



MESSAGE IN A PLASTIC BOTTLE

A cross-curriculum guide to reducing plastic waste

Years 7 – 10 / Mathematics / Science / English / Geography / Leadership



ACKNOWLEDGMENTS

Waste Wise Schools is a program of the Waste Authority.

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WASTE WISE SCHOOLS PROGRAM

The Waste
Wise Schools
Program

supports schools in WA with educational strategies for reducing waste to landfill by implementing the 3Rs, 'reduce, reuse, and recycle', while developing positive environmental values in students and the whole school community.

Waste Wise Schools is a program of the Waste Authority and offers resources and support for schools to plan, implement and maintain waste minimising projects such as recycling, composting and worm farming.

The program helps schools to set up infrastructure and provides resources aimed at changing attitudes and behaviour in regard to sustainable waste management.

The program is free and available to all schools in Western Australia.



Students at Emmanuel Catholic College collect mobile phones for recycling.

Becoming a Waste Wise School

The first step to becoming a Waste Wise School is to attend an introductory workshop. The workshop will provide you with important waste information and statistics, inspiring case studies, waste minimisation project ideas, curriculum linked resources and valuable support through the accreditation and grant process. Workshops are held regularly throughout the year in both metropolitan and regional areas. Webinars are also available and allow schools to access information when a workshop is not available in their area.

To join the program or to find out when the next workshop or webinar will be held, contact the Waste Wise coordinator on (08) 6467 5167 or email wastewise@der.wa.gov.au.

The benefits of being a Waste Wise School include free resources and support including:

- a waste audit with the Waste Wise incursions officer (Perth only) or a kit to run your own audit
- Waste Wise accreditation
- workshops
- staff presentations at your school
- curriculum linked resources
- presentations with student leadership groups
- assistance to set up projects such as worm farms and compost
- access to grant funding to implement Waste Wise projects.

