

Lesson 1: Waste and Recycling

Which bin does it go in?

NetWaste Teacher Resource for primary schools

Teacher overview

Australia is one of the top ten largest producers of household (municipal) waste per person in the world. (Source: OECD, 2014, Municipal Waste, OECD Data <https://data.oecd.org/waste/municipal-waste.htm>) On average, Australians produce more than half a tonne of household waste per person, per year and most of this waste is sent to landfill.

When waste is sent to landfill, it can stay buried underground, for tens, hundreds and even thousands of years before it decomposes and, even then, some items will never breakdown. Due to a lack of oxygen, the decomposition of putrescible (organic) waste in landfill occurs under anaerobic conditions, creating methane; a greenhouse gas approximately 24 times more potent than carbon dioxide as a heat trapping gas within the atmosphere. Decomposing waste, when combined with rainwater, also produces leachate, a nutrient-rich liquid pollutant that can be potentially damaging if allowed to escape into groundwater supplies. While landfills are currently necessary, they are very expensive to build and require ongoing management and monitoring to ensure they do not cause any detrimental impact to the environment.

The Waste Hierarchy (pictured) is the internationally recognised framework for prioritising waste and resource management practices. Since all waste management options have some impact on the environment, the only way to avoid an impact is not to produce waste in the first place. This is why waste avoidance and reduction are considered the most preferable options in the hierarchy. Reuse, followed by recycling, while disposal to landfill is considered the least preferable waste management option and is listed at the bottom of the hierarchy.



NetWaste Councils provide a fortnightly kerbside recycling collection service in addition to the weekly general waste service. This service encourages residents to sort their waste and separate their recyclables from their non-recyclables, reducing the amount of waste that goes into landfill every year. These recyclables are collected and taken to a Materials Recovery Facility (MRF) where they are sorted and weighed ready for reprocessing. Manufacturing new products from recyclable materials not only preserves natural resources, but also helps to conserve energy and reduce pollution. Placing non-recyclable items in the recycling bin (e.g. plastic bags, food scraps, garden waste, batteries etc.) is called contamination and can cause a number of issues at the MRF and during reprocessing. More information on NetWaste Councils recycling service is available on the NetWaste website: <http://www.netwaste.org.au/recycle-it/>

We all have choices when it comes to the way we generate and dispose of waste materials. Considering waste as a resource and changing our waste management behaviours can reduce our environmental footprint, creating a more sustainable future.

Note: This lesson outline is suitable for delivery to all primary school year levels. Teachers can extend or simplify the content and activities to suit the age and ability of their students.



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Learning Outcomes

- Recognise and identify recyclable and non-recyclable materials and know which materials should be placed in which bin
- Learn basic compliance with the kerbside recycling system
- Understand what a landfill is and what happens to waste materials once they are disposed of in a landfill
- Understand what happens at a Materials Recovery Facility (MRF) and what happens to recyclable materials at the MRF
- Introduction to the Waste Hierarchy and familiarity with terminology such as avoid, reduce, reuse and recycle

Lesson Outline

To be used in conjunction with the Waste and Recycling PowerPoint presentation (PPT)

Waste to landfill

- Refer to slides 2 and 3. Ask students to think about how much they throw away. Do they throw things away once a month, once a week or at least once a day? If everyone in Australia is doing the same thing, then this leads to a lot of rubbish being created. So what happens to it?
- Refer to slide 4. Introduce the term landfill. Explain that all the rubbish from the general waste bins end up in a landfill. Ask students to think about what happens to the rubbish once it goes into the landfill.
- Refer to slide 5. Ask students to think about whether the rubbish would just disappear when it is buried underground or what else might happen to it.
- Refer to slides 6, 7 and 8. Briefly describe how a landfill works and what impacts landfills have on the environment. As populations grow and more waste is generated and disposed, this puts added pressure on landfills. Have a class discussion about what might happen once the landfills are filled?

