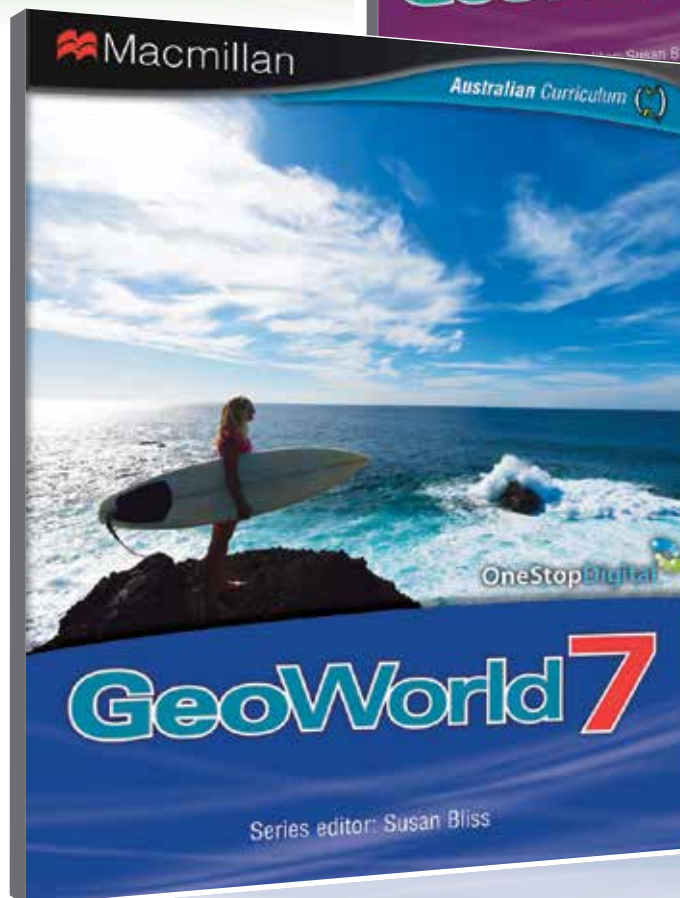
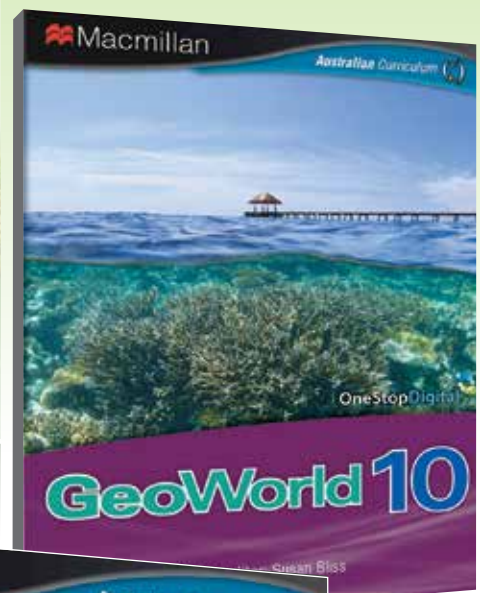
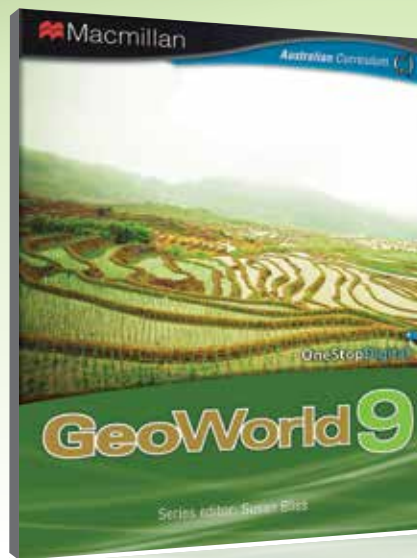
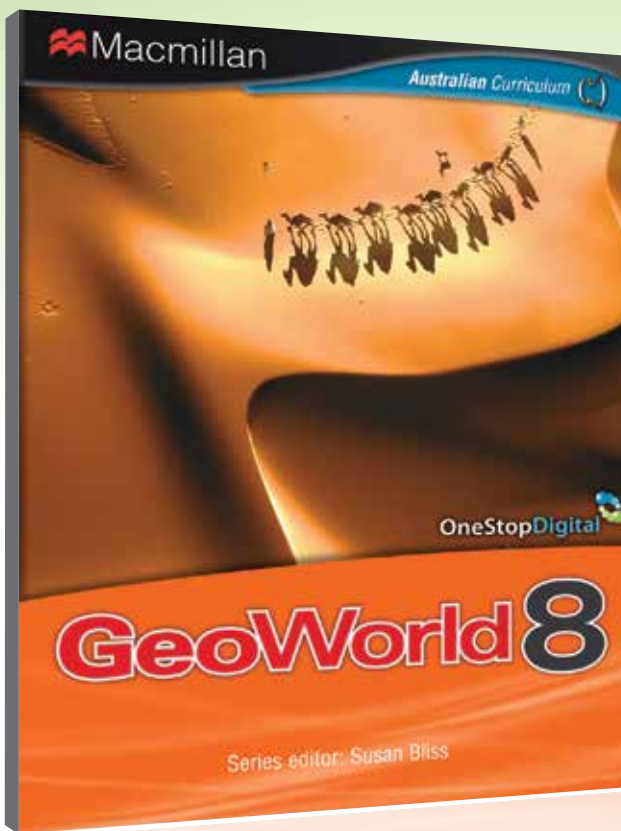