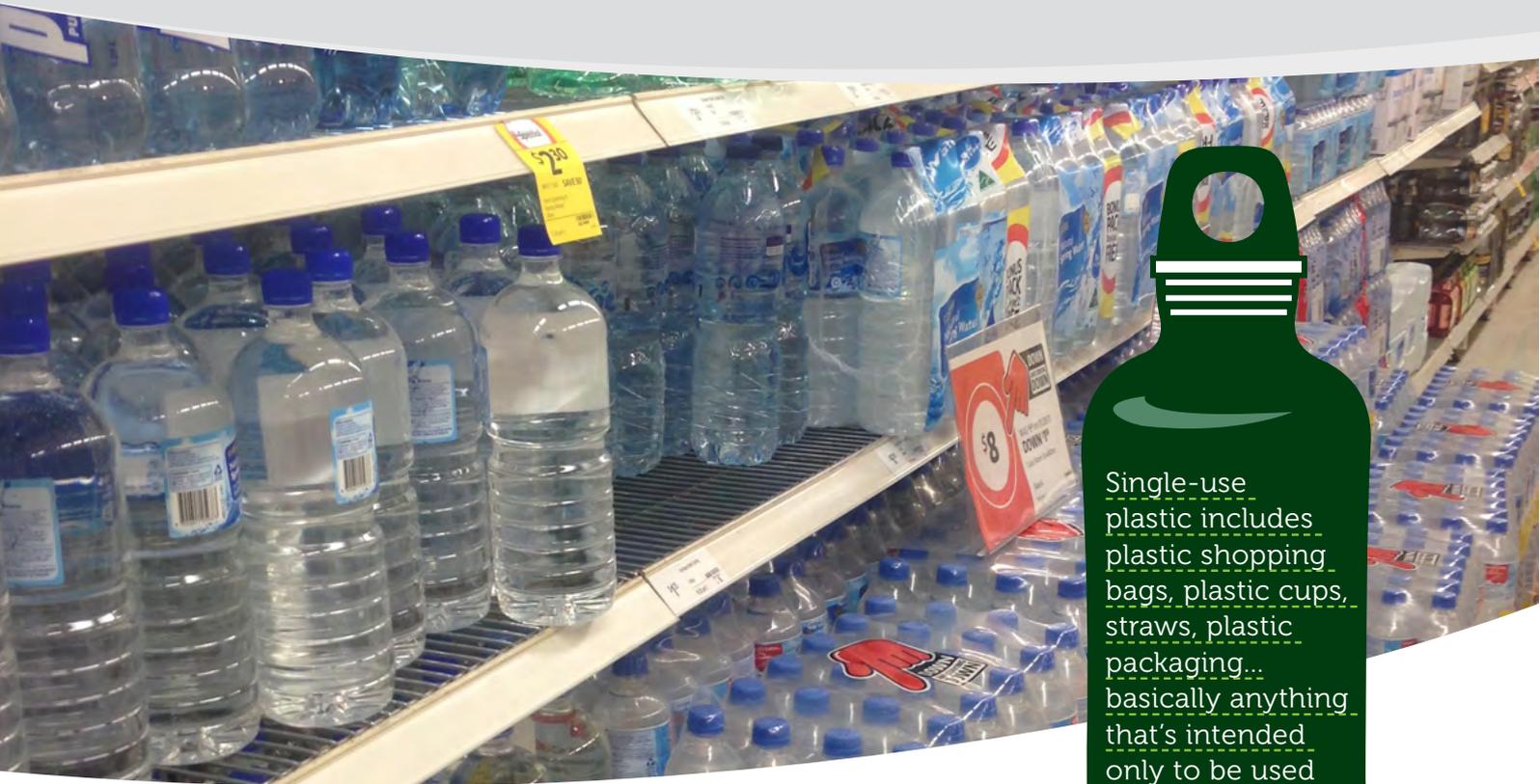


Australian
Sustainable Schools Initiative
A Partnership of the Australian Government, the States & Territories

Please visit the Waste Wise Schools website for more information about the program www.wasteauthority.wa.gov.au/programs/waste-wise-schools.

Waste Wise Schools is a proud member of the WA Australian Sustainable Schools Initiative Alliance. Through being involved with the Waste Wise Schools Program schools can take action to reduce their ecological footprint and increase their social handprint. For more information visit the Department of Education website, www.det.wa.edu.au/curriculum-support/sustainableschools/detcms/portal.





Single-use plastic includes plastic shopping bags, plastic cups, straws, plastic packaging... basically anything that's intended only to be used once and then discarded.

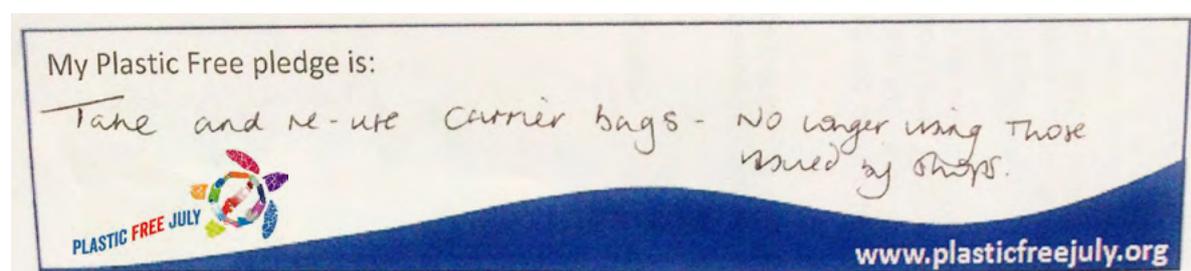
BOTTLED WATER BACKGROUND INFORMATION

Why study bottled water?

Bottled water is a product that students are familiar with and can relate to. Bottled water has been marketed to create a feeling of desire and need even though clean tap water is readily available in Australia. Many students consider bottled water as a healthy alternative to soft drink and some may also believe it's a safer choice than drinking tap water.

This bottled water unit encourages students to question their understanding and assumptions of bottled water including cost,

the waters' source, how it is marketed, the plastic waste it creates and how that plastic waste is disposed of. We hope that by looking at the issue from multiple angles and in different learning areas the students will come to the same conclusion as we have; that bottled water is a wasteful product and that we should reduce our consumption of it. The topic of bottled water also provides a platform to discuss reducing our use of other types of single-use plastics like straws and plastic bags. The leadership section gives students an opportunity to take action by pledging to reduce single-use plastic waste.



A student from Mindarie Senior College pledges to take her own bags and no longer use those supplied by shops.

