

ZERO WASTE - Data Collection Pack

Overview:

This pack includes instructions and templates to help you gather all the data you need for a Measuring Change Waste Audit.

There are different ways to approach a waste audit. The Measuring Change audit process is designed to give robust data in a range of situations – from a large secondary school to a small early childhood centre, and everything in between.

The waste audit has two sections:

1. **Costs:** Finding out what it costs your school or centre to manage its waste *each year*.
2. **Waste volumes:** Collecting and weighing the waste (including recycling and composting) streams of materials *from one day*.

After carrying out both sections of the audit, you will end up with a completed **Waste Audit Summary Sheet** – this is the information that you then enter into the Measuring Change website.

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Section 1: Cost of Waste Management

Overview:

Knowing how much it is costing to dispose of waste is an important part of understanding the waste picture and can help motivate people to make changes!

This part of the audit is based on finding out how much your school or centre has spent to dispose of waste for the last **12 months**.

The data you want to collect may include:

- | | |
|------------------------------|---|
| Landfill: | The costs of collection and disposal of rubbish that goes to landfill. Typically it will be a regular skip bin collection. |
| Green waste: | This is garden waste, like lawn clippings. You may pay for these to be collected from your school or centre, or at times someone make take them to a transfer station where there is a charge for disposal. |
| Recycling: | You may pay to have some or all recyclables collected, or there may be a cost involved in taking them to a recycling station. |
| Hazardous /electronic | You may pay a fee to dispose of this waste responsibly. This category includes collection of sanitary waste. |

You will need to ask your office/ finance staff to help with tracking down this information.

How you gather the data will depend on the systems that your school or centre has in place.

Data Collection Sheet 1: Cost of Waste Management

This sheet will help you record and compile information on the annual cost of waste management at your school or early childhood centre.

NOTE: Do not include one-off set-up costs, for example the purchase of rubbish or sanitary bins.

Measurement Period Capture the previous year's data up to the date of your waste audit	Landfill waste disposal	Green waste disposal	Recycling collection			Hazardous /electronic waste disposal
			Paper	Cardboard	Plastic, glass, metal	
Month	Total cost \$	Total cost \$	Total cost \$	Total cost \$	Total cost \$	Total cost \$
SUBTOTAL			\$/yr	\$/yr	\$/yr	
TOTAL	\$/yr	\$/yr	\$/yr			\$/yr

Transfer these TOTALS to the WASTE AUDIT SUMMARY SHEET

Section 2: Waste Audit

Overview and preparation:

The Measuring Change waste audit is based on sampling the waste stream from **one day**. For the purposes of this audit the waste stream is made up of three main components: **A** the waste from rubbish bins, **B**, the materials that had already been set aside for recycling, and **C**, the materials that had been set aside for composting.

A = Landfill

- All waste from your audit day that was going to be disposed of to landfill.
- Will include contents of all rubbish bins and anything that your cleaners, caretaker or other people have put aside to go in the skip bin.
- Green waste (e.g. lawn clippings) is NOT included in this audit.



A1 = “Divertible” Material that had not been separated out prior to the audit BUT can be recycled or composted.

A2 = “Non Divertible” Waste that cannot be recycled in your area and is non-organic so cannot be composted.

B = Recycling

- All materials your school or centre had already separated for recycling.
- May include clean paper, cardboard, plastics with the codes that can be recycled in your area, recyclable metals and glass bottles and jars.



C = Composting

- These are the food scraps and compostable paper that had been collected to go into your compost bin, worm farm or bokashi system.



Things to do in preparation:

- Undertake the pre-audit activities from the Teacher Support Activities resource, or if you are an EnviroSchool, you can also explore the many activities in the Zero Waste Theme Area (on a CD with your EnviroSchools Kit).
- Decide when are you going to do your audit (see tips on the next page).
- Decide who needs to be involved and make sure they are prepared (see tips on the next page).
- Select an audit site and prepare your equipment for the day (see tips on the next page).
- Think through health & safety issues and complete whatever forms the school or centre uses (e.g. a RAMS form).
- If you are going to take photos, organise permission slips.

