

Schools & Waste: Audit to Action

A Schools Guide to Conducting Waste Audits and
Developing a Waste Action Plan

November 2021

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Regional Council, Mid-Western Regional
Council and Narromine Shire Council



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Introduction



With large volumes of waste and potential for change, schools are in a great position to significantly minimise waste generated and reduce the amount of materials sent to landfill. As schools are a central part of community, there is also opportunity for positive waste knowledge and behaviour to disperse into the homes across the community which can have a broader positive impact on local waste issues.

Figure 1. displays the NSW EPA waste hierarchy which is a set of priorities for efficient use of resources, indicating most preferred to least preferred ways to deal with waste. This hierarchy and the notion that our materials and natural resources used in their production, transport, and consumption are valuable, are key foundations in developing and improving waste systems across schools, government, business institutions, and households.

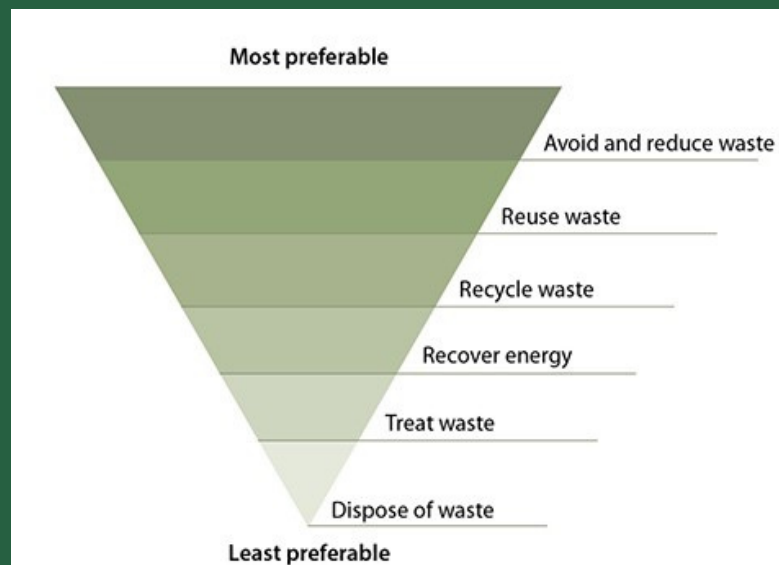


Figure 1. The Waste Hierarchy. NSW EPA.

This guide aims to assist you to undertake activities with this hierarchy in mind.

The waste audit section of the guide will assist educators in preparing for an audit, undertaking the audit, and how to take practical action to reduce the amount of waste you create and send to landfill. A waste audit serves as a great tool to help students sort and classify waste, weigh and record results, report on their findings and to develop a waste avoidance and reduction action plan.

The action plan section of the guide will assist students to develop strategies to reduce waste produced at school and divert it from landfill.

A waste action plan is vital to delivering the benefits of waste reduction and is an important component of a schools broader Sustainability Environmental Management Plan (SEMP) in effective whole school approaches.

Waste Audits

What

A waste audit is a hands on observation, recording, and analysis of regular waste generated in your school. Waste audits help to understand the volumes and types of waste a school generates.

Conducting an audit with students is an important tool for identifying the nature of the waste problem so that solutions through action can be developed and implemented.

Why

Waste audits are a pivotal step in creating effective action plans to reduce waste to landfill, reduce school emissions and support important lifelong positive waste behaviours for students and educators. Reducing waste to landfill is of utmost importance as current rates of landfill are problematic and unsustainable. It is crucial that all actors across the community take responsibility for the waste they produce and make changes in their waste practices, including our schools across the region.



Benefits of waste audits

Save Money

It's expensive to send valuable materials to landfill. Schools can save money on waste and allow spending elsewhere by reducing the number of skip bins of waste that they send to landfill. Imagine a 50-75% reduction!