Reduce, Reuse and Recycle

- Refer to slide 9. Introduce the concept of the Waste Hierarchy and the terms avoid, reduce, reuse, recycle. See if the students can give a definition or examples for each of these words. Write these definitions and examples on the whiteboard.
- Refer to slide 10. Ask students to suggest why they think it is better to reduce, reuse or recycle than send waste to landfill.
- Refer to slide 11. NetWaste Councils provide a fortnightly kerbside recycling collection service in addition to the weekly general waste service. Ask students what colour is the lid on their recycling bin at home and what else they know about their recycling service. Some communities have a lime green lidded bin that they can place all their food scraps and garden waste in to be collected and turned into compost. Ask students if anyone has one of these at home.
- Refer to slides 12 and 13. Discuss with students which items are suitable for recycling and which are not (utilising a bag of clean recyclable materials as props can be useful for this exercise). Include some tips on how to become a recycling legend e.g. no soft plastic that can be scrunched in the hand (films, bags) just rigid plastic bottles and containers; items must be empty of liquids and food scraps; and remove lids wherever possible.



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- Refer to slide 14. Introduce the term contamination. Ask students to identify or state what items cannot be recycled and can contaminate the recycling bin? For example, nappies, plastic bags, food scraps, ceramics and clothing.

Materials Recovery Facility

- Refer to slide 15. Where does the truck take your recycling and what happens to the recyclable materials?
- Introduce the term Materials Recovery Facility (MRF) and explain that all the recyclable materials are transported to the MRF where the recyclables are sorted by hand and by machine into separate material types before being baled up ready for reprocessing into new materials. Reiterate why it is so important that only the correct materials are placed in the recycle bin.
- Refer to slide 16. Ask students to think about why recycling materials is better than sending these materials to landfill. Introduce the term 'closing the loop'. Reveal some of the new things that are made from everyday recyclable items.

Summarise the presentation: using focus questions, ask students to identify things they have learned and clarify their understanding of key terms and concepts.

Accompanying lesson resources

- PowerPoint presentation - Waste and Recycling- Which bin does it go in?

Additional recommended resources

- Mixed bag of clean recyclable materials
- Mixed bag of clean, non-recyclable waste items as examples of contaminants
- Mixed bag of rigid plastic containers and bottles

Activity suggestions

1. Recycling Relay (outside area)

Students split into two teams. Each team has a bag containing mixed recyclables and general waste. A student from each team grabs an item from the bag, walks to the finish line and chooses whether to place their item in the green box (waste bin) or yellow box (recycling bin). The student then walks back to the start and the next student goes. The winning team is the one that finishes first but only if they have segregated the materials correctly.

2. MRF Worker: Who's the fastest?

Students work in small groups to sort and segregate the waste items from the recyclables in the quickest time. (Optional: Students can be given work gloves, a hi-vis vest and safety glasses for a more authentic sorting exercise).



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3. Pass the Waste Parcel

Students sit in a circle with a green box (for general waste) and a yellow box (for recycling) in the centre. The students pass around a series of recyclable items and general waste items.

When the facilitator shouts 'stop' the students with a piece of rubbish have to get up and place it in the correct box.

4. Lucky Dip

Students reach into a 'lucky dip' bag (made up of recyclable and non-recyclable items) and pull out an item. They must decide whether the item they have can be placed in either the recycling bin or waste bin. As an extension activity, students can also see if they can identify what natural resource/s were used to make the item e.g. paper from trees, plastic bottle from oil etc.

Teacher's note:

The Recycling Relay, Pass the Waste Parcel and Lucky Dip are all activities on the same theme. The most appropriate activity can be selected depending on the students' age, size of group, time availability and access to outside area.

Suggested activity resources

- Selection of clean recyclable and non-recyclable items (approx. 30 items- enough for one per student)
- Suitable receptacles to act as waste and recycling bins e.g. red and yellow storage boxes or hoops.
- Work gloves, hi vis vest and safety glasses (optional)