Tips - deciding when are you going to do your audit:

- Choose a day that has normal operations, i.e. not a sports day, community event, gala day etc. If you repeat the audit process each year, it is a good idea to stick to the same month as the previous year's audit to avoid seasonal differences.
- Check weather forecast – it is much easier to do a waste audit on a fine day that is not too windy!
- Lets say you have decided to audit all of Tuesday's waste...
 - To ensure that you are only auditing Tuesday's waste, make sure that all the containers you will collect waste from have been emptied on the Monday night or first thing Tuesday morning.
 - At the end of the day on Tuesday the waste team will collect all the material to be audited.
 - You could then carry out your waste audit after hours on the Tuesday, or store the waste overnight and audit on Wednesday.

Tips - deciding who needs to be involved and preparing them:

- You will need enough people to cover all the different jobs:
 - Sorters – go through the waste and sort it into categories.
 - Weigher – weigh the samples and record the weights.
 - Checker – stand by the weigh station to check the correct waste is in each box, and the data is being recorded correctly.
 - Waste disposers – take the weighed materials and set them aside for later processing (will either go to landfill, or be diverted into recycling or composting).
 - Photographer – to record the event!
- Make sure the audit team knows to wear old clothes and covered shoes for the audit.
- Let key people in your school or centre know the audit is going to happen, especially caretakers and cleaners. Check if they have questions or concerns. Let them know what you would like them to do to help with the audit.



Tips – selecting a site and preparing your equipment

- In selecting a site for the audit it is good to find a place that is:
 - Out of the wind
 - Out of direct sunlight (ideally or make sure people have hats and sunscreen)
 - Ventilated – if inside/covered
 - Away from food preparation or eating areas
 - Away from storm water drains
 - Close to waste disposal point
 - Close to hand washing facilities
 - Close to water for site clean-up
- Check that you have all the equipment on the Waste Audit Equipment checklist (page 13)
- Print out the forms in this pack as well as the Waste Audit Summary. Familiarise yourself with them.

Audit Instructions:

Set-up:

1. Collect waste to landfill, recycling and compost material from everywhere in the school or centre at the end of the day to be audited. Make sure you keep the different types of material separate! It can help to put landfill waste into big rubbish bags. Recycling and compost material can generally stay in the containers they are already in.
2. If you are doing the audit the next day, make sure your waste is stored in an appropriate place. If you are auditing at the end of the day, then take the waste to your audit area.
3. Place your tarpaulin down and secure it with bricks or large stones.
4. Double check your equipment list and organise equipment in a tidy way.
5. Set out the bins for sorted materials and attach category labels (pages 14 to 16 of this pack). Line the food bin.
6. Have an area where you can store waste that has been sorted and weighed that keeps it separate from waste that is yet to be audited.
7. Check how many students are present on the day of the audit.



Part A – Landfill Audit:

You will need the three sheets that make up **Data Collection Sheets 2A - Landfill Audit** (pages 8 to 10). Sort as many bags as you are able to during the time you have available. If you don't have time to sort all bags, when you come to compile your data you will use the overall weight of all the bags to extrapolate your results.

Do not include the gloves, bags etc. in your waste data, as equipment used is not considered to be part of the waste stream from the day.

The audit includes sorting Hazardous Waste that might be in rubbish bins (such as batteries) but not Hazardous Waste that has already been separated out to take for appropriate disposal.

1. Place your *Weighing Container* on the scales and zero the scales. If your scales do not have this feature, you will need to note the weight of the container and then adjust each measurement accordingly. If all your sorting bins are identical (as pictured above) you do not need to transfer waste to a Weighing Container, just make sure you zero the scales using an empty Sorting Container.
2. Weigh all of the bags of waste. Fill in the totals on **1: Tally of Landfill Bag Weights**. Transfer the total to cell A of **3. Landfill Audit Results**.
3. From the Sorters team, determine sorters for each category of waste.
4. Empty bags (maybe two at a time depending on size) onto the tarpaulin and start sorting into the Sorting Containers. It can help to sort into buckets and then empty these into the Sorting Containers.

