

LET'S GET SORTED

AND BEAT CONTAMINATION

Waste Audit Teacher's Guide



CAMPBELLTOWN



Part 1 - Background

Integrating waste and resource recovery education and waste reduction practices into every aspect of school life not only benefits our environment, it also helps schools reduce wastes produced at school and improves quality of life for the community.

The majority of waste generated in schools is made up of lunch packaging, paper and cardboard, recyclables and food waste.

For many schools, much of the waste generated at school goes to landfill, which is the least desirable option for the management of waste. Landfills in Sydney are filling up at an alarming rate, and if current waste disposal rates continue, there are concerns about the sustainability and long-term impacts of this disposal method.

The Waste Hierarchy of avoid, reuse and recycle is the basis for people referring to the 3 R's – reduce, reuse, recycle. The 3 R's have now been extended to the 5R's – Refuse, Reduce, Reuse, Repair and Recycle, and are designed to get people thinking about the waste they create and where their waste goes after they dispose of it. As landfill capacity continues to shrink, and Australia moves towards valuing waste as a resource within a circular economy, there is an urgent need to rethink the waste we generate and how this waste is disposed of.

Due to the sheer number of people within the school community, and the subsequent waste that is potentially created, schools are in a great position to significantly reduce the amount of waste ultimately sent to landfill.

In addition, as the epicentre of the community, schools have an opportunity to send home lessons learned from a waste audit activity, which has the potential to create a widespread positive impact on the way the local community thinks about and handles its waste.

This School Waste Audit Guide is designed to help schools carry out their own waste audit. This guide provides a range of tools to assist in preparing for an audit, undertaking the audit, and taking practical action to reduce the amount of waste created and sent to landfill.

Waste Hierarchy

When people talk about waste there is usually a reference to the waste hierarchy. The waste hierarchy is similar to the food pyramid: the pointy end reflects the least preferable option for waste management, and the most preferable option is represented at the wider end.

The highest priority in the hierarchy is avoiding and reducing the generation of waste, encouraging the community, industry and government to reduce the amount of raw materials extracted and used. The goal is to maximise efficiency and avoid unnecessary consumption.

The second priority is resource recovery when avoidance and reduction of waste is not possible.

This includes:

- Reuse of materials without further processing – many household items can be repaired, reused, sold or donated to charities.

- Recycling – materials are reprocessed into the same or different products to keep the materials in the productive economy for as long as possible and decrease the need for new materials.
- Recovery – if reuse or recycling is not feasible, recovery of waste material for energy is another option, and provides a solution that is preferred over landfill.

Lastly the hierarchy recognises that there are some waste types, such as hazardous chemicals or asbestos, that cannot be safely recycled, and therefore direct treatment or safe disposal is the most appropriate option for dealing with this waste.

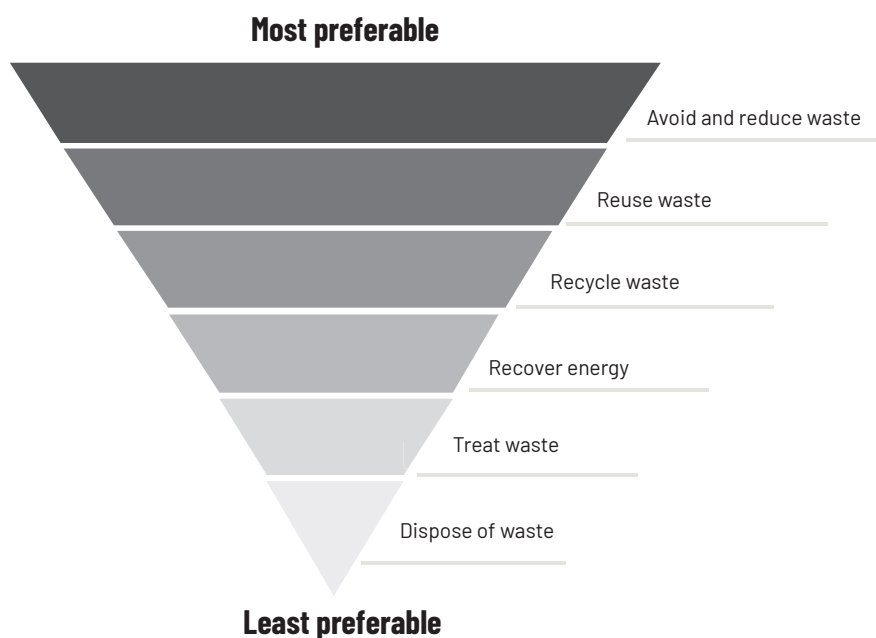
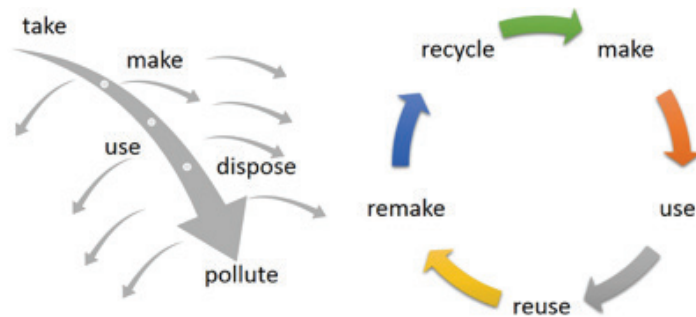