Knowledge

Waste audits provide valuable memorable hands on experiences for students that span across KLAs:

- numeracy
- literacy
- working scientifically
- geographic inquiry
- personal & social capability



Rescue Resources

There are important environmental and social benefits of preventing valuable finite resources from ending up in landfill. Some benefits to schools include improving resource recovery and reducing school greenhouse gas emissions.



Planning & Conducting an Audit



Waste audits don't need to be daunting or difficult. Waste audits can be on many scales: classroom bin checks, school yard bins, whole school bin checks, and school bulk bin audits. The important thing is to make it achievable and realistic. A clear plan will help make the process fun, engaging and efficient for students and educators.

The below technique will help you plan and conduct your audit, whatever scale you choose.

1. Preparation and Safety.

Make sure you have all items required, explain the objectives and process clearly to students. Utilising a white board or display to visually show the set up and process can be helpful.

Put on gloves and other protective equipment. Talk about safely handling waste before commencing the audit.

It is also important in this step to clearly define each waste category and give examples of what belongs where.

As part of preparation it is also good to investigate what current waste services your school engages.

2. Team up.

Get into your teams and determine jobs: Recorder, Collectors, Sorters, Counters, etc. For smaller groups you may want to complete the audit as one team.

- **Sorters:** Students will sort through waste placed on tarp and separate the waste types into separate labelled containers, one for each waste type.
- **Weighers:** As the waste is sorted students will weigh each bucket in each waste type. Weighers can weight in increments (each bucket) then total the waste type at the end.
- **Scribes:** These 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.
- **Visual recorder:** One or two students can be responsible for taking photos and video of the collaborative process, also noting the most common items found. These photos can be used in report tasks relating to the audit and for future promotion and possible grant applications to demonstrate the positive steps the school is taking to reduce its impact on the natural environment.

3. Collect

Collect your waste samples (classroom bin, schoolyard bin, multiple bins, or bulk bin).

4. Spread out

Spread out the waste ready to sort it (for each team do this on a tarp, newspaper, table, a clear flat surface out in the playground). Consider where you may do this in a somewhat sheltered space to avoid rubbish potentially blowing away.

5. Sort

Sort your waste materials into different categories using appropriate PPE such as tongs and gloves. Categories can include compostable organics, return and earn, other recyclables, reuse, problem wastes (batteries, paints etc.), landfill waste- the categories are endless, choose types and numbers that are realistic and meaningful. To start with keeping it simple with recyclables, organics, drink containers and landfill can be helpful and avoid confusion.

6. Measure & record

Measure and record the location, volumes and types of waste found. Tally the items in each category then find out the total number of units (buckets) and weight of the different waste types. You can use the template attached in Appendix A to record your findings or create your own if you would like to add more waste streams.

Taking photos during this process and of final waste volumes is also a helpful record.

7. Clean Up.

Put away tools and items used and wash hands thoroughly.

8. Discuss & analyse

Come back together as a group and discuss and analyse in detail the overall findings.

What kinds of waste did we find? What volumes of different waste categories did we find?

Are all these items going to landfill?

There are questions on page 2 of Appendix A to help shape this discussion.

9. Act

Take action by creating a SMART (specific, measurable, achievable, relevant and time-bound) action plan to improve the school's waste management systems. This plan will likely be informed by the findings of the audit. Appendix B provides a helpful template for this.



Equipment Needed

- Gloves*
- Aprons* (optional)
- Safety glasses* (optional)
- Tongs or grabbers
- A range of buckets or large containers (colour coded if possible and labelled for different waste types)
- Tarpaulins, drop sheets or Newspaper to sort on
- Rake
- Clip boards and pens for recording
- Waste audit record sheet for each team- (Appendix A or create your own template to add more waste streams.

*For each student.

All students should also be wearing enclosed footwear.



Audit Kits for loan

We have a limited number of audit kits available that schools/classes can book in to borrow from council.