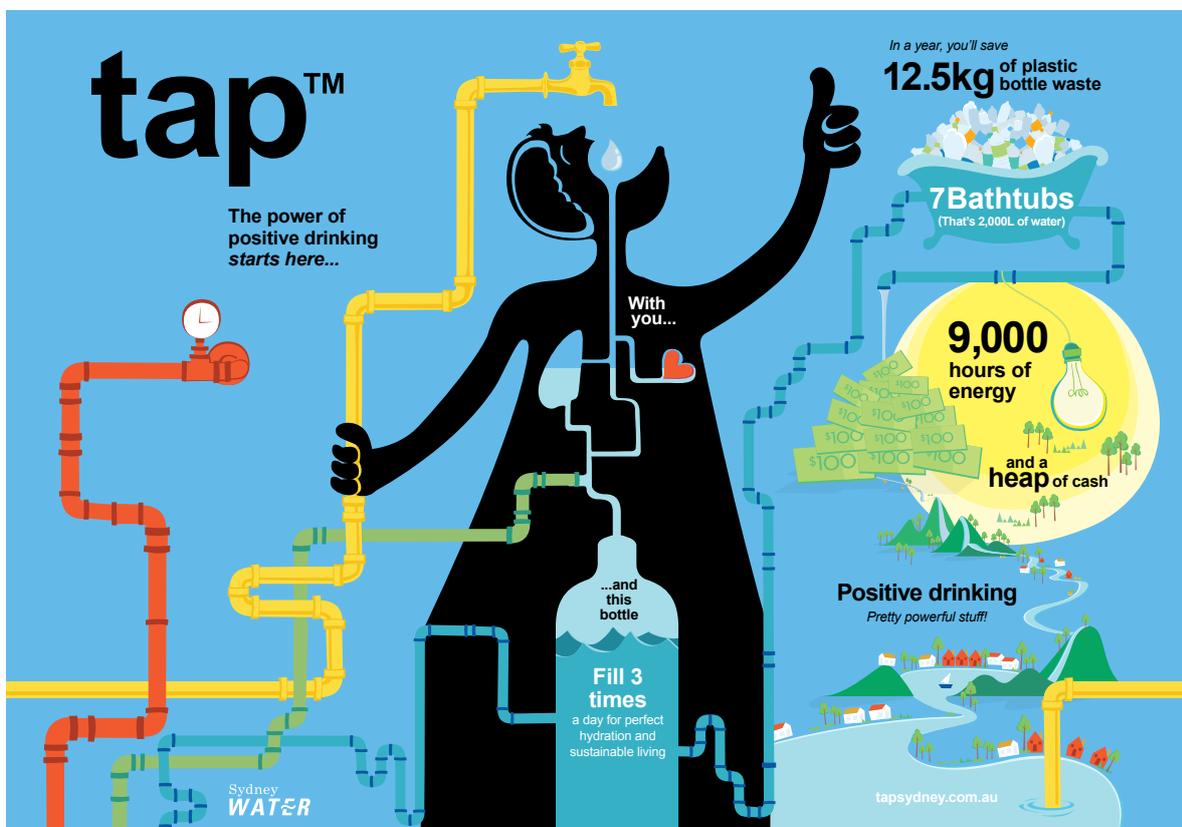


Image provided by Sydney Water.

Bottled water statistics

Water, soft drinks, juice and other drinks are commonly sold in polyethylene terephthalate, commonly known as PET, plastic bottles. In 2011/12 Australia consumed over 116,000 tonnes of PET plastics. In Australia, the recycling rate for this type of plastic is around 53 per cent with the remainder going to landfill. Of the PET that is recycled, more than three-quarters is exported for recycling because we don't have the capacity in Australia to recycle all of the plastic waste we produce (2011/12 National Plastics Recycling Survey, PACIA).

When it comes to bottled water:

- Australians spend more than half a billion dollars a year on bottled water

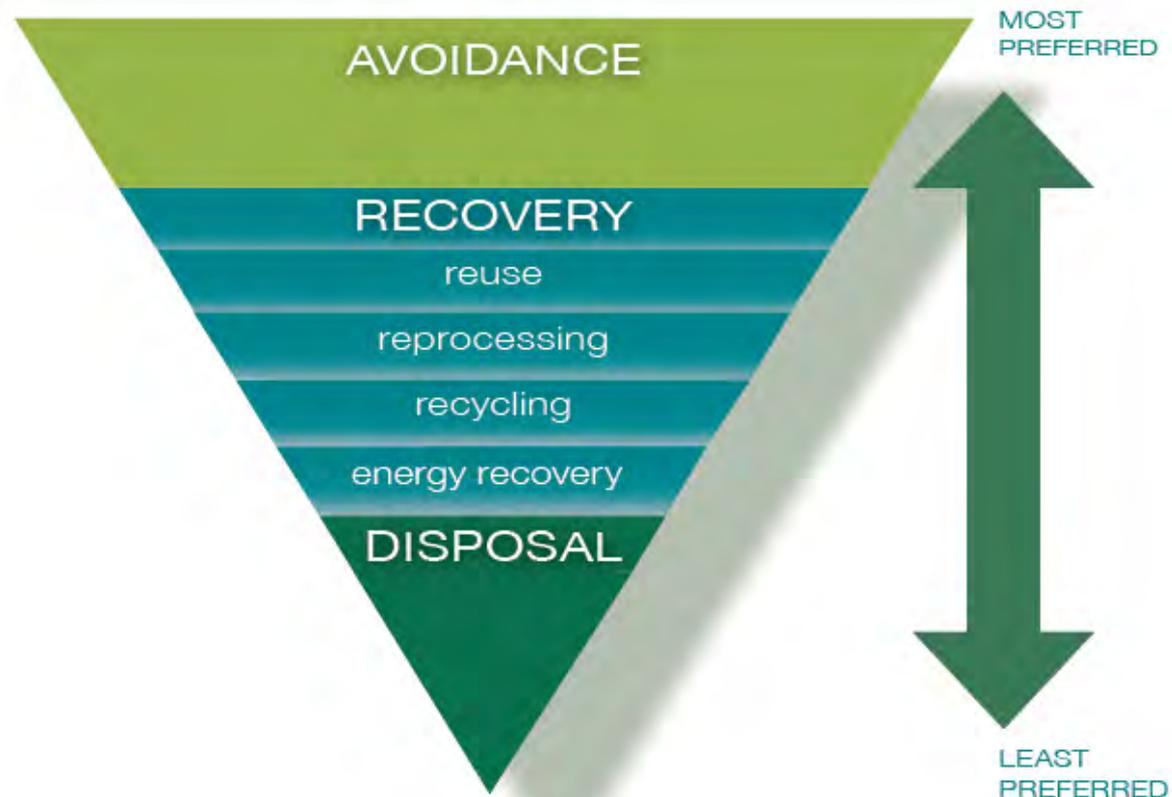
- Australia produced 582.9 million litres of bottled water in 2009/10
- producing and delivering a litre of bottled water can emit hundreds of times more greenhouse gases than a litre of tap water
- a litre of bottled water is often more expensive than a litre of petrol
- it is estimated that more than 145.7 million litres of oil was used in the production, transportation, refrigeration and recycling or disposing of bottled water in Australia in 2009/10.

Source: Do Something, Go Tap campaign <http://dosomething.net.au>.

More bottled water facts are available at: www.cleanup.org.au/PDF/au/clean_up_australia_bottled_water_factsheet.pdf.

Avoiding waste is the highest priority

We often justify our decision to buy a product like bottled water by telling ourselves that the packaging can be recycled. Recycling makes us feel good and while recycling is more desirable than sending PET plastic to landfill, it is important to consider the environmental impact of transporting our recyclables long distances and the energy and resources required for processing. The best option is to avoid buying single-use plastics like water in a bottle by carrying your own reusable bottle.





Visitors to Perth city can reduce plastic by filling up with filtered still or sparkling water.

Inspiring stories about reducing plastic

There are many inspiring stories of individuals, organisations and towns that are reducing their use of plastic. This is a brief summary of some of our favourites.