Figure 1: The Waste Hierarchy. NSW EPA. NSW Government

Future of Waste

Circular Economy

A circular economy is an approach that moves away from the linear economy of 'take, make and dispose'. The system is regenerative by design, keeping resources circulating in our economy for as long as possible to maximise value and minimise waste. This means that items that are currently disposed of can be re-built, redesigned or re-purposed and given a new life instead of going to landfill.



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Linear Economy compared with Circular Economy



Waste to Energy

Waste to Energy (WtE) or Energy from Waste (EfW), refers to a process of converting residual wastes into energy such as heat, electricity, or liquid transport fuels.

WtE can form a vital part of a sustainable waste management chain, is fully complementary to recycling, and is already part of the global move towards implementing circular economy.

Materials such as clean plastics, paper and cardboard (placed in the yellow lidded bin) can be recycled, and organic and green waste (collected in the green lidded bin, where this option is available) can be revalued through composting or anaerobic digestion processes. Currently in Australia, the most common resource that can be extracted from general

waste (red lidded bin) sent to landfill is methane (landfill gas), which can be used to generate electricity. By comparison, diverting material to WtE plants for energy recovery can provide better environmental outcomes based on the waste hierarchy design.

This is an area of waste management that is becoming more well-known and more widely discussed across Australia. Whilst it is unlikely to provide any short term answers in regard to the waste audit and management of waste generated at school, it is certainly an interesting discussion point for students, and will be an important consideration for waste management in the not too distant future.

Phasing out problematic plastic waste

Phasing out problematic plastic waste is one of the targets identified in the National Waste Policy Action Plan 2019.

Plastic products and packaging are some of the main contributors to plastic waste in the environment, particularly in our oceans. Once plastic enters the environment it never disappears, it simply breaks down into smaller and smaller fragments, impacting aquatic life.

Business and industry groups are developing a priority list of problematic and unnecessary plastic packaging as part of delivering on the National Targets. This list will support a national plastics plan, which will include working with the Pacific region to ensure firm and collective action to reduce the amount of plastic used, and the amount ending up in our rivers and oceans.

The waste audit process will identify how big a problem plastic waste is for your school. Part of the audit and the action plan that follows will allow students to find ways to address their plastic waste now, while the government and industry work on the bigger issue across Australia and the Pacific Region.



What is waste? and where does it go?

Waste can be defined in many ways, just one example is 'a resource with a yet-to-be-determined use'. For example, an apple core, a plastic food container and a pair of shoes that no longer fit may all be considered waste, but that does not mean they have to be put in the rubbish bin. An apple core can be composted, a plastic container can usually be recycled and an old pair of shoes could be given to a charity organisation or simply to a brother, sister or friend.

There are a number of places we put our waste, including the rubbish bin, recycling bin, compost bin or taking to a charity for reuse. Unless a school has arranged a recycling service, the waste that goes into the bins around the school (playground, classrooms, etc) is usually sent to landfill.



What is landfill?

A landfill is a location where disposable materials (rubbish) are sent. There, the rubbish is buried underground to remove it from sight. It is done in a way that aims to prevent any of the rubbish coming into contact with and potentially contaminating any groundwater or affecting any of the surrounding environment. Although there are a lot of new technologies that exist in the modern day landfill, the concept of burying our rubbish is one of the oldest forms of waste disposal and is still one of the most common practices of waste disposal in the world.

What is a waste audit?

A waste audit is an evaluation of the waste produced by the school that is being sent to landfill.

Conducting a waste audit allows your school to discover two things:

1. How much waste your school produces
2. What type of waste is produced

This information provides a starting point to begin your journey of waste minimisation in your school by highlighting some important questions, such as:

1. What are we sending to landfill that can actually be recycled, composted or reused?
2. How can we reduce the amount of waste we create?
3. How can we increase the amount of materials we recycle?

