing it, can be found at:

www.ndlrn.edu.au
Learning objects

Studies of Australia

National parks series (Years P–2)

Students explore some unusual artefacts created by Myles Dunphy, an early Australian bush conservationist, in the Blue Mountains region of New South Wales. He created these artefacts to help his family enjoy the Australian bush in more comfort.

Features include:
- a mentor character to engage the interest of young children
- a map showing the location of Australia's national parks
- photographs of authentic historical objects and descriptions of their structure and use.

Students:
- explore a case study of an early conservationist family.

National parks: boots in the bush
L689 – Years P–2

Students examine some unusual boots and work out their purpose. As they examine the boots and find out about members of the Dunphy family, students discover the difference between national parks and other areas. Students are prompted to decide who the boots belong to and receive assistive feedback to complete the identification.

National parks: wheels in the bush
L932 – Years P–2

Students examine a pram customised by Myles Dunphy to take his young son on long bushwalks. The pram unfolds and more information about national parks is uncovered as the students explore the pram.

This series contains non-TLF content. See Acknowledgements in the learning objects.
Make it alive series (Years P–4)

This series helps students understand the habitat, threats and survival needs of endangered Australian animals and birds in a game-like environment.

Features include:
• images and brief texts about various endangered Australian species and their habitats
• simulations of predator behaviour and competitor species and the dangers faced by various endangered Australian species over a single day or night
• an animated game-based activity
• instant feedback at all investigation stages
• randomised activity elements that support repeated use.

Students:
• identify factors that threaten the survival of various endangered species in Australia
• identify features of ecosystems that various endangered Australian species depend on for their survival
• take appropriate environmental initiatives on the basis of research findings.

<table>
<thead>
<tr>
<th>The night of the bilby: find food</th>
</tr>
</thead>
<tbody>
<tr>
<td>L896 – Years P–2</td>
</tr>
<tr>
<td>Students help bilbies gather food, including seeds, bulbs and spiders, while avoiding feral predators such as cats and foxes and competing with rabbits.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The night of the bilby: get home alive</th>
</tr>
</thead>
<tbody>
<tr>
<td>L907 – Years 3–4</td>
</tr>
<tr>
<td>Students help bilbies gather food, including seeds, bulbs and spiders, while avoiding feral predators such as cats and foxes and competing with rabbits. This learning object is similar to the night of the bilby: find food, however students have less time to complete the activity.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The night of the bilby: safe habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td>L908 – Years 3–4</td>
</tr>
<tr>
<td>Students determine how many bilbies a desert habitat can support by trapping and weighing insects, who form a significant part (up to 70 per cent) of the bilby diet. Students identify tracks in the desert sand to determine the presence of predators, then take steps to remove the predators.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Make it alive: superb parrots</th>
</tr>
</thead>
<tbody>
<tr>
<td>L6357 – Years 3–4</td>
</tr>
<tr>
<td>Students help a superb parrot to escape from dangerous feral cats, find sufficient food then search for an empty tree hollow to safely nest in. Students discover how feral birds and insects such as Indian Mynahs, starlings and honeybees are affecting the parrots’ survival by occupying tree hollows.</td>
</tr>
</tbody>
</table>
Make it alive: brush-tailed rock wallabies
L6355 – Years 3–4

Students help the rock wallaby to find enough food, such as flowers, native grasses and their seeds, and to search for safe places to hide from dangerous wild dogs to survive. They discover that feral animals such as goats, which eat the same plants, are affecting their chances of survival.

Make it alive: spotted tree frogs
L6358 – Years 3–4

Students discover what developing frogs eat then help them find enough food so they develop from the tadpole stage through to adulthood. They help the tadpoles escape from predatory fish, such as the introduced rainbow trout, and search for safe places in the bottom of the stream habitat for shelter.

Make it alive: flatback turtles
L6356 – Years 3–4

Students examine how feral animals such as wild pigs are affecting the flatback turtle’s chances of survival. Once the turtles hatch from their nests, students help them to reach the safety of the ocean without being eaten by predators.

This series contains non-TLF content. See Acknowledgements in the learning objects.
Island life series (Years P–6)

Students distinguish between needs and wants when selecting six items that will ensure their survival on a tropical island.

Features include:
- challenges for students to choose items needed for survival on a tropical island
- careful distinctions between needs and wants
- animated feedback to demonstrate the consequences of decisions made
- a colourful setting and bright calypso music.

Students:
- distinguish between needs and wants when planning to live on a tropical island
- observe the social, environmental and personal consequences of selecting needs or wants.

Island life: needs and wants
L1008 – Years P–2

Island life prompts students to distinguish between needs and wants in an engaging, fun manner. To survive on a tropical island, students choose six items to take with them. When they arrive on the island the consequences of their choices become apparent. If they have chosen unwisely people get sick, the water becomes polluted, rubbish accumulates, trees disappear and buildings fall into disrepair. Students are prompted to revise their selections on subsequent visits to the mainland.

Island life: smart choices
L1034 – Years 3–4

Students continue to distinguish between needs and wants, but at more sophisticated levels. Choices are less black and white and require greater consideration. For example, students must decide whether a fishing rod is more important than a surfboard, or a packet of seeds is of greater worth than a packet of lollies.

Island life: life choices
L1035 – Years 5–6

Students continue to distinguish between needs and wants, but at more sophisticated levels. Choices are less black and white and require greater consideration. For example, students must decide whether a fishing rod is more important than a surfboard, or a packet of seeds is of greater worth than a packet of lollies.

This series contains non-TLF content. See Acknowledgements in the learning objects.
The night of the bilby series (ESL) (Years 3–4)

Students look at the threats to the survival of an endangered Australian species by using an animated game-based activity.

**Features include:**
- images and brief texts about the bilby and its habitat
- educational design that supports repeated use
- modified language for English as a Second Language users
- a hyperlinked glossary definitions for some terms used in the activity.

**Students:**
- identify factors that threaten the survival of bilbies
- identify features of an ecosystem that bilbies depend on for their survival.

The night of the bilby: get home alive [ESL]  
L9893 – Years 3–4

Students help bilbies to gather food such as seeds, bulbs and spiders. They must avoid being eaten by predators such as cats and foxes and find enough food before the night ends. Students notice that rabbits compete for the same resources as bilbies.

The night of the bilby: safe habitat [ESL]  
L9894 – Years 3–4

Students survey a desert environment to see if it is a suitable area to release bilbies. They estimate the amount of food available by trapping insects and small animals. Students then inspect the habitat for animal tracks made by predators or competitors, fence the area to keep out unwanted animals and remove any remaining threats.
Water matters series (Years 3–6)

Students select options to minimise water use while watering the garden, washing the car or having a water fight.

Features include:
- opportunities for minimising water used for watering gardens, washing cars and playing outside
- a look at the origin of water supplies and the limited nature of water resources
- opportunities to choose options before watering a garden, washing a car or having a water fight
- a graph and written report to determine the effectiveness of selections in saving water
- a printable report on the efficiency of water use selections.

Students:
- explain why it is important to conserve water
- identify effective ways of saving water while watering gardens.

### Water matters: watering the garden
L1798 – Years 3–4

This is a version of *Water matters: time to water the garden* for younger learners. Students follow the same process, although they do not have the option of selecting how long they will water the garden for.

### Water matters: time to water the garden
L1802 – Years 5–6

Students are reminded to conserve water. They select the equipment they will use, the time they will take and whether they will use mulch. They also select how frequently they will water the garden. After making their selections, students observe the consequences of their choices by comparing their water usage with an average figure, noting the health of the garden. Students are prompted to try again in order to become water savers.