- **Bundanoon:** The Australian town of Bundanoon, in the NSW Southern Highlands, has decided to neither sell, nor giveaway, bottled still water, within the town precinct www.bundyontap.com.au.
- **Monte Sant' Angelo school:** Monte Sant' Angelo Mercy College banned the sale of bottled water at the canteen in 2010 and installed filtered water fountains for the students www.smh.com.au/environment/water-issues/sale-of-water-is-banned-and-thats-just-lubbly-bubbly-20100727-10uer.html.
- **Plastic-free July:** Plastic-free July began in Perth and encourages people to pledge to reduce their consumption of single-use plastic in July. In 2014, more than 14,000 people from 69 nations around the world participated in refusing single-use plastic, www.plasticfreejuly.org.
- **City of Fremantle:** In 2014 the City of Fremantle voted on a new law to ban retailers from providing single-use plastic bags www.abc.net.au/news/2014-07-24/fremantle-votes-to-ban-plastic-bags-for-a-second-time/5619920.
- **City of Perth:** In 2013 the City of Perth trialled water fountains that supply fresh, filtered still or sparkling water www.perth.wa.gov.au/newsroom/featured-news/australian-first-perth-trials-public-drinking-fountain-alternative.

Plastic-free swaps

This plastic bottle guide is designed to get your students thinking about the broader issue of single-use plastic. We've put together some simple swaps so you and your students can make more sustainable choices at home and at school.



Fruit and vegetable bags - take your own reusable cloth bags to buy fruit and vegetables.



Cling wrap and snap-lock bags - pack sandwiches in reusable containers or use a sandwich wrap.



Plastic bottles - take your own drink bottle everywhere you go.



Other drinks - try making your own juices to take with you or buy a freshly squeezed juice in a reusable cup.



Plastic bags - take your own bag shopping.



Coffee cups - take your own reusable coffee cup.



Straws - Say 'no thanks' to straws.



Packaging - there are some great places in Perth where you can purchase items from bulk bins without any packaging. Simply take your own bags and use these stores to stock up on nuts, seeds, dried fruit, flour, pasta, cereal, spices and more.

PLASTIC BOTTLE CURRICULUM GUIDE



Overview

In this guide you will find a set of activity instructions for each learning area plus a leadership activity, snippets of inspiration cards and a quiz. The table below provides a brief overview of the key activities undertaken by each area.

Subject	Suitable for	Description of activities
English	Years 7 - 10	Students watch <i>The Story of Bottled Water</i> and use this as inspiration to write a persuasive speech that encourages teachers and students to stop buying bottled water.
Maths	Years 7 - 10	Students compare bottled water and tap water by calculating: <ul style="list-style-type: none"> • the distance water travels by tap and bottle • the cost of tap water compared to bottled water • the amount of plastic waste their school produces and how much it costs to dispose of it.
Science	Year 7 - 8	Students carry out a scientific investigation on the properties of bottled and tap water including taste, odour, pH, fluoride, chlorine and pesticides.
Geography	Years 9 - 10	Students conduct an inquiry project and investigate the impacts of the production and consumption of bottled water. They study the supply chain and life of the product (including plastic recycling, disposal to landfill and litter that ends up in the ocean).
Leadership	Years 7 - 12	The leadership activity provides instructions to help students to launch their own campaign to encourage their school community to stop buying bottled water (and other plastic products) for a day, a week or a month.
Snippets	Year 7 - 12	Twenty snippet cards designed to inspire your students to choose a topic and develop their own project on bottled water. The links range from discussion points to investigations and are designed to complement the activities developed for English, maths, science and geography.
Quiz	Year 7 - 12	The bottled water quiz features multiple choice questions. It is a useful tool to engage the whole school and could be done as a form activity, at year group meetings or at a school assembly.

All activities are linked to the Australian Curriculum. Full details of the links are provided at the end of each subject's activity instructions.

Using bottled water as a cross-curriculum unit

This guide is designed to be used as a cross-curriculum unit with all subject areas looking at the topic of bottled water from different angles. Subjects can do the activities in isolation but the lessons will have greater impact if more learning areas are involved. In addition, there are opportunities for sharing across subject areas and year levels. To help with cross-curriculum planning, we've highlighted a few ways that subject areas can share their learning with one another.

	English	Maths	Science	Geography	Whole school
English		Invite a maths class to share calculations (e.g. cost comparison of bottled and tap water). This could be used in persuasive speeches.	Invite a science class to share investigation results. Results could be used in persuasive speeches.	Invite a geography class to share research on impacts of production and consumption. This research could be used in persuasive speeches.	Share one of your student's persuasive speeches at an assembly.
Maths	Invite an English class to debate which is more persuasive, statistics or language, in convincing people to drink tap water (extension activity).		Invite a science class to share their results and have your class produce graphs (on taste and odour preferences).	Invite a geography class to share their research on cost of bottled water and where it comes from (Inquiry question 1) or to share graphs and statistics on bottled water (e.g. How much PET plastic is recycled?).	Share the school survey results in the newsletter or at an assembly.