The information gathered becomes a valuable measuring tool to be used as a baseline for making changes to waste management and resource recovery at your school.



What are the benefits of doing a waste audit?

There are many benefits to carrying out a waste audit in your school. A waste audit can benefit the environment, can educate students and staff on the global issue of waste management, and help to make your school a happier and healthier place.

Helping The Environment

There are a number of environmental problems connected with landfill:

1. Land clearing to build landfills may cause loss of biodiversity and habitats.
2. Windblown waste from the landfill may allow litter to enter waterways or the bushland and could affect native fauna.
3. Leachates or toxic liquids from products such as batteries and old paint may contaminate the soil and ground water (if the landfill or tip isn't lined with a protective barrier).
4. Social impacts that may occur from the unpleasant nature of the landfill including smell, noise, vermin and appearance.
5. Burying resources that are valuable such as recyclables and compostable material.
6. Greenhouse gases, such as methane gas, are produced by organic waste as it decays within a landfill. Methane (CH₄) is about 25 times stronger than carbon dioxide (CO₂) (1kg of CH₄ is equivalent to releasing 25kg of CO₂), and its continued release into the atmosphere contributes to global warming and climate change – (see <https://climatechange.environment.nsw.gov.au/About-climate-change-in-NSW/NSW-emissions/Greenhouse-gas-accounting>) So, if we can reduce the amount of waste going to landfill, we are doing a great thing for our climate!

Reducing Your School's Waste!

A waste audit provides information about the types and quantities of waste produced at school, and can provide opportunities to reduce or capture some of that waste before it reaches the landfill bin. Implementing new practices could reduce the amount of waste being created within the school community.

Makes your school a healthier and happier place

When you reduce the waste your school creates and sends to landfill, you are not only helping to create a healthier planet, but also a healthier school.

Activities to improve school waste habits could include:

- Hosting 'nude food' or 'waste free' lunch days to reduce single use plastic consumption
- Review the canteen menu and switch to more whole foods and reduce pre-packaged food where possible
- Create a composting or worm farming system that in turn encourages the development of a veggie garden
- Encourage healthier eating habits in the home
- Sessions on how to make home-made snacks to reduce soft plastics and individually wrapped snack items in lunch boxes

A waste audit can also help students to discover how important their role is in helping reduce global pollution by tackling a local issue, and this in turn can increase community and environmental stewardship.



part 2 - pre-audit resources for teachers and actions to commence with students

Before undertaking the waste audit there are a few steps that need to be taken to make the most of the audit and help determine what your school hopes to achieve from this activity. It is important to involve the students during this pre-audit phase to deepen their understanding of the issue and highlight what can be achieved by undertaking the waste audit.

Step 1 - Existing Waste Services and activities:

Understand the existing waste collection system in your school and any other school activities being undertaken that are diverting waste from landfill (for example composting, Return and Earn). Complete the *Outline of existing waste services and activities* sheet to determine the number and type of bins on site, as well as any activities currently being undertaken to reduce waste to landfill. It is helpful to have this information together before completing your first audit to help identify potential future activities for waste reduction. If there are other activities already taking place there may be an opportunity to improve on these systems.

Have students create a map of the school, marking where all bins are currently located. This will build a picture of key areas in the playground, and will be invaluable when auditing the waste from different areas, as the composition of waste from a bin located near a library is likely to be different to a main eating area.

Also identify how the playground bins are emptied into the main collection bins – is there any sorting, or has sorted waste been all thrown back into the one bin?

Step 2 - Defining goals and objectives:

Determine your goals and objectives for completing the waste audit. This is completed with the students as a class or special interest group (for example environment club, waste team). There is a Goals and objectives worksheet in the *Student Resource Booklet*.



Waste reduction goals and objectives

It's one thing to decide that you want to reduce the school's waste creation and disposal - but another thing to actually do it. Writing down your goals and objectives for the audit will assist you and the school to understand how to improve the way you look at waste and how you manage it.

Goal: Where you want to be, what you hope to achieve

Objective: How you will get there? What can you measure to make sure you can reach your target?

Sample goals:

- 25% increase in Return and Earn containers collected by end of year
- Have two 240L compost bins in use by mid next year
- 50% reduction in food waste

Sample objectives:

- Establish Return and Earn drop off locations around the school
- Separate food waste by providing dedicated containers
- Create posters, short videos and presentations on waste separation
- Increase recycling across the school by providing a range of options for collecting recyclables
- Develop a plastic free snack booklet for parents and students
- Educate students and staff on waste reduction, recycling and disposal

Council can attend your school to work through the goals and objectives setup. Allow approximately 45 minutes for the session. This will include a 15 minute introduction to waste and what an audit is, and then time working through the student resource booklet.