# GeoWorld

for the  
Australian Curriculum



A world of  
learning about  
**people,**  
**places** and  
**environments**

# GeoWorld

for the **Australian Curriculum**

Series editor: Susan Bliss

## A world of learning about people, places and environments

### Specifically written for the Australian Curriculum: Geography.

The fresh approach to study in **GeoWorld** will equip students with geographical skills and general capabilities that can be applied in daily life and at work.

These energetic texts focus on 7 key concepts stipulated in the curriculum.

Inquiry-based activities assist students develop an appreciation of different perspectives in geographical knowledge, an understanding of ethical research principles, experience in teamwork, and critical and creative thinking.

The student-centred content is embedded with cross-curriculum priorities throughout, and is well supported by a wealth of engaging resources that provide a sense of place.

### Features:

- powerful images and succinct introductions hook students' attention
- activities to extend or support individual students
- the latest geographical data and issues
- easy-to-use double-page spreads with vivid images, maps and creative info-graphics.





## 1.12 Ocean garbage patches: misuse of water



Every year 7 billion kilograms of rubbish such as cardboard, plastic cups, bottles and cans are dumped into the ocean. Leaking containers of radioactive waste and nerve gas disposed at sea contaminate fish and cause death to consumers. Medical wastes wash up on beaches, while a 3000-passenger cruise ship produces 8 tons of solid waste a week.

The top five marine debris items are: cigarettes (28%), plastic bags (12%), plastic food wrappers/containers (8%), caps and lids (8%) and plastic beverage bottles (6%).

### Great Pacific garbage patch

The Pacific, Atlantic and Indian Oceans are important environmental resources but are threatened by floating garbage—90% of which is plastic. Over 18000 pieces of plastic per square kilometre bob around in oceans and is consumed by 44% of seabirds and 267 marine species.

The Great Pacific Garbage Patch, located in the North Pacific Ocean, was formed by slow swirling ocean currents called gyres. These currents move garbage from the coasts of Asia and North America towards the centre of the ocean, referred to as the 'patch'. It is difficult to clean up, because 'out of sight and out of mind' mentality pervades most organisations. What's more, micro-plastics released by synthetic clothing during washing ends up in the oceans, where it enters the marine food chain.