### Water matters: car wash
L1800 – Years 3–4

Students follow the same process, although they do not have the option of selecting how long they will wash the car for. This is a version of *Water matters: washing the car* for younger learners.
| **Water matters: washing the car**  
L1803 – Years 5–6  
Students select equipment to wash a car, the time they will take, and whether they will complete the task on the driveway or lawn. They also select how frequently they will wash the car. After making their selections, students observe the consequences of their choices by comparing their water usage with an average figure, noting the health of the lawn. |
| **Water matters: water fight**  
L1801 – Years 3–4  
Students follow the same process, although they do not have the option of selecting how long they play for. |
| **Water matters: time for a water fight**  
L1804 – Years 5–6  
Students select equipment for a water fight, how long they will play for, and whether they will complete the task on the driveway or lawn. They also select how frequently they will have a water fight. After making their selections, students observe the consequences of their choices by comparing their water usage with an average figure, noting the health of the lawn. |
Community enterprise series (Years 3–8)

Trying to make decisions that benefit the economy, society and the environment can be a challenge. Students research, present and justify a recommendation that meets the requirements of the ‘triple bottom line’.

Features include:
- opportunities to investigate the social, economic and environmental consequences of proposed land uses
- tools to help compare, sort and analyse a range of opinions on the development of an unused site in a local community
- an interactive notebook for recording and analysing information
- a series pitched at three different levels, with increasing language complexity
- a printable report in the form of a letter recommending action and summarising reasons.

Students:
- investigate the environmental, social and economic consequences of redeveloping an unused factory site
- recommend a course of action that will maximise the environmental, social and economic benefits of redevelopment to a local community.

### Community enterprise: pools, parks and toys
L1026 – Years 3–4

Students enter their findings in a notebook, then conduct an analysis to determine which option will provide the best outcomes for the environment and the community, while remaining economically viable. The students then forward their recommendation to the mayor.

### Community enterprise: making a choice
L1025 – Years 5–6

Students enter their findings in a notebook, then conduct an analysis to determine which option will provide the best outcomes for the environment and the community, while remaining economically viable. The students then forward their recommendation to the mayor.

### Community enterprise: people, economy and the environment
L1002 – Years 7–8

Students compare the environmental, social and economic consequences of developing new enterprises in a small community. Students seek the opinions of a range of community members and gather information regarding the costs, environmental impacts and employment benefits of the different enterprises.
Community enterprise: pools, parks and toys (ESL)
(Years 3–4)

Students research, present and justify a recommendation that benefits the economy, society and the environment.

Features include:
- opportunities to investigate the social, economic and environmental consequences of proposed land uses
- tools to compare, sort and analyse a variety of opinions regarding the development of an unused site in a local community
- an interactive notebook to record and analyse information
- modified language for English as a Second Language users
- a cloze sequencing activity revising connectives such as 'also' and 'finally'
- a glossary of terms used in the activity
- a printable report showing the student's recommendations and reasoning.

Students:
- investigate the environmental, social and economic consequences of redeveloping an unused factory site
- recommend a course of action that will maximise the environmental, social and economic benefits of redevelopment to a local community.

Community enterprise: pools, parks and toys
[ESL]
L10436 – Years 3–4

Students help a local council investigate proposals for redeveloping an old factory site. They compare the benefits of building a swimming pool, toy factory or park. Students rate the economic, social and environmental effects of each proposal and write a letter to the mayor recommending a course of action.
Kangaroo series (Years 5–8)

Students consider the social, economic, environmental and animal welfare consequences of harvesting kangaroos, and manipulate popular media to promote their own viewpoint on whether kangaroos should be killed for human consumption.

Features include:
- a range of media sources for synthesising facts and opinions
- data comparing the social influence of media sources
- tools to enable students to compile an exposition supporting a viewpoint.

Students:
- analyse the effectiveness of different media presentations when attempting to influence the opinions of community members
- decide whether the eating of kangaroos is in the best interests of Australia's society, economy and environment
- prepare a media presentation to convince citizens that eating kangaroos is, or is not, in the best interests of Australia's society, economy and environment.

Kangaroo: communicating a message
L1343 – Years 5–6

In this version of Kangaroo for younger students, only the television format is presented for students to manipulate, and the number of arguments that inform the students' viewpoints is reduced.

Kangaroo: communicating messages
L1344 – Years 7–8

Students are presented with arguments in a selection of media formats regarding the contentious issue of eating kangaroos. Having considered the issue, students complete a survey in which they identify the medium that influenced them most, and state whether they are for or against eating kangaroos. They then analyse data from a fictitious survey of the Australian population and are prompted to prepare a television or newspaper advertisement promoting their viewpoint. Students are prompted to reconsider their selections if their advertisements appear to contradict their stand on the issue.

This series contains non-TLF content. See Acknowledgements in the learning objects.
Cartown series (Years 5–8)

Students consider the social, economic and environmental consequences of a traffic congestion toll and manipulate popular media to promote their viewpoint regarding the introduction of a toll during peak times in a large Australian city.

Features include:
- data comparing the social influence of media sources
- a range of media sources for students to use for synthesising facts and opinions
- tools to enable students to construct their own media reports.

Students:
- analyse the effectiveness of different media presentations when attempting to influence the opinions of community members
- evaluate whether a traffic congestion toll is a fair and effective way of reducing pollution and traffic congestion in a large city
- prepare a convincing media presentation supporting a viewpoint.

Cartown: communicating a message
L1345 – Years 5–6

In this version of Cartown for younger students, only the television format is presented for students to manipulate, and the number of arguments that inform the students' viewpoints is reduced.

Cartown: communicating messages
L1346 – Years 7–8

Students are presented with arguments, in a selection of media formats, regarding the contentious issue of introducing a congestion toll. Having considered the issue, students complete a survey in which they identify the medium that influenced them most, and state whether they are for or against the introduction of a toll. Students analyse data from a fictitious survey of the local population and are prompted to prepare a television or newspaper advertisement promoting their viewpoint.

In the television 'Media maker', students combine animation, audio and music to prepare their advertisement, while in the newspaper 'Media maker', they combine text and images in a format of their choosing. Students are prompted to reconsider their selections if their advertisements appear to contradict their stand on the issue.
Points of origin series (Years 7–8)

Students compare the prices and quality of everyday items available on the global market and identify the countries of origin from which the raw materials used in their manufacture are sourced.

Features include:
- information about the quality and price of the items.

Students:
- are presented with challenges to assemble a mountain bike, outfit of clothing or a food hamper using components sourced from countries around the world
- are provided with a choice of four countries from which they can purchase the components
- assemble the mountain bike, outfit or hamper and complete a product release form on which they summarise the origin and cost of the various elements
- return to the map of the world, where they trace the countries of origin of the raw materials used to make each item.

Points of origin: budget mountain bike
L2675 – Years 7–8

Students are challenged to select the cheapest parts to assemble a mountain bike.

Points of origin: budget outfit
L2676 – Years 7–8

Students are challenged to select the cheapest parts to assemble an outfit.

Points of origin: budget hamper
L2677 – Years 7–8

Students are challenged to select the cheapest food items to assemble a hamper.
Points of origin: quality mountain bike  
L2678 – Years 7–8  
Students are challenged to select the best quality parts to assemble a mountain bike.

Points of origin: my mountain bike  
L2679 – Years 7–8  
Students assemble a mountain bike and are free to select the components they prefer.

Points of origin: my outfit  
L2680 – Years 7–8  
Students assemble an outfit of clothing and are free to select the components they prefer.

Points of origin: my hamper  
L2681 – Years 7–8  
Students assemble a hamper of food and are free to select the items they prefer.

This series contains non-TLF content. See Acknowledgements in the learning objects.
Wind farm series (Years 7–10)

Students are presented with a range of opinions regarding the installation of a wind farm, and must evaluate their worth using factual information gathered from a range of media resources.

Features include:
- information made available to students through pop-up screens
- a notebook for students to record details, opinions and ideas
- an option to print a summary report with key recommendation, reasoning and supporting data.

Students:
- identify the advantages and disadvantages of establishing a wind farm in a coastal community
- collect, interpret and analyse data
- balance issues of ecological sustainability, economic development, social responsibility, aesthetics and lifestyle implications in determining a preferred course of action.