Step 3 - how much waste to assess:

Determine the number of days' worth of waste you would like to audit and arrange with the relevant person to ensure this waste is stored for the audit in a hygienic manner. It is recommended that the waste audit be completed the day prior to the school's scheduled collection day.

Following the audit you can use the results to determine projected waste volumes for a week/month or year.

Most schools do 1-2 days' worth of waste, based around their collection schedules.

Step 4 - waste category selection:

Determine the waste categories you want to include in your waste audit (e.g. soft plastics, organics, paper and cardboard) and how you are going to measure the amount of each waste type.

For example, if you are trying to find out the amount of organics (i.e. food, hand paper towels) in your waste, will you:

- Weigh it using scales?
- Measure the volume using additional containers? (make sure you know the volume of these containers)
- Count the individual organic items?

Depending on the waste type and the information you want to know, the measurement method you choose may vary (e.g. bottles and cans for return and earn would be counted). However, it is recommended that as well as individual methods, you also use a consistent form of measurement (such as volume across the entire waste audit) to help you analyse and understand your audit results.

Types of waste to include in your audit:

The most common waste categories targeted in the waste audit include:

Paper and Cardboard: most schools already have a paper/cardboard collection service, but it is worth checking whether paper and cardboard is ending up in bins that are going to landfill.

Organics -compostable (such as fruit, veg, dirty paper): how much food are you throwing away that could have either been eaten or composted?

Organics - non-compostable (such as bread, biscuits, meat): how much food are you throwing away that could have either been eaten or fed to animals (eg chickens)?

Recyclables: items such as bottles and cans can not only be recycled, they could earn you money as part of the Return and Earn scheme.

Soft Plastics: did you know any plastic that can be scrunched into a ball can be recycled into plastic furniture or children's play equipment? Look out for the REDCycle bins at Coles and Woolworths.

Landfill/residues: what is left over that has to go to landfill? (You may be surprised by the amount that falls into this category)

Other: If you have a special waste type at your school you want to identify and measure – just add it in!



Essential resources

- Gloves*
- Safety Glasses (optional)*
- Tongs or grabbers
- Large rubbish bags
- Tarpaulins
- Rake or broom
- Scales/Spring balances/hanging scale – measures in 0.1kg increments between 100g – 20kgs
- Clip boards and pens for recording
- Buckets for waste sorting and weighing
- Bags for sorted waste
- Felt tip marker for labelling bags
- Whiteboard and pens for recording weights

*For each student

Note: All students must have enclosed shoes on the day to participate

Student roles

Sorters: Students will sort through the waste placed on a central tarp and separate the waste types into buckets (one for each different waste type). Label each bucket with the type of waste you are placing in it.

Weighers/Volumer (not a real word): As the waste is sorted students will either weigh each of the waste types or measure the volume of each waste type. If you are weighing, weigh in increments then total the waste type at the end.

Scribes: Students will write down and record the waste types, weights, volumes and make comments on what is being found as the audit is being conducted.

Counters*: Count the number of items in each category where possible e.g. straws, drink containers, sandwiches, whole fruit, etc.

*Note How many 10c containers are you throwing away? If you want to know how many eligible containers under the Return and Earn scheme you are throwing away (i.e. potential money going into the bin) make sure you get your counters to record this.

Data analyst: A student who is good at entering the data for closer examination in the post-audit stage.

Audit recorder: This is a great step your school is taking to reduce its impact on the natural environment. So make sure to record this wonderful collaborative event for future promotion and to use in potential future grant applications (include photos, or even video if you like).

Weather conditions

Sometimes the weather on the planned day is not perfect. Wind, rain, heat and cold can challenge the audit team. The following are a few suggestions for key audit locations:

1. The school hall – if this location is available, the scheduled audit won't be affected by weather conditions. It will also provide plenty of room to accommodate the students (and a bit of noise!).
2. An outdoor area that is sheltered from wind is another great location to conduct the audit, this can be either undercover or open.

When arranging the audit, select several possible locations. As the audit day approaches, keep an eye on the weather forecast to assist with deciding on the final location for the audit to take place.

Undertaking the audit

1. Ensure that students have been allocated to their specific roles as listed above.
2. Lay tarps out on site, label all equipment and hand out required equipment to students.
3. Select your waste and or recycling bins for auditing – make sure the recycling and general waste are audited separately.
4. Carry out a spot check of the volume of rubbish you are about to audit. You may be doing an audit of all your school bins, but are they all full?