### Plastic from petroleum

Petroleum is vital for the production of nail polish, lipstick, synthetic clothing fibres and plastics. All these consumer goods require water. About 8% of the world's annual oil production is used to manufacture plastic. Due to its low cost and ease of manufacture, 33% of plastic is a 'single life product'. The average plastic bag is used for 12 minutes and only one in 200 is recycled. What a waste of water!



self-sufficient  
double-page spreads

student-centred  
content

## Environmental resources and water

When the last tree has died and the last river is poisoned and the last fish been caught will we that we cannot eat money.



Elephant shower in Kerala, India

Earth is a huge storehouse of environmental resources, classified as continuous (e.g. sun, tide, wind and geothermal), renewable (e.g. soil, plants and animals) and non-renewable (e.g. oil). Regardless of where we live, everyone requires air to breathe, soils to produce food, forests to generate oxygen, and water to drink. Water also can be classified as continuous (e.g. water cycle), renewable (e.g. river is constantly fed by precipitation) and non-renewable (e.g. overexploitation of fossil groundwater).

Everyday, everywhere, living things require water to survive. Humans depend on water to drink, grow food and mine minerals for computers, cars and drones. Farmers depend on water to irrigate crops, and industry requires water to produce energy from fossil fuels.

Sustainable management strategies aim to reduce the huge human-water footprint to maintain healthy ecosystems. Otherwise, future generations will be unable to enjoy drinking clean water—a fact of life we now take for granted.



### Think, puzzle, explore

- **Place** Why does the quantity of water consumed vary between places?
- **Space** Why does geothermal and tidal power vary over space?
- **Environment** What are the impacts of overuse of water on the environment?
- **Interconnection** How is water and energy interconnected?
- **Sustainability** How can humans sustainably manage garbage floating in the ocean?
- **Scale** How large is the human water footprint and why does it vary at different scales (local, national and global)?
- **Change** How are changes to food wastes and food miles connected to water?



### Geoskills in focus

- **Observing** water use, misuse, overuse and sustainability using the inquiry process
- **Collecting and analysing** relevant geographical data on water
- **Concluding** different perspectives on the use and management of water resources
- **Communicating** ideas using web 2.0 tools, graphs, maps, statistics and photographs
- **Reflecting** on actions to ensure a sustainable water supply

always available e.g. sun, wind, water, air, and land. Renewable resources are found in all countries, generally located in coastal areas, generally located in coastal areas, generally located in coastal areas.

**environmental resource:** resource occurring naturally within environments: atmosphere (air), lithosphere (land, soil, minerals), hydrosphere (rivers, oceans) and biosphere (plants and animals)  
**fossil fuels:** non-renewable resources such as coal, oil and natural gas  
**Geographic Information System (GIS):** system for capturing, storing and analysing data about Earth  
**inquiry process:** six stages in a geographical investigation

**non-renewable resource:** resources formed slowly—often over millions of years—and once used cannot be replenished in the short-term, e.g. gold, diamonds, coal  
**renewable resource:** resource replenished in a relatively short period of time, e.g. plants and animals  
**sustainability:** ongoing capacity of Earth to provide sufficient quantity and quality water to maintain human and environmental life now and in the future  
**water footprint (WF):** volume of fresh water used to produce the goods and services consumed by humans



Humans produce 20 times more plastic than 50 years ago. Asia accounts for 30% of the global consumption followed by North America (26%) and Western Europe (23%). Plastic degrades slowly in landfills, but on the other hand it does make cars lighter so they require less oil and emit less CO<sub>2</sub>. Some plastics are biodegradable and break down upon exposure to water, sunlight, bacteria or algae.

Australians consume 4.5 billion plastic bags each year. Biodegradable plastic bags and paper bags are alternatives to plastic bags but have other

environmental problems. The Say-NO-to-Plastic Bags campaign contributed to 45% reduction in plastic bags provided by supermarkets over the past few years.