By tackling bottled water as a cross-curriculum topic we hope to have a greater impact on students' learning and aim to see students taking positive action to reduce their use of plastic.

	English	Maths	Science	Geography	Whole school
Science	Invite an English class to share taste tests results for additional analysis or invite an English class to present persuasive speeches to highlight why tap water is a better choice.	Invite a maths class to share their results on the cost and distance travelled by bottled water.		Invite a geography class to share what happens when plastic ends up in the ocean (inquiry question 6).	Share the investigation results online or at an assembly.
Geography	Invite an English class to present persuasive speeches including actions we can take to reduce plastic waste (Inquiry question 7).	Invite a maths class to share their research on cost of bottled water and where it comes from (Inquiry question 1).	Invite a science class to share what happens when plastic ends up in the ocean (Inquiry question 6).		Share some of the students' research including suggestions about how to reduce our use of plastic.
	If your class is creating an online jigsaw such as Padlet, other subject areas could have their own page to make contributions.				
Leadership	The leadership students could visit classes or talk at assembly and encourage students to make pledges to reduce plastic.				



Content versus skills

Some subject areas, like geography and science, lend themselves well to the topic of sustainability and bottled water because the topic can be addressed directly through the curriculum content (such as the impact of production of goods). We have found, however, that subjects such as English and maths are just as valuable because the topic of sustainability can be addressed through skills such as persuasive writing or data collection and analysis. These skill-based subjects have very strong curriculum links and the activities for these subjects are more easily adapted to meet the curriculum needs across a range of year levels.

Linking to other subjects

We haven't written activity instructions for all learning areas, however, you might choose to expand on the topic of bottled water to include more learning areas. Here are a few curriculum-linked suggestions for other subjects:

- History: Students could look at the history of bottled water. Many of the brands have a long history associated with healing properties and spa resorts. The history of bottled water is covered well here: <http://researchbank.swinburne.edu.au/vital/access/manager/Repository/swin:14906>.

Year 10 students could look at how the history has strongly embedded bottled water in our popular culture and design advertisements (print or digital) to try to bring back the tap as a form of popular culture. Alternatively, Year 10 students could look at the environmental movement.

- Visual Art: Watch the National Geographic documentary on how scientists and artists collaborate on an Alaskan voyage. Their goal is to create art from the plastic debris they find and raise awareness about its impact on oceans and wildlife <http://video.nationalgeographic.com.au/video/141204-gyre-video-complete>.

Alternatively, study the work of environmental artist John Dahlsen at www.johndahlsen.com or www.youtube.com/watch?v=DfVi01FZD5I.

You will find other great links and ideas in the snippets section of this document.



Students at Lynwood SHS make a pledge to reduce plastic by using reusable containers instead of cling wrap.

Using leadership to take action

We have provided a leadership activity so that students can take positive action from their classroom learning. The leadership activity helps students to launch their own campaign to encourage students to stop purchasing bottled water (and other plastic products) for a day, a week or even a month. The campaign encourages staff and students to make a pledge to reduce their use of single-use plastics like bottles, straws, plastic bags and coffee cup lids.

The instructions are simple and suitable for students to follow with, or without, the direction of a teacher. Having the support of a teacher is likely to lead to greater success with the project.

The leadership activity could be completed by:

- a student leadership team
- a group of inspired students (perhaps from a number of different year groups / learning areas)
- a class of students
- a gifted and talented student group
- school staff.

Sharing the bottled water project with your school community

Here are just a few ways you can engage your school community in the bottled water message:

- get your class to present at an assembly
- put photos and stories in the newsletter
- put up display boards with photos and plastic-free pledges
- get your class to produce a poster to display around the school
- use some of the bottled water facts from the background information as daily announcements
- conduct a quiz in mentor groups or form (a quiz is available as part of this package).



The Sydney Zoo encourages visitors to drink tap water too.



To print or not to print? We would love your class to reduce waste by not printing activities, discussion questions and worksheets. Consider using electronic whiteboards, projectors, whiteboards and other shared displays for the activities provided. If you do decide to print, try sharing handouts, working in groups and use double-sided printing or reused paper where possible.