Simply decide if they are:

- Full
 - $\frac{3}{4}$ full
 - Half full
 - $\frac{1}{4}$ full
5. Tip all waste out onto a large tarp and begin sorting the waste into the correct areas. Continue until all the waste has been sorted.
 6. Allocate two weighers/volumers, counters and scribes to each tarp for weighing and recording of items (the recording sheet is included in the Audit Pack)
 7. Once all the waste is sorted into different types you can take a closer look at what is in the recyclables, including:
 - 10c containers, bottles, cans and poppers (Return and Earn)
 - Plastics – soft and hard to be sorted into separate piles
 - Paper and cardboard – if it has not been placed in the paper and cardboard area

Auditing Waste and Recycling Bins? – Set up two sorting areas and have one group sort the general waste bins and the other groups sort the recycling bins.

You can swap the groups half way through to ensure students experience sorting both waste streams

8. Data analyst to compile all the records of weights and waste types for further discussion during the post audit process.
9. Complete the projected waste volumes, potential Return and Earn and Snap Shot of the Day worksheet to get a picture of what you have just discovered.

Note: Stained paper lunch bags, tissues or other dirty paper need to go into the compostable organics pile during sorting, not recycling.

part 4 – where to from here?

The results are in!

Once the audit is complete it is important to undertake a post audit review so we can understand what the results mean. Council has developed a number of tools to help you do this and begin to develop your school's future plans to reduce waste going to landfill.

Recommendations

Have a look at the results of the audit and make recommendations about possible ways to reduce your waste to landfill. The template has been divided into the different waste types so you can address each waste type individually.

- Organics
- Recyclable
- Soft Plastics
- Landfill

Add other categories if you wish.

Review waste reduction goals and objectives

Often as we carry out a project we learn new things along the way. As a result you may want to add or change goals and objectives. There is nothing wrong with this - it shows that you are paying attention to what you are doing and are open to taking on new information as it comes to light.

Here we give you an opportunity to review the goals and objectives that were set during the pre-audit process and determine if they need to be adjusted or can remain as they are.

Waste reduction action plan

Action plans are developed to provide a clear picture of how you will specifically achieve your goals and objectives.

This template will help you prioritise and develop actions for each of the waste audit objectives and goals developed.

Here are a few actions to get you started:

- Develop waste education signage around the school to help students and staff sort their waste.
- Zero waste lunch day.
- Nude food day.
- School assembly update sessions to take the entire school on the waste reduction journey.
- Establish compost or worm farming areas. Great for your veggie garden!

- Work with the canteen to reduce single use plastic items. Can alternatives like bamboo or compostable material be used instead? Or could you implement a return system for cutlery items?
- Fix it day: hold 'fix it' events with the aim of reducing the amount of stuff that is thrown out (there may be the opportunity to partner with an organisation that is undertaking similar work).
- Reusable art and craft competition: encourage fun activities like a reusable art and craft competition that sees students repurposing items that would otherwise be thrown in the bin. Display the artwork as a point of pride in the front (administration) offices.
- Utilising school newsletters to get your great waste work out to the wider community (Mums and Dads).
- Holding a school fete? Incorporate a clothes swap stall as a demonstration of reuse and reduction of waste to landfill, assess how food stalls may be able to be waste free or low waste and encourage stalls to have simple waste plans in place to meet the school's new waste reduction focus.

Sharing the story of the waste audit journey

Provide a contact place for schools to share the story of their journey (a hash tag or something similar), which can be shared on your school's website or social media from time to time.

Council to provide a # or place for schools to share their waste audit journey and waste reduction stories, if they wish to do so.

Curriculum links

Waste Audits and the development of a School Waste Reduction Plan provide opportunities for students across a range of subject areas. The following are some of those links:

Stage 2

ST2-1WS-S	ST2-2DP-T	EN2-1A	GE2-3	MA2-2WM	MA2-3WM
MA2-11MG	MA2-18SP				

Stage 3

ST3-1WS-S	ST3-2DPT	EN3-1A	GE3-3	MA3-2WM	MA3-3WM
MA3-7NA	MA311MG	MA3-18SP			

Stage 4

SC4-4WS	SC4-7WS	GE4-3	MA4-2WM	MA-3WM	MA4-5NA
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Stage 5

SC5-4WS	SC5-7WS	GE5-3	MA5.1-2WM	MA5.1-3WM	MA5.3-4NA
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