5. As each Sorting Container fills up, the sorters take it to the weighing area and transfer the contents into the Weighing Container.
6. The Weigher, helped by the Checker, weighs the waste and records the results on **2. Landfill Audit Sorting**.
7. The Waste Disposers then take the weighed waste to the post audit storage area and put it in the appropriate container (landfill, compost or recycling).
8. Repeat the steps 3 – 7 until you have removed all the recyclable and compostable materials from the waste on the tarpaulin. The remaining waste can be placed into the 'Other – All other waste' category box, and weighed.
9. Transfer the totals from **2. Landfill Audit Sorting** to **3. Landfill Audit Results**.

Optional Step: Non-recyclable Food Packaging activity from the Teacher Support Activities

This activity will give you information that could be helpful when it comes to reflecting on your waste stream and designing actions to take. It involves looking through the waste sorted as "All other waste" to separate out all food packaging (e.g. chip packets, juice cartons etc.) and all pieces of plastic wrap. Then counting and tallying these as per the instructions in the activity - refer pages 4 & 5 of the Zero Waste Teacher Support Activities.

Part B – Recycling Audit:

1. Determine how much sorting is needed. Some of your recyclables may already be sorted into the four categories we are using for this audit – Paper, Plastics, Metals, and Glass.
2. If sorting is needed, empty recyclables onto the tarpaulin and transfer to the appropriate Sorting Container.
3. If you find non-recyclable items place these in the 'All Other Waste' container.
4. Place your *Weighing Container* on the scales and zero the scales. If your scales do not have this feature, you will need to note the weight of the container and then adjust each measurement accordingly.
5. The sorters take material from each category to the weighing area and transfer the contents into the Weighing Container.
6. The Weigher, helped by the Checker, weighs the waste and record the results on **Sheet 2B: Recycling Audit**.
7. The Waste Disposers then take the weighed material to the post audit storage area and put in the appropriate container (landfill, compost recycling).
8. Repeat steps 4-7 until you have weighed and recorded all the material separated out for recycling.

Part C –Composting Audit:

1. Collect food scraps and compostable paper set aside for worm or compost bins.
2. Place your *Weighing Container* on the scales and zero the scales. If your scales do not have this feature, you will need to note the weight of the container and then adjust each measurement accordingly. Or, if weighing in the original container, e.g. food scraps bucket, you will need to weigh the empty container at the end and adjust the weight recorded
9. The Weigher, helped by the Checker records the total weight of all bins on **Sheet 2C: Composting Audit**.

**Data Collection Sheets 2A – Landfill Audit
1: Tally of Landfill Bag Weights**

Bag #	Weight (kg)	Bag #	Weight (kg)	Bag #	Weight (kg)
1		21		41	
2		22		42	
3		23		43	
4		24		44	
5		25		45	
6		26		46	
7		27		47	
8		28		48	
9		29		49	
10		30		50	
11		31		51	
12		32		52	
13		33		53	
14		34		54	
15		35		55	
16		36		56	
17		37		57	
18		38		58	
19		39		59	
20		40		60	
Sub total		Sub total		Sub total	
Grand Total of Waste to Landfill					kg

Data Collection Sheets 2A – Landfill Audit

2. Landfill Audit Sorting

Primary Category	Secondary Category	Weight	Weight	Weight	Weight	Weight	Total kg
A1: Materials That Could Have Been Diverted From Landfill							
Paper	Recyclable paper – office paper, shredded paper, newspapers, magazines, printed materials.						
	Cardboard – cardboard boxes etc.						
	Compostable paper – paper towels, serviettes, non-waxy food bags and wrappers, moulded paper e.g. egg cartons.						
Plastics	Recyclable plastics – Check with your local Council what symbols can be recycled in your area.						
Organics	All food scraps						
Metals	Steel cans/ aluminium cans/ clean aluminium foil						
Glass	All glass bottles and jars						
A2: Materials That Cannot Be Diverted From Landfill							
All other waste							
Hazardous waste *							
TOTAL A