Wind farm: pros and cons
L898 – Years 7–8

Students investigate the pros and cons of establishing a wind farm in a small coastal community. Issues of ecological sustainability, economic development, social responsibility, lifestyle and aesthetics are considered while students determine whether to proceed with the development of a wind farm.

Wind farm: cool solutions
L1341 – Years 9–10

Students investigate the pros and cons of establishing a wind farm, with a greater emphasis in this learning object on alternative energies to address the issue of climate change. Students consider the causes of climate change and possible effects including health, environment and lifestyles.
The futurist series (Years 7–10)

Students use futures strategies to identify trends and challenges in the online distribution of music.

Features include:
- tools to enable comparison and evaluation of a range of future scenarios
- data about trends in digital music distribution for interpretation and analysis
- evidence with enough scope for a range of alternative opinions and solutions to be justified
- an option to print a student report summarising reasons for recommendations.

Students:
- identify trends and challenges in the online distribution of music
- collect, interpret and analyse data about trends in digital music distribution
- use futures strategies to determine how to achieve a preferred future for an online distribution music company.

The futurist: online music
L1340 – Years 7–8

Students meet representatives of Rebis Records, a music distribution company. The increasing popularity of online music distribution has presented Rebis Records with a dilemma: should the company invest in expensive and unproven online distribution resources, which are vulnerable to music piracy, or should they continue to distribute music on CDs?

Students collect and enter notes in their Personal Digital Assistant (PDA), which they can refer to throughout the learning object.

In a Futures Lab, students use two tools to assist them in their research. One is a teleconferencing device in which they consult experts from around the world, considering issues of piracy, encryption and digital rights management. The other is a Futures Scenario Tester, in which they enter data regarding options for music distribution and are provided with likely future outcomes.

Students compile a report for Rebis Records using the notes made in their PDA. They then present their recommendation to the staff and answer questions about their research.

The futurist: music distribution
L897 – Years 9–10

In this version of The futurist for younger learners, students follow the same process as in ‘The futurist: determining whether Rebis Records should continue to make and sell CDs, or direct their resources to online distribution. However, the focus is the future of CDs and online distribution. More complex information relating to digital rights management and encryption is not included.
GM foods series (Years 7–10)

Students compare the economic, social and environmental opportunities and potential dangers of growing genetically modified crops.

Features include:

- opportunities to identify the environmental, economic and social pros and cons of introducing genetically modified crops to the Australian environment
- arguments for and against the introduction of genetically modified food crops in Australia
- a quiz about the environmental, social and economic benefits and concerns of GM food crops.

Students:

- identify opportunities and threats of growing genetically modified food crops for Australian society, economy and the environment
- summarise arguments for and against the growing of genetically modified crops in Australia.

GM foods: pros and cons
L1024 – Years 7–8

In this version of GM foods for younger learners, students follow the same process as in the version for older learners to determine whether Max and her family should plant a GM crop. The concepts are presented in a simple and concise manner suitable for students in years 7–8.

GM foods: future choice
L948 – Years 9–10

Students are introduced to Max, a young woman whose family has grown canola for generations. Max instructs students to gather information about the pros and cons of planting a genetically modified crop.

Students visit a laboratory, trial site and farm to talk to scientists and farmers about the social, environmental and economic consequences of growing GM foods. They collect notes in which they record the pros and cons of GM foods before considering the relative importance of people's health, the environment and the economy.

Before making a final recommendation, students review some of the key points by completing a quiz. The learning object concludes when students suggest whether to plant a GM crop or not.
Fish stocks series (Years 7–10)

Students compare conflicting points of view when a ban on commercial fishing is proposed for a seaside community.

Features include:
- the means to compare, sort and analyse a variety of values and opinions regarding the regulation of fisheries in a local community
- an interactive tool allowing students to analyse information and view photos after collection
- a printable report in which students recommend a course of action and summarise the reasons for it.

Students:
- investigate the environmental, social and economic consequences of regulating commercial fishing
- compare, sort and analyse a variety of values and opinions regarding the regulation of fisheries in a local community
- recommend a course of action that will maximise the environmental, social and economic benefits of managing fish populations.

Fish stocks: two points of view
L1806 – Years 7–8

In this version of Fish stocks for younger learners, students follow the same process as in the version for older learners, although they have only two viewpoints to consider.

Fish stocks: three points of view
L1805 – Years 9–10

Students are presented with two conflicting points of view regarding the issue, and after being prompted to consider the issue further, are offered a third, ‘middle ground’ position. After investigating each viewpoint, students collect images and text to include on a customised web page on which they present their preferred position. When preparing their web page, students are prompted to reconsider their selections if they choose conflicting pieces of information.
Resort rescue series (Years 9–10)

Students consider the long-term environmental, social and economic effects of development at a beach resort over the past 15 years. They then compare the merits of different environmental management solutions and recommend and evaluate their solutions.

Features include:
- illustrations of long-term effects of environmental degradation and remediation in a coastal tourist resort
- tools to analyse the economic, social and ecological consequences of various social, economic and environmental issues
- tools to facilitate comparison of solutions that address various social, economic and environmental issues
- multiple-choice questions to test understanding of key concepts.

Students:
- explore social, economic and environmental issues in a coastal management setting
- compare the merits of solutions to problems posed about various social, economic and environmental issues.

Resort rescue: coastal protection
L2691 – Years 9–10

Students consider the long-term effects of development at a beach resort.

Resort rescue: fresh water use
L2692 – Years 9–10

Students consider the long-term effects of unrestricted use of fresh water at a beach resort.

Resort rescue: water sports
L2693 – Years 9–10

Students consider the long-term effects of motorised water sports at a beach resort.
<table>
<thead>
<tr>
<th><strong>Resort rescue: overdevelopment</strong></th>
<th>L2694 – Years 9–10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students consider the long-term effects of overdevelopment at a beach resort.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Resort rescue: off-road vehicles</strong></th>
<th>L2695 – Years 9–10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students consider the long-term effects of off-road vehicles at a beach resort.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Resort rescue: coastal protection [ESL]</strong></th>
<th>L9130 – Years 9–10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students explore social, economic and environmental issues in a coastal management setting and compare the merits of environmental management solutions. Features modified language for English as a Second Language users and an audio-supported glossary.</td>
<td></td>
</tr>
</tbody>
</table>

This series contains non-TLF content. See Acknowledgements in the learning objects.
Green machine series (Years 9–10)

Students investigate the connection between a vehicle’s features and its greenhouse gas emissions and assemble a vehicle that meets specific targets for fuel consumption. They consider the responsibilities of Australian drivers within the context of global warming and its possible effects on planet Earth.

Features include:
- links between greenhouse gas emissions, the greenhouse effect and global warming
- automatic graphs to show the relationship between fuel consumption and greenhouse gas emissions
- comparisons between the fuel consumption and greenhouse gas emissions graphs and an environmental target set by the Australian Government
- multiple-choice questions to test understanding of key concepts
- an option for students to print their green tips and reflections.

Students:
- relate a vehicle’s features to its impact on the environment
- select product components according to personal preferences
- build a vehicle that minimises fuel consumption and greenhouse emissions.

Green machine: sedan
L2699 – Years 9–10

Students build a passenger car that causes as little harm as possible to the environment.

Green machine: four-wheel drive
L2700 – Years 9–10

Students build a four-wheel drive vehicle that causes as little harm as possible to the environment.

Green machine: sports car
L2701 – Years 9–10

Students build a sports car that causes as little harm as possible to the environment.
### Green machine: luxury car
L2702 – Years 9–10
Students build a luxury car that causes as little harm as possible to the environment.

### Green machine: ute
L2703 – Years 9–10
Students build a ute that causes as little harm as possible to the environment.

### Green machine: hatchback
L2704 – Years 9–10
Students build a hatchback vehicle that causes as little harm as possible to the environment.
English and literacy

**Write an article: assessment series** *(Years 5–6)*

Students are assessed on their ability to research and write an article. They use a model structure and persuasive text to support a responsible position.

**Features include:**
- a model showing suitable text structure, features and language (including use of opinion adjectives and adverbs) used in an exposition
- a look at the importance of audience and purpose when making language choices
- definitions of difficult words
- an option to print an exposition compiled by the student
- a printable report of the student's performance.

**Students:**
- complete a factual exposition to suit the social context, audience and purpose
- revise a factual exposition to improve language choice and usage
- choose opinion adjectives and adverbs to support an evaluative stance
- interpret technical language.

**Write an article: responsible fishing: assessment**
L9769 – Years 5–6

Students research fishing in Western Australia. They look at how and why laws restrict people from taking certain fish. They identify cases where laws about size and bag limits and closed seasons apply. Students build a magazine article explaining the fishing laws.

**Write an article: fire safety: assessment**
L9770 – Years 5–6

This assessment object is in development.
World heritage: Kakadu information display series
(Years 5–7)

Students prepare an informative display about the Kakadu National Park in the Northern Territory.

Features include:
- authentic images, geographic, cultural and wildlife information about Kakadu National Park
- text structure, features and language of an information report (including grammatical and cohesive structures)
- an option to print a completed information report, including graphics
- two versions of the object, one of which includes audio support for all mentor instructions and feedback.

Students:
- identify the purpose, audience and context for an information report
- know and use cohesion, including subheadings, to organise and link ideas in a text
- use a template text structure to construct an information report
- apply verbal grammar, including a range of specialist words.

World heritage: Kakadu information display [no spoken instructions]
L4915 – Years 5–7

Using background information and descriptions in a range of texts about Kakadu National Park, students help a park ranger to sort facts and images for an information display on the park. Students read for information within the texts to enable them to group the materials thematically. Finally students use a model structure and sample text and images to build a description for visitors.

World heritage: Kakadu information display
L5813 – Years 5–7

Students look at descriptions of Kakadu National Park in the Northern Territory and help a park ranger to sort facts and pictures for an information display. They use a model structure, sample text and images to build a description for visitors.

This series contains non-TLF content. See Acknowledgements in the learning object.
Koala control (Years 5–9)
Students explore facts and opinions about controlling populations of koalas primarily by interviewing people who express a range of opinions.

Features include:
- a range of statements about wildlife management with conflicting points of view
- an option to print a summary of all opinions, including the student's personal viewpoint.

Students:
- compare the nature and strength of opinions expressed in expositions
- know and use verbs and processes indicating personal opinion
- complete cloze activities by selecting appropriate verbs and opinion adjectives
- explore the structure of an exposition and linguistic techniques used to express a point of view.

Sea chase (Years 5–9)
In the role of reporter, students join a Customs and Fisheries vessel chasing a boat suspected of fishing illegally for Patagonian toothfish.

Features include:
- feedback focusing on text structure and features
- meanings for difficult words
- an option to print students' completed report.

Students:
- identify and sort relevant data for an information report
- apply research skills of reading, categorising and grouping information
- apply textual features of pronouns, technical words, headings and subheadings to edit their information report
- engage with the issue of illegal fishing as context for text construction
- select an appropriate photo and caption for their report.
Rainforest series (Years 5–9)

Students are invited to volunteer to help protect a rainforest in south-east Australia during the tourist season. They undertake a range of activities to prepare for the trip, such as reading a brochure and choosing clothing that is suitable for the climate.

Features include:
• a series of learning objects, with each one building on knowledge gained from the previous one
• instructions for students to follow in sequence
• a glossary of difficult terms and their pronunciation.

Students:
• relate a text to their own growing knowledge and experiences
• understand how illustrations, including diagrams, tables, maps and graphs, contribute to the meaning of a text
• understand the literal and inferential meanings found in texts.

Rainforest: read a brochure
L345 – Years 5–9

Students read a six-page brochure about the climate of a temperate rainforest in Victoria, including maps of Australia showing patterns of temperature and rainfall. They find out what clothing to bring and how to get to the rainforest from the airport. Students can look up the meaning of tricky words.

Rainforest: pack for your trip
L346 – Years 5–9

Students choose the most suitable clothing for their rainforest trip from a sales catalogue. They match items from four categories: tops; bottoms; footwear; and other stuff.

Rainforest: book a flight
L347 – Years 5–9

Students travel to a national park in Victoria. They select departure and arrival locations on a map of Australia and New Zealand. Students use a timetable to book the most suitable flight and practise using 24-hour time.

Rainforest: explore the rainforest
L348 – Years 5–9

Students watch a simulated rainforest appear and grow then explore the three layers of a rainforest: canopy; understorey; and forest floor. They match labels to the rainforest layers and find hidden animals.
**Rainforest: use signs and symbols**  
L349 – Years 5–9

Students look at photos showing how a ranger has repaired damage to the rainforest caused by people. They observe examples of common symbols such as toilets, no smoking and tourist information. Students then match photos of places of interest in the rainforest with map symbols such as ferns, forest floor and wildlife.

**Rainforest: use a grid map**  
L350 – Years 5–9

Students use grid references to find places on a map. They follow instructions to find four given locations.

**Rainforest: use compass points**  
L351 – Years 5–9

Students use compass points and a scale to find places on a map. They are provided with abbreviations such as N, W, SW and E and follow instructions to find four locations.

**Rainforest: make a walking track**  
L352 – Years 5–9

Students create the route for a walking track on a map of a rainforest. They progressively choose sections of the track based on instructions about distances, compass directions and grid references until they get to the rest house.

**Rainforest: make signs**  
L353 – Years 5–9

Students make signs about four places of interest in a rainforest: temperate rainforest; forest floor; tree ferns; and tree goannas. They use sample text to build their signs: heading; opening paragraph; two facts; and a conclusion. Once they find the places of interest on a map, they take photos to add to the signs then place their signs on map locations by matching them with symbols.
Online news series (Years 5–8)

Students explore the ways in which language choices, along with various other multimodal text choices, can construct a particular evaluative stance in an online news page.

Features include:
- modelling of how language and multimodal choices construct an evaluative stance
- explanations of how each element on a web page contributes to the overall evaluative stance
- feedback in the form of text and graphs
- a glossary of difficult terms and their pronunciation
- an increasing complexity in the objects from a welcome and modelled page, to a scaffolded practice activity, to a final build section where they complete their final page of online news without step-by-step assistance.

Students:
- explore how language choices construct the evaluative stance in a text
- choose titles, sentences and images to create an online news page that supports a negative evaluative stance
- connect multimodal elements of various types of web pages
- identify how multimodal choices contribute to evaluative stance.

Online news: Green Valley Voice
L3455 – Years 5–8

Students take on the role of editor for the Green Valley Voice newspaper office. They create a page of content for the online department about a proposal to build a new dam in Green Valley. They select from a range of newspaper office resources (images and text).

Online news: Perfect Pets
L3456 – Years 5–8

Students create three online pages for a pet shop promoting three types of pets: ferrets, giant Madagascan cockroaches and hermit crabs.
Online news: island holiday
L3457 – Years 5–8
Students create three online pages for a tour company promoting three different types of holidays: action/adventure, family, romantic get-away.

Online news: Sport Scene
L3458 – Years 5–8
Students create three online pages for a weekly sports club newsletter promoting the sport and dealing with related issues.

Responsible fishing in Western Australia: write an article (Years 8–9)
Students investigate a fishing site in Australia affected by human activities.

Features include:
- definitions of difficult words
- a look at the importance of audience and purpose when making language choices
- a model of the text structure, features and language of an exposition (including use of opinion adjectives and adverbs)
- an option to print the edited magazine article for further discussion, evaluation or development in the classroom.

Students:
- choose opinion adjectives and adverbs to support an evaluative stance
- consider the audience and purpose in making their language choices
- complete a factual exposition to suit the social context, audience and purpose
- revise a factual exposition to improve language choice and usage
- interpret technical language.

Responsible fishing in Western Australia: write an article
L4914 – Years 8–9
Students are able to identify the laws and regulations that relate to fishing in this region and help write a magazine article to inform anglers of the laws and regulations they should observe. They consider evaluative and persuasive language, and use a glossary to help with difficult words.
Art and Design

**Directional design series (Years 9–10)**

Students are given a design brief to build an everyday object found at school or home that is well-suited to the built environment and that minimises negative impacts on the natural environment in which it will be used. They design the item then adapt and refine their design on the basis of client feedback.

**Features include:**
- illustrations of differences in performance of the products over a one-year and five-year period
- a mechanism for repeated testing of ideas and an interactive approach to design
- an interactive notebook to capture design specifications, user needs and stakeholder feedback
- an option to print a report completed by the student.

**Students:**
- implement core requirements for designing an everyday product, including the minimisation of negative effects on the natural environment
- investigate the complexity of designed objects and the need to understand them in the context of their actual usage
- review stakeholder requirements and adapt designs to suit.

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**Directional design: classroom chair**
L2962 – Years 9–10

The design requirement focuses on ergonomics.

**Directional design: cafeteria chair**
L3108 – Years 9–10

The design requirement focuses on hygiene and stylishness.

**Directional design: computer lab chair**
L3110 – Years 9–10

The design requirement focuses on ergonomics and durability.
Directional design: study lamp
L3112 – Years 9–10
The design requirement focuses on stylishness.

Directional design: study desk
L3114 – Years 9–10
The design requirement focuses on ergonomics, multi-use and style.
Science

Soil series (Years P–2)

Students explore the properties of natural soil environments and the interactions between the living and non-living components that contribute to healthy soil.

Features include:
- the option to look up further information and answer questions.

Students:
- explore how soil is formed from rock particles and organic matter and how plants and animals interact with the soil
- identify environmental needs of cultivated plants for survival and growth
- explore how environmental conditions affect plant growth in gardens.

Explore soil [includes spoken instructions]
L2 – Years P–2

Explore soil [no spoken instructions]
L187 – Years P–2

Students explore how soil is formed from rock particles and organic matter and how plants and animals interact with the soil.

Create a soil environment [includes spoken instructions]
L3 – Years P–2

Create a soil environment [no spoken instructions]
L188 – Years P–2

Students grow flowers or vegetables in a garden bed and compare results in different environmental conditions when adding things such as water, organic matter, digging tools and earthworms.

Soil types [includes spoken instructions]
L4 – Years P–2

Soil types [no spoken instructions]
L189 – Years P–2

Students examine the properties of three different soil types – sand, loam and clay – and explore the effects of compaction and water content on the soil.

Soil [includes spoken instructions]
L68 – Years P–2

Soil
L205 – Years P–2

Soil is an aggregated learning object combining the three other learning objects.
**Water series (Years P–2)**

Students explore the quality of water in different aquatic habitats and associate aquatic animals with their habitats according to water types.

**Features include:**
- the option to look up further information and answer questions.

**Students:**
- explore and compare water properties from a range of locations in or near a river
- associate aquatic animals with their habitats according to water types
- identify origins of water samples by comparing salinity and turbidity.

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**River journey [includes spoken instructions]**
L5 – Years P–2

**River journey [no spoken instructions]**
L190 – Years P–2

Students move Frog down a river in a boat, stopping at four locations: a creek, a waterfall, a river mouth and a bay. Using equipment in the boat, Frog can check the water at each location for temperature, salinity, clarity and current speed. At the end of the journey, students meet four different animals and predict the habitats in which they live.

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**Water types [includes spoken instructions]**
L6 – Years P–2

**Water types [no spoken instructions]**
L191 – Years P–2

Students help Gecko test water samples for salinity levels and sediment content from five different aquatic habitats: a river, the sea, a mangrove estuary, a stream and a dam. Students compare the salinity and clarity of the water samples, matching them with their original habitats.

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**Waterways [includes spoken instructions]**
L69 – Years P–2

**Waterways**
L206 – Years P–2

This is an aggregated learning object combining the two other learning objects.
Land use series (Years P–2)

Students explore human impact on the environment.

Features include:
- the option to look up further information and answer questions.

Students:
- relate planting trees and recycling paper to environmental benefits
- explore the production, use and recycling of newspapers
- link urban development to effects on wildlife populations
- explore interactions between wildlife populations and national parks, creeks, wetlands, bridges, towns and farms.

### News story [includes spoken instructions]
L15 – Years P–2

News story [no spoken instructions]
L199 – Years P–2

Students follow the production cycle of a newspaper from a forest plantation to a paper mill, to a printing press, to a newsagent, to its readers and finally to waste paper and recycling. They discover how recycling can reduce demand on natural resources.

### New developments [includes spoken instructions]
L16 – Years P–2

New developments [no spoken instructions]
L200 – Years P–2

Students explore the impact of built environments such as houses, roads and shopping centres on the natural environment. They help Gecko survey populations of mammals and birds, and explore the balance between development and wildlife conservation. Simulated environments include national parks, creeks, wetlands, bridges, towns and farms.

### Land use [includes spoken instructions]
L73 – Years P–2

Land use
L209 – Years P–2

This is an aggregated learning object combining the two other learning objects.
**Water use series (Years P–2)**

Students explore features of water in a built human environment.

**Features include:**
- the option to look up further information and answer questions.

**Students:**
- identify components of an urban water supply and wastewater system
- compare water quality at a range of points within an urban water supply and wastewater system
- arrange components of urban and rural water cycles
- explore water quality, treatment and transport within water supply systems
- identify freshwater environments where native frogs live and breed
- explore the life cycle of frogs and toads.

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**Where do frogs lay their eggs? [includes spoken instructions]**
L17 – Years P–2

**Where do frogs lay their eggs? [no spoken instructions]**
L201 – Years P–2
Students examine different bodies of water, both permanent and temporary that typically exist in the built environment and consider their suitability as a place for a frog to lay its eggs. Students investigate the sites and record their findings in a printable 'Frog report'.

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**Explore water pipes [includes spoken instructions]**
L18 – Years P–2

**Explore water pipes [no spoken instructions]**
L202 – Years P–2
Students help Frog to trace a city's water supply and disposal. They collect and test water samples from six locations: a dam, a water treatment plant, a pumping station, a house, a sewerage treatment plant and a creek outfall. They then compare the water clarity and purity, matching the samples with their original locations.

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**Where does tap water come from? [includes spoken instructions]**
L19 – Years P–2

**Where does tap water come from? [no spoken instructions]**
L203 – Years P–2
Students complete a click-and-drag jigsaw puzzle which enables them to understand the water cycle from the perspective of a household user in the country or in a city.
Surviving in a habitat series (Years 3–4)

Students explore different habitats to understand why particular plants and animals live there.

Features include:
- the option to look up further information and answer questions.

Students:
- investigate the relationships between living things and their dependence on non-living things
- identify methods for protecting living and non-living things
- observe differences between living things that suit those living things to particular environments
- investigate animals’ requirements for survival, including growth, reproduction, breathing, shelter, intake of water and nutrients.

Who lives here?
L24 – Years 3–4

Students explore a north-eastern Australian rainforest habitat for visual and sound clues about the animals that live there. They write a survey report, including observations and conclusions, and can check if their predictions are correct.

Who’s for dinner?
L25 – Years 3–4

Students examine a food chain and food web from a billabong habitat. Then, in game format, they play the role of a tadpole, a fish or a heron. The aim is to find enough food to eat and avoid predators so their animal can grow and breed.
<table>
<thead>
<tr>
<th>Learning Object</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Platypus life cycle</strong>&lt;br&gt;L28 – Years 3–4</td>
<td>Students choose their own adventure-style exploration of the life cycle of a platypus. They visit a platypus habitat and make choices to help the survival of the platypuses and their babies.</td>
</tr>
<tr>
<td><strong>Alien life form</strong>&lt;br&gt;L29 – Years 3–4</td>
<td>Students design a plant, choosing different combinations of leaves, seeds and roots so that it will survive in a specific environment (mangroves, cool rainforest, mountain slopes or arid land). They check results and receive feedback on selecting the plant features to suit the environment.</td>
</tr>
<tr>
<td><strong>Surviving in a habitat</strong>&lt;br&gt;L65 – Years 3–4</td>
<td>This is an aggregated learning object combining the four other learning objects in a sequence.</td>
</tr>
</tbody>
</table>

*Surviving in a habitat and Who lives here contain non-TLF content. See Acknowledgements in the learning object.*
Human impact series (Years 3–4)

Students explore the human influence on the environment.

Features include:
- the option to look up further information and answer questions.

Students:
- identify methods for reducing human impact on the environment
- investigate relationships between living things and their dependence on non-living things
- explore processes for preventing and rectifying environmental damage.

Old Bernie's story
L26 – Years 3–4

Students interview Old Bernie about a pond near where Bernie and his family have lived for generations. Students question Bernie about the ecology of the pond and how things have changed. Bernie replies via video clips.

Old Bernie's Pond
L27 – Years 3–4

Students help to restore Old Bernie's pond, which has been polluted and invaded by introduced species, to its original state. Students choose possible solutions for restoring the pond, check the ecological outcomes of the restoration choices, and try other options until the pond is healthy. They earn a Pond Restorer certificate.

Why recycle?
L32 – Years 3–4

Students meet a group of children finishing their lunch at school. Each school child chooses to dispose of their plastic lunch bag in a different way. Students predict where the bags might end up and the possible environmental consequences. They learn about the durability of plastics and the environmental benefits of recycling.

Earth Alert
L33 – Years 3–4

Students tune in to an environmental news program called Earth alert. They solve four ecological problems involving pest animals or human activities: domestic cats, European wasps, sea stars, and native animals killed by careless drivers. The learning object includes suggestions for solutions to an environmental problem in the students' local area.
Human impact
L67 – Years 3–4

This is an aggregated learning object combining the four other learning objects.

Energy from the sun series (Years 3–5)

Students explore the use of solar energy for cooking.

Features include:
- different design variables for a solar cooker (shape, direction and surface) and a solar oven (cover, insulation and lining).

Students:
- recognise that the Sun is a source of renewable energy
- identify surfaces that will absorb or reflect heat
- compare heat retention and insulation properties of a range of materials and container covers
- compare the concentration of solar energy captured using a range of orientations and concavity of surfaces
- compare the results of different simulations to determine the best design for a solar cooker and solar oven.

Energy from the Sun: design a solar cooker
L1140 – Years 3–5

Students design a solar cooker by selecting various characteristics for its shape, direction and surface. They can test each of the variables to determine the heat generated by the cooker when powered by the Sun.

Energy from the Sun: design a solar oven
L1141 – Years 3–5

Students design a solar oven by selecting various characteristics for its cover, insulation and lining. They can test each of the variables to determine the heat generated by the oven when powered by the sun.
Energy from the Sun: design a solar cooker and start cooking
L848 – Years 3–5

Students cook food in a solar cooker. By selecting the design settings for the cooker, students are able to find the best temperature to cook food such as soup, chicken or fish.

Energy from the Sun: design a solar oven and start cooking
L1142 – Years 3–5

Students cook food in a solar oven. By selecting the design settings for the oven, students are able to find the best temperature to cook food such as chicken, pizza or lasagna.

Energy from the Sun
L956 – Years 3–5 🌞

This is an aggregated learning object combining the four other learning objects.
Frog pond habitat series (Years 3–9)
Students investigate, gather, synthesise and evaluate data in virtual wetland environments.

Features include:
- an interactive notebook for students to record their observations about each habitat
- models of appropriate specimen collection practices which do not damage a study area
- detailed descriptions and photo or video images for each species featured
- a printable report builder which allows students to select relevant data and compile their report.

Students:
- investigate wetland habitats and sub-habitats within a pond environment and identify the features of each which make them suitable for animal life
- evaluate methods of collecting specimens from a study area according to their impact on the animal and the study area
- investigate how different animal species in a pond habitat might meet their needs for food, water, shelter or protection
- model relationships between a frog species and other organisms in a wetland environment
- identify possible causes of the decline of a frog population.

Environmental field project: frog pond habitat
L419 – Years 3–6
In this virtual field trip students explore four sub-environments of a pond environment (the pond, a grassy bank, a rocky bank, trees and shrubs). They gather data using appropriate sampling tools (magnifying glass, camera, net, fish trap, hand and bucket) and record their observations in an interactive notebook.

Environmental evaluation project: frog pond habitat
L418 – Years 5–9
Based on a real habitat, this learning object aims to immerse the students in a virtual investigation of the likely causes of decline in a frog population. Students test, analyse and synthesise a range of ecological graphic and statistical data to investigate their hypothesis as to the most likely cause of the decline of the green and gold bell frog.

This series contains non-TLF content. See Acknowledgements in the learning objects.
Energy chains series (Years 4–8)

Students explore fuel, energy and energy converters.

Features include:
- authentic photographs
- descriptions of the function of energy converters in a variety of systems for generating electricity
- options to save and print the energy chains constructed.

Students:
- arrange energy sources and converters into a logical chain to deliver electrical energy
- review the energy chain they constructed.

**Energy chains: build an energy chain**
L2353 – Years 4–6

Students build an energy chain for a coal-fired power station. They find out about fuel and how the energy converters work. Students examine the type of energy change that happens in each converter. They arrange converters into the correct sequence so that the energy in fuel can be delivered as electricity.

**Energy chains: make electricity**
L2354 – Years 4–6

Students build up to six energy chains that produce electricity. They select from different energy sources and choose energy converters to match.

**Energy chains: side effects**
L2355 – Years 4–6

Students build energy chains that make electricity and examine the waste products and side effects that occur with each converter. For example, find out the environmental effects of using water to generate electricity in hydroelectric systems.

**Energy chains: power up!**
L2356 – Years 5–8

Students build energy chains to power appliances and vehicles. They find out about energy sources and how energy converters work then select the energy converters that suit each source and vehicle.

**Energy chains: energy use**
L2357 – Years 7–8

Students select energy sources and energy converters
to build energy chains to power appliances and
vehicles. They examine how each energy converter in
a chain loses some energy and reduces the energy
available for use.

Shaping the land series (Years 5–10)

Students explore the ongoing and dynamic processes (deposition, folding, faulting, erosion, intrusion) that interact to form and reshape the Earth's crust.

Features include:
• cross-sections models of the Earth's crust and images of actual geological landforms

Students:
• model the geological processes that interact to form and reshape the Earth's crust
• understand the geological processes of deposition, folding, faulting, erosion, intrusions, and extrusions
• describe the geological history of model landforms by examining geological cross-sections and modelling actions of forces
• describe the geological history of real landforms by examining photographs and modelling actions of forces on geological cross-sections.

Shaping the land: geological forces
L534 – Years 5–10

Students explore cross-section models of the Earth's crust. They understand how landforms are shaped over time by applying geological forces: deposition of sediments, folding, faulting, igneous intrusions and erosion.

Shaping the land: model landforms
L535 – Years 5–10

Students model the geological processes that interact to form and reshape the Earth's crust.

Shaping the land: real landscapes
L536 – Years 5–10

Students work out a sequence of geological events on model landforms to match real landscapes.
Shaping the land
L533 – Years 5–10

This is an aggregated learning object combining the below three learning objects in a sequence.

Shaping the land: model landforms: assessment
L9837 – Years 8–9

Students examine geological forces: deposition of sediments, folding, faulting, igneous intrusions and erosion. They work out a sequence of geological events to match example landforms.

Shaping the land: real landforms: assessment
L9836 – Years 8–9

Students demonstrate their understanding of geological events that interact to form and reshape the Earth's crust. They create the correct sequence of events to match an example cross-section of the Earth.

Shaping the land: real landscapes and Shaping the land contain non-TLF content. See Acknowledgements in the learning objects.
The colour of water series (Years 7–10)

Students explore and experiment with the conditions found in various bodies of water to understand the impact these conditions will have on the colour of the water.

Features include:
- reference information on local areas.

Students:
- use a controlled environment to explore the different factors that can affect the colour of water
- ask a local about environmental conditions and effects on water life
- replicate environmental conditions in an ‘experitank’ to match the water colour with the water sample colour provided
- are challenged to correctly match the water conditions that occur in various bodies of water around Australia and New Zealand.

The colour of water: Experitank
L562 – Years 7–10

The colour of water: Experitank [no spoken instructions]
L563 – Years 7–10

Students vary temperature, salinity or the micro-organisms present plus other variables to discover the impact these have on water colour.

The colour of water: Blue Lake
L564 – Years 7–10

The colour of water: Blue Lake [no spoken instructions]
L565 – Years 7–10

Students look at a lake in New Zealand that appears blue.

The colour of water: Green Lake
L566 – Years 7–10

The colour of water: Green Lake [no spoken instructions]
L567 – Years 7–10

Students look at a lake in New Zealand that appears green.

The colour of water: Pink Lake
L568 – Years 7–10

The colour of water: Pink Lake [no spoken instructions]
L569 – Years 7–10

Students look at a lake in Australia that appears pink.
<table>
<thead>
<tr>
<th>Learning Object</th>
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</tr>
</thead>
<tbody>
<tr>
<td>The colour of water: park pond</td>
<td>L570 – Years 7–10</td>
</tr>
<tr>
<td>The colour of water: park pond [no spoken instructions]</td>
<td>L571 – Years 7–10</td>
</tr>
<tr>
<td>Students look at a pond in Australia that appears brown.</td>
<td></td>
</tr>
<tr>
<td>The colour of water: Jervis Bay</td>
<td>L572 – Years 7–10</td>
</tr>
<tr>
<td>The colour of water: Jervis Bay [no spoken instructions]</td>
<td>L573 – Years 7–10</td>
</tr>
<tr>
<td>Students look at a bay in Australia that appears white and shiny.</td>
<td></td>
</tr>
<tr>
<td>The colour of water: Freycinet Peninsula</td>
<td>L574 – Years 7–10</td>
</tr>
<tr>
<td>The colour of water: Freycinet Peninsula [no spoken instructions]</td>
<td>L575 – Years 7–10</td>
</tr>
<tr>
<td>Students look at an ocean off Tasmania that appears red.</td>
<td></td>
</tr>
<tr>
<td>The colour of water: Great Barrier Reef</td>
<td>L576 – Years 7–10</td>
</tr>
<tr>
<td>The colour of water: Great Barrier Reef [no spoken instructions]</td>
<td>L577 – Years 7–10</td>
</tr>
<tr>
<td>Students look at ocean water around the Great Barrier Reef that appears blue.</td>
<td></td>
</tr>
<tr>
<td>The colour of water</td>
<td>L560 – Years 7–10 🌊</td>
</tr>
<tr>
<td>The colour of water [no spoken instructions]</td>
<td>– Years 7–10 🌊</td>
</tr>
<tr>
<td>This is an aggregated learning object combining the other learning objects.</td>
<td></td>
</tr>
</tbody>
</table>
Wind power series (Years 9–10)

Students explore the conversion of wind energy into electricity.

Features include:
- two simulations to test wind generators
- options to look up further information and answer questions

Students:
- maximise the power output and energy efficiency of a windmill at a range of wind speeds
- explore the design of wind-powered generators.

It’s not just wind
L49 – Years 9–10

Students test design settings for a windmill that is to generate electric power for an island lighthouse. They set the angle and pitch of the windmill blades to suit wind speed for each season. They try to maximise energy efficiency of the windmill operation while minimising the back-up use of diesel fuel for power generation. They predict and test the setting that results in the minimum use of fuel over one year.

Check your wind
L50 – Years 9–10

Check your wind extends the activities contained in It’s not just wind. Students are asked to determine the best locations in Australia and New Zealand for locating wind generators.

Wind power
L77 – Years 9–10

This is an aggregated learning object combining the two other learning objects in a sequence.
Content from other sources

The place that's right for me (Years P–4)

Students explore a range of Australian environments and examine the adaptations of the animals to their habitat.

Features include:
- a range of Australian environments to explore: eucalypt forest, hollow log, river bank and desert.

Students:
- explore the needs of native animals and relate them to body structure and function
- explore the basic features of native animals by designing animals using different body parts.

The environments include eucalypt forest, hollow log, river bank and desert and the native animals include kookaburra, wombat, frog and lizard.
Rainforest life series (Years 5–8)

Students help a scientist carry out field work, identify specimens and explore ecological interactions in a rainforest environment.

Features include:
- worksheets for activities on insect identification, examining plants and animals, and detecting starch.

Students:
- explore the characteristics of a range of rainforest animals and plants, including feeding patterns and cell structure.

| Rainforest life: identifying living things  
L3079 – Years 5–8 |
<table>
<thead>
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<tbody>
<tr>
<td>Students explore the characteristics of a range of rainforest animals and plants. They identify and classify insects. Students explore photosynthesis in a flowering plant and label the parts of a dicotyledon flower.</td>
</tr>
</tbody>
</table>

| Rainforest life: interaction with living things  
L3080 – Years 5–8 |
<table>
<thead>
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<tbody>
<tr>
<td>Students explore the feeding patterns of a range of rainforest animals and plants. They build food chains and food webs and classify organisms as producers, first order consumers or second order consumers. Students measure and record data using a thermometer, hygrometer and rain gauge.</td>
</tr>
</tbody>
</table>

| Rainforest life: looking at cells  
L3081 – Years 5–8 |
<table>
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<tbody>
<tr>
<td>Students examine cell structure and the function of organelles within unicellular organisms. They explore characteristics of protists and compare them with characteristics of animals and plants. Students compare the operation of light, transmission electron microscopes and scanning electron microscopes.</td>
</tr>
</tbody>
</table>
**Feral peril (Years 5–8)**

Students help a scientist carry out field work, identify specimens and explore ecological interactions in a rainforest environment.

**Features include:**
- multiple-choice questions to test understanding and score points in a game scenario.

**Students:**
- explore the ecology of introduced species in Australia
- explore the impact of introduced species on native animals and plants.

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**Ecosystem balance (Years 5–10)**

Students explore the characteristics and ecology of Tasmanian plants and animals. Students explore the impact of a change in population of a range of species on other animals and plants.

**Features include:**
- descriptions of plant and animal species.

**Students:**
- explore the characteristics and ecology of Tasmanian plants and animals
- explore population interactions in three Tasmanian ecosystems: a dry forest, a rainforest and a seaweed community
- compare how population changes in a range of species affect other animals and plants.
Eco series (Years 6–10)

Students explore the balance between biodiversity and economic return in primary production. They manage the environment to achieve sustainable production while preserving biodiversity.

Features include:
- ecological details on different areas, animal species and habitats
- yearly statistics on economic return and effects on biodiversity
- descriptions of different types of logging and the effects of each on biodiversity and economic return
- information on old-growth and regrowth forests and biodiversity within them
- a report showing the outcomes of the student's decisions.

Students:
- distinguish between old-growth and regrowth forests
- connect environmental factors to the survival of animal species
- identify the beneficial roles of natural vegetation and watercourses in maintaining biodiversity.

Eco forest
L10764 – Years 6–10

Students take on the role of forest manager. They learn about the biodiversity of the forest and the animals that live there. They choose the best method of sustainably logging the forest to balance the survival of five particular animal species with the need for jobs in the local community.

Eco farm
L10765 – Years 6–10

Students take on the role of farm manager. They learn about the different habitats and communities found on farmland and make decisions about the management of four areas on the farm (cropped and grazed paddocks, woodland remnants and dams and creeks) to increase profits while improving biodiversity.
EagleCat: plants (Years 8–12)
Students explore the optimum growth conditions for five different Australian plants.

Features include:
- five simulated Australian biomes in which students can test hypotheses about which plants are best adapted for a particular biome
- a mechanism to record experimental data and print it out
- a research challenge idea for students to investigate.

Students:
- manipulate variables of temperature, soil moisture and salinity and observe the effects on plant growth for five different plants
- collect data on plant growth and test hypotheses about which plants are best suited to particular biomes.

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Greenhouse (Years 11–12)
Students use a greenhouse model to examine why the Earth's temperatures are relatively steady.

Features include:
- an exploration guide
- data displayed in table, bar chart and graphic form
- five summative multiple-choice assessment questions with printable results and explanations of correct answers
- an option to copy and print the activity screen.

Students:
- observe daytime's rising temperature and the falling temperature at night, along with heat flow in and out of the system
- investigate the causes of global warming.

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Life science: greenhouse effect
L8977 – Years 11–12
Students monitor the Earth's daily energy inflows and outflows. Students can vary the amount of greenhouse gases present in the atmosphere to simulate global warming and investigate the long-term effects.

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**Germination** *(Years 11–12)*

Students explore the impact of environmental factors on germination rates of different seeds.

**Features include:**
- data, displayed in table and graphic form
- an exploration guide
- five summative multiple-choice assessment questions with printable results and explanations of correct answers
- an option to copy and print the activity screen.

**Students:**
- manipulate a number of environmental factors to determine their effect on how seeds germinate.

**Life science: seed germination**

L8978 – Years 11–12

Students run a series of experiments for each seed, varying the temperature, water and light levels in the germination chamber. Students identify which conditions produce the highest germination rate for each seed type.

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**Food chain** *(Years 11–12)*

Students explore how changes in the populations of species that are part of a food chain affect an ecosystem.

**Features include:**
- five summative multiple-choice assessment questions with printable results and explanations of correct answers
- data displayed in table and graphic form
- an option to copy and print the activity screen
- an exploration guide.

**Students:**
- examine an ecosystem consisting of hawks, snakes, rabbits and grass.

**Life science: food chain**

L8979 – Years 11–12

Students manipulate disease and population numbers in the ecosystem. They examine the resulting effects over time.
**Digital resources**

A remarkable range of digitised items licensed from leading Australian and New Zealand cultural and scientific institutions is also available to support *Environmental education for sustainability*. These items include:

- clips from documentaries, newsreels, television programs and feature films
- photographs, line drawings, maps and documents
- audio files of interviews, broadcasts and speeches.

With each item, TLF supplies an *educational value statement* comprising a description and contextual information which enriches the value of the asset for the teacher or student.

Two views of each resource are available – one with the Description, educational value statement and acknowledgments, another with the resource and acknowledgments. For example:

**View 1 – Resource and acknowledgements**

![Rabbit fence cartoon, 1884](image)

TLF ID: R9214

Reproduced courtesy of State Library of Queensland. Published by The Queensland Figaro.

**View 2 – Resource, description, educational value statement and acknowledgments**

![Rabbit fence cartoon, 1884](image)

TLF ID: R9214
Theses images and film clips licensed from some of The Learning Federation's partner institutions provide other opportunities for students to explore economic knowledge, understandings, values and issues.

<table>
<thead>
<tr>
<th>Image</th>
<th>Description</th>
</tr>
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</table>
| ![Eucalypt bark and bushfires, 2000](Reproduced courtesy of CSIRO. Written and directed by Marianne Latham. Produced by Nick Pitsas, CSIRO.) | **Eucalypt bark and bushfires, 2000**  
This is a clip about predicting the spread of bushfires based on the types of Eucalyptus in the Australian bush. The behaviour of bushfires is influenced by factors such as fuel characteristics, atmospheric conditions and topography. Scientists are attempting to build models that can quickly predict bushfire behaviour based on these factors. An important goal is to develop reliable computer-based models so that communities and firefighters in fire-prone areas can manage fire hazards more safely by being able to predict the speed and direction that the bushfires will spread. |
This photograph shows a Japanese whale hunt. During the five months of the 1992–93 season of the Japanese scientific whaling program in the Antarctic, the Japanese Institute of Cetacean Research allowed British freelance filmmaker Mark Votier to see the Japanese whaling fleet in operation. During that time Votier recorded 30 harpoonings. |
| ![Murray River in crisis, 2008](Copyright Newspix / Brett Hartwig. Photograph by Brett Hartwig.) | **Murray River in crisis, 2008**  
This photograph shows an aerial view of part of the lower lakes system near the mouth of the Murray River in South Australia. Normally, the riverine area to the right of the barrages would be a huge series of freshwater lakes and the water levels of the lakes would be maintained by the barrages at about 75 cm higher than the salt water seen centre left. However by August 2008 drought and excessive pumping of river water upstream had depleted the flows and exposed the area to the risks of habitat destruction and acidification. |
| **TLF ID:** R8909 | **Landline – Ethanol Special, 2006: 'Clean, green and healthier'**<br>This clip shows the health risks of petrol- and diesel-driven vehicle fuel exhausts within a context of advocating the biofuels ethanol and biodiesel. Professor Ray Kearney speaks about research into the health dangers of fuel exhausts. |
| **TLF ID:** R6579 | **'Life and Death on the Great Barrier Reef', 2002 – item 1**<br>This photograph of a crown-of-thorns starfish on a coral reef in the Great Barrier Reef off northern Queensland was taken in 2002 during the shooting of the documentary film *Muddy waters – life and death on the Great Barrier Reef*. The crown-of-thorns starfish seen here has been identified as a serious threat to the coral reefs of the Great Barrier Reef. It is one of the oceans’ most efficient coral predators, eating the delicate coral polyps. By 2030, half of the Great Barrier Reef may be gone. |
| **TLF ID:** R3382 | **Chris Arthur recalls the Franklin River campaign, 2008**<br>This is an edited recording of an interview with Chris Arthur, a Tasmanian environmentalist, who describes being arrested in December 1982 after participating in a blockade of a site linked to a proposed project to dam the Franklin River in south-western Tasmania. Arthur and other members of the Tasmanian Wilderness Society blocked access to the dam site after the Tasmanian Government had announced that it would dam the Franklin River in spite of federal opposition and divided public opinion. |
| **TLF ID:** R3594 | **Forest clear-felling, c1905**<br>This photograph depicts clearing of Australia’s natural environment by European settlers. The photograph shows an extensive forest of large trees that would be difficult to find today. In the 200 years since European settlement, about 60 per cent of Australia’s forests and woodlands have been destroyed. |
Synthesising natural compounds for cosmetics
This clip shows a CSIRO scientist talk about synthesising a compound from sharks that is used successfully in acne lotions. Many people object to the harming of animals to extract materials for human use, especially when the product is not closely connected to human survival. Synthesising natural animal compounds in a laboratory may be an alternative to sourcing ingredients from animals.

An innovative solar energy panel
This solar panel contains a layer of nanocrystals, or quantum dots, of copper-indium-gallium-diselenide (CIGS). The panel is being twisted to display its high flexibility. Standard electricity towers can be seen in the background.

Early monitoring of ozone depletion and global warming, 2004
This is a colour clip about the early monitoring of ozone depletion and global warming. The clip shows a computer-generated model of the Earth, and a CSIRO scientist talking about greenhouse gases and their effect on climate change. It shows aerial shots of the Cape Grim Baseline Air Pollution Station in north-west Tasmania.