Please contact your relevant councils Resource Recovery Education Officer to see if a kit is available to borrow on wasteeducation@dubbo.nsw.gov.au or

- Dubbo Regional Council (02) 6801 4000
- Mid-Western Regional Council 1300 765 002
- Narromine Shire Council (02) 6889 9999

After an Audit: Review & Planning

It is important to undertake a post audit review to discuss findings after conducting waste audits. These findings should inform the basis of the campaign to put into action.

The audit data will likely support school composting, recycling, return and earn campaigns, or targeting reduction of single use plastics. Page 2 of Appendix A will assist with this review and identifying a focus for action.

While creating an action plan is not a magic formula, it is important in establishing goals and identifying what is required to achieve them. While it should be acknowledged that creating change in waste behaviours and systems is complex, a plan is a fundamental step towards transformative change.

With the support of educators, students can work on a plan and action a campaign for change, by starting with the following 5 steps. Appendix B is a helpful tool in this process.



Why? Making a case for change

What? Developing the opportunity

How? Defining the proposal

Act. Implementing the change

Reflect. Evaluating and reflecting



Tips for Successful Waste Campaigns

Alongside having a solid plan for changes you wish to implement, the below factors have shown to make for an effective campaign:

- Self-elected 'green helpers'- an opportunity for students to develop leadership, creativity, and have fun.
- Regular meetings
- Student ownership- monitoring and education through creating posters & signs, songs, slogans, rewards
- Green helpers should be recognised, celebrated, and rewarded
- Daily duties- short 10 minutes post lunch e.g. maintenance of compost or recycling
- Canteen, cleaning staff, P&C, and SRC to be consulted and kept informed

Ideas for Action

Some ideas for Action to help with inspiration:

- Reducing single use plastics through an awareness campaign
- Establish a compost or worm farm for year group to reduce organics going to landfill
- Introducing a recycling system and service
- School wide return and earn collection scheme, with funds made to contribute to school programs or projects.
- Work with canteens to reduce single use plastics- think eliminating some and exploring alternatives.
- Hold a 'fix it' day to stop items from being thrown out
- Hold a reusable art and craft competition
- Develop waste education signage around the school to help students sort waste
- Zero waste lunch days
- School assembly update sessions

We are excited to see what other fantastic ideas your students come up with.



Syllabus links

NSW Department of Education (2018) has provided suggested syllabus links per activity outlined in the below table. Note: Listed outcomes may apply to more than one set of activities.

Activities	Knowledge & Understanding Outcomes	Skills Outcomes
<p>Define 'waste', 'landfill', 'recycle', 'recyclable'. Discuss why waste is an issue locally, nationally and globally. Identify items that fit the five waste categories as per waste audit process. Investigate the properties of waste materials, origins and life cycles of products. Investigate recycling strategies used by people to conserve resources. Sort and categorise one day's waste from the school.</p>	<p>Science and technology K-6 ST1-10ES-S recognises observable changes occurring in the sky and on the land and identifies Earth's resources ST2-7MW-T investigates the suitability of natural and processed materials for a range of purposes ST3-7MW-T explains how the properties of materials determine their use for a range of purposes Science 7-10 SC4-13ES explains how advances in scientific understanding of processes that occur within and on the Earth, influence the choices people make about resource use and management</p>	<p>Science and technology K-6 ST2-1WS-S questions, plans and conducts scientific investigations, collects and summarises data and communicates using scientific representations ST3-1WS-S plans and conducts scientific investigations to answer testable questions, and collects and summarises data to communicate conclusions Science 7-10 SC4-6WS follows a sequence of instructions to safely undertake a range of investigation types, collaboratively and individually SC5-6WS undertakes first-hand investigations to collect valid and reliable data and information, individually and collaboratively</p>
<p>Measure weights and volumes of waste categories. Record results on spreadsheets and graphically. Analyse school waste bills for landfill and recycling costs. Analyse waste audit results and identify problems.</p>	<p>Mathematics K-10 MA2-11MG measures, records, compares and estimates volumes and capacities using litres, millilitres and cubic centimetres MA2-12MG measures, records, compares and estimates the masses of objects using kilograms and grams MA2-18SP selects appropriate methods to collect data, and constructs, compares, interprets and evaluates data displays, including tables, picture graphs and column graphs MA3-18SP uses appropriate methods to collect data and constructs, interprets and evaluates data displays, including dot plots, line graphs and two-way tables</p>	<p>Mathematics K-10 MA2-1WM uses appropriate terminology to describe, and symbols to represent, mathematical ideas MA3-1WM uses appropriate methods to collect data and constructs, interprets & evaluates data displays, including dot plots, line graphs and two-way tables MA4-1WM communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols MA5.1-1WM uses appropriate terminology, diagrams and symbols in mathematical contexts Science 7-10 SC4-7WS processes and analyses data from a first-hand investigation and secondary sources to identify trends, patterns and relationships, and draw conclusions SC5-7WS processes, analyses and evaluates data from first-hand investigations and secondary sources to develop evidence-based arguments and conclusions</p>



Activities

Conduct a survey of waste attitudes and knowledge.
Undertake problem solving to propose strategies that reduce waste to landfill.

Knowledge & Understanding Outcomes

Geography K-10
GE2-3 examines differing perceptions about the management of places and environments
GE3-4 compares and contrasts influences on the management of places and environments
GE4-4 examines perspectives of people and organisations on a range of geographical issues
GE5-5 assesses management strategies for places and environments for their sustainability

Skills Outcomes

Geography K-10
GE2-4 acquires and communicates geographical information using geographical tools for inquiry
GE3-4 acquires, processes and communicates geographical information using geographical tools for inquiry
GE4-7 acquires and processes geographical information by selecting and using geographical tools for inquiry
GE5-7 acquires and processes geographical information by selecting and using appropriate and relevant geographical tools for inquiry

Plan waste reducing strategies and targets.
Report waste audit results, waste reduction suggestions and targets to the school community and decision makers.
Implement school waste action plan.
Take personal actions to reduce waste.
Monitor and review school waste action plan.

Geography K-10
GE1-2 identifies ways in which people interact with and care for places
GE2-2 describes the ways people, places and environments interact
GE2-3 examines differing perceptions about the management of places and environments
GE3-2 explains interactions and connections between people, places and environments
GE4-3 explains how interactions and connections between people, places and environments result in change
GE5-5 discusses management of places and environments for their sustainability
PDHPE K-10
PD1-7 explores actions that help make home and school healthy, safe and physically active spaces
PD2-7 describes strategies to make home and school healthy, safe and physically active spaces
PD3-7 proposes and implements actions and protective strategies that promote health, safety, wellbeing and physically active spaces

English K-10
EN2-1A communicates in a range of informal and formal contexts by adopting a range of roles in group, classroom, school and community contexts
EN3-1A communicates effectively for a variety of audiences and purposes using increasingly challenging topics, ideas, issues and language forms and features
EN4-3B uses and describes language forms, features and structures of texts appropriate to a range of purposes, audiences and contexts
EN5-3B selects and uses language forms, features and structures of texts appropriate to a range of purposes, audiences and contexts, describing and explaining their effects on meaning



Conclusion

Activities such as waste audits and waste change campaigns aimed at preventing waste from ending up in landfill produce positive environmental, economic and social benefits for students, the school, and the broader community.

This guide provides basic information to help educators plan, develop and conduct waste audits and action plans in the school setting to catalyse that positive change.

Dubbo Regional Council, Mid-Western Regional Council and Narromine Shire Council wish to support schools across our communities in reducing their waste to landfill.

Please contact our Resource Recovery Education Officer via email on wasteeducation@dubbo.nsw.gov.au or call the council contact numbers below to enquire about: borrowing a Waste Audit Kit, to get general information about Council's kerbside waste services or more specific assistance with a waste reduction campaign involving reuse, recycling, composting or return and earn systems. We would also love to hear about your waste audits and action, please get in touch and share waste audit and action photos, stories, and outcomes.

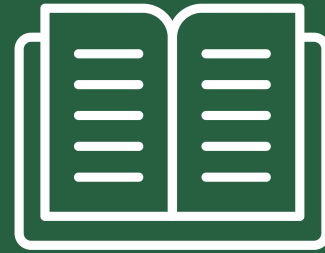
Dubbo Regional Council (02) 6801 4000

Mid-Western Regional Council 1300 765 002

Narromine Shire Council (02) 6889 9999



References



NSW Education Standards Authority (NESA) for and on behalf of the Crown in right of the State of New South Wales 2012, English K-10 Syllabus.

NSW Education Standards Authority (NESA) for and on behalf of the Crown in right of the State of New South Wales 2015, Geography K-10 Syllabus.

NSW Education Standards Authority (NESA) for and on behalf of the Crown in right of the State of New South Wales 2012, Mathematics K-10 Syllabus.

NSW Education Standards Authority (NESA) for and on behalf of the Crown in right of the State of New South Wales 2018, PDHPE K-10 Syllabus.

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NSW Environmental Protection Authority 2017, The Waste Hierarchy, <<https://www.epa.nsw.gov.au/your-environment/recycling-and-reuse/warr-strategy/the-waste-hierarchy>>.

NSW Government 2019, *Learning across the curriculum*, <<https://education.nsw.gov.au/teaching-and-learning/curriculum/learning-across-the-curriculum/sustainability/teaching-and-learning/waste#Syllabus3>>.

Rumbalara Environmental Education Centre n.d. , *School Environmental Management Plan, A Simple Guide to Conducting a School Waste Audit*, <<https://rumbalara-e.schools.nsw.gov.au/content/dam/doi/sws/schools/r/rumbalara-e/localcontent/waste-audit-feb-2013.pdf>>.

Wingecarribee Shire Council 2020, *School Waste Audit Guide*, <<https://www.wsc.nsw.gov.au/files/assets/public/environment/waste-education/school-waste-audit-guide.pdf>>.

Waste Education Resources

- Dubbo Regional Council, Mid-Western Regional Council and Narromine Shire Council are voluntary members of NetWaste Regional Waste Group. NetWaste have some fantastic school resources for teachers including School Programs and School Activity Kits. You can find them here.
- NSW EPA have an excellent impact calculator to help calculate the wider benefits of recycling including emissions reductions, energy and water savings, and landfill space savings.
- Sustainable Schools provides excellent waste and sustainability teaching resources, student activities, whole school sustainability planning information and funding opportunities. Find out more here.
- Eco Schools an environmental education framework and program as part of Keep Australia Beautiful Organisation. Find out more here.
- ABCs War on Waste is an excellent resource for upper Primary and Secondary students and is available to access on ABC iview.
- Love Food Hate Waste is run by the NSW Environment Protection Authority as part of Waste Less Recycle more, a NSW Government Initiative funded from the waste levy. Love Food Hate Waste have some excellent Food Smart Schools resources for both teachers and parents that can be found here.
- VISY has excellent free educational materials to help support learning around recycling. Check out the materials here.
- Return and Earn supported by the NSW Government have practical and helpful resources that assist in teaching students about sustainability and recycling while earning funds for your school. You can find these resources here for download.
- CoolAustralia.org have helpful materials on an array of topics, including sustainability, waste and resource recovery. Find out more here.
- Redhill Environmental Education Centre offer incursions and excursions to facilitate knowledge, understanding, skills, values and positive behaviours relating to cultural and environmental heritage, with a focus on sustainability- including waste. Find out more here.
- Wambangalang Environmental Education Centre supports and empowers environmental learners for a sustainable future through school incursions and excursions with a focus on sustainability- including waste management, composting, worm farms, edible garden programs, ecosystem management and energy sources. Find out more here.





Appendix A: Waste Audit Recording Sheet

Date: _____ School: _____ Audited area: _____

Auditing Team Student Names: _____

Instructions

Each team is to sort and record weight and number of buckets of each category on a recording sheet. When all teams have completed their sheet, everyone comes together to calculate the final totals and discuss findings.

Recycling	Tally (buckets)	Total weight (gms/ kgs)
 <p>Examples: Cardboard, clean paper, food containers, food tins.</p>		
Drink Containers	Tally (drink containers)	Total \$ value (10c each)
 <p>Cans Bottles Cartons Juice boxes or poppers</p>		
Organics	Tally (buckets)	Total weight (gms/ kgs)
 <p>Examples: Fruit & vegetable scraps, chips, biscuits, cakes, rice, pasta, bread, dairy, meat, soiled paper & paper towel.</p>		
General Waste	Tally (buckets)	Total weight (gms/ kgs)
 <p>Examples: Plastic bags, soft plastic packaging, plastic straws, plastic cutlery, polystyrene.</p>		

Total buckets: _____

Total weight: _____

<u>ALL TEAMS TOTALS</u>			
Waste Category	Total Buckets	Total Weight	% of Total Waste
Recycling	_____	_____	_____
Organics	_____	_____	_____
General Waste	_____	_____	_____

Total Drink Containers _____ **Dollar Value** _____

Let's talk about it

1) Are you surprised by the contents of the bin/s? If so, how?

2) What percentage of the waste do you think could be kept out of landfill?

3) What were the most common items found?

4) What could we do better? (For example start a compost bin, recycle our drink containers, paper recycling, reduce our single use plastic...)

5) How can we achieve this? (who, when, where, what now)

Appendix B: Waste Action Plan Brainstorm



Answer the questions to help form a plan to improve waste practices in your school. This can be done individually or in teams and then discussed, or as a whole class. For earlier learning Stages this is best completed by the educator with input from the students

1. Complete a bar graph that shows the percentage of total waste in each waste category.

For example your class may have found that 45% of waste was recycling, 25% of waste was landfill and 30% of waste was organics- represent your findings in a bar graph.

% of waste

Recycling

Organics

General Waste

Waste Types

2. Describe the problem you identified?

There might be more than one, but if for this plan let's focus on one problem to change. Identify what needs to change e.g. the school generates a large volume of organics that are currently going to landfill, this could be the same for recycling, or return and earn drink containers

3. Explain why is this a problem? Why is change needed?

What are some of the negative issues with current practices? Why should something change e.g. wasting valuable finite resources, expensive, missing out on opportunities such as learning about composting or the opportunity to raise funds through return and earn.

4. Describe what action you think should be taken to address this problem.

Some examples: for a composting system be introduced, for a recycling system to be introduced., for containers to be collected to take to return and earn machines.

5. Detail how this will work? What are initial and ongoing tasks required? Who will be involved and responsible for waste tasks? How will this be communicated?

How will the change be achieved

What (tasks) need to be undertaken to make this happen



Who is responsible for each task

For example if your plan is to bring in recycling bins to the school. Who will maintain and manage recycling bins? Who takes recycling bins out? This may be a combination of people, one way to manage and maintain recycling or compost is through a student green team who are elected and complete small tasks on a daily basis.



How would change be communicated

Think about who is involved in decision making and everyday tasks (principal, school cleaning team, students, teachers, parents) and how you might communicate the change for each of these groups. Examples might include meetings, newsletters, digital communications, posters made by students, songs or skits at assembly.

6. How can you reflect and evaluate if the change is a success?

Waste Reduction Action Plan Template

Use this template to plan actions to achieve your objectives and overall goal.

Goal	Objective	Action	Timeframe	Cost	Savings	Priority