### GeoInfo

Enough plastic bags are produced every year to circle the planet four times.

	Paper bag	Compostable** plastic	Recyclable bag
Municipal waste	33.9kg	1.28kg	4.7kg
Water	1004 gallons	672 gallons	40 gallons
Electricity	649mJ*	325mJ	148mJ
Fossil fuels	922mJ	1219mJ	457mJ

\* Compostable: 90% biodegradation of plastic bags within 180 days in compost

\*\*mJ: millijoule is a unit of energy

#### 1.12.2 Impact of different bags (per 1000 bags)

### Geoactivities 1.12

#### Knowledge and understanding

1. Explain how rubbish ends its life in the ocean – an important water resource.
2. List the advantages and disadvantages of plastic.
3. Describe the links between water and plastic.
4. Discuss how individuals, retailers and companies could reduce the use of plastic and as a result conserve water.

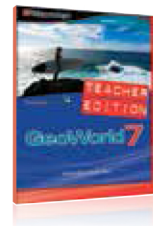
#### Inquiry and skills

5. List the top five marine debris items.
  - a. Draw the data as a column graph.
  - b. Design an advertisement showing how these five items can be reduced.
6. Refer to 1.12.1.
  - a. What is the latitude and longitude of the Great Pacific Garbage Patch?
  - b. Why is it hard to find the exact location of the Great Pacific Garbage Patch?
  - c. How large is the patch?
  - d. What is the source of the rubbish?
  - e. How long does a disposable diaper (nappy) take to photo degrade?
7. What are the impacts of plastic on marine and bird species?
  - a. Why are ocean patches difficult to clean?
8. Refer to 1.12.2.
  - a. What are the advantages of plastic bags over paper bags and vice versa?
  - b. What are the advantages of recyclable bags over paper and plastic bags?
  - c. Compostable bags sound environmentally friendly as they self destruct after a few months. Explain their problems.
9. Inquiry task: Research how many plastic bags you use in your home over a week. Report the statistics back to the class. Collate class statistics. Analyse the results. Suggest solutions to reduce their use.
10. ICT: View satellite imagery showing ocean deserts online. What is meant by an 'ocean desert' and how does it impact on other environmental resources?
11. Research the organisation Save the Plastic Bag on the internet. What is its aim and how effective is its campaign?

## Components



### Print & Digital Student Resources



### Print & Digital Teacher Support

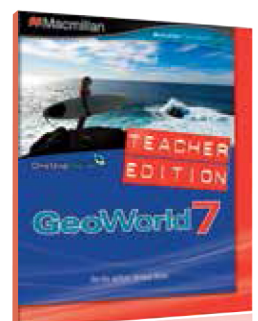
focuses on  
Geographical knowledge  
and understanding

emphasises on  
Geographical inquiry  
and skills

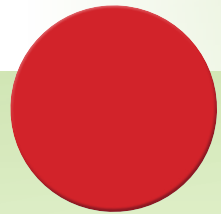
## Teacher Support

Comprehensive print and digital support for teachers includes:

- ready-to-go lesson plans
- activities to extend or support individual students
- hands-on projects to spark motivation
- suggested answers
- fieldwork activities
- marking rubrics
- editable teaching program.



# ...a world of digital possibilities



Available on any device, on any platform, at any time 24/7, **GeoWorld** is supported by a wide spectrum of digital activities and resources.



Each **GeoWorld** student book comes with 15 months access to an **interactive digital version of the text** and powerful digital support. Digital only resources are also available.

This amazing support includes:

- a markbook, allowing students to join a virtual class and foster teamwork and collaboration
- up-to-date weblinks for quick and easy access to information
- auto-marking diagnostic quizzes
- interactive crosswords
- weblinks to animations and learning resources.

## Macmillan's digital home

[www.onestopdigital.com.au](http://www.onestopdigital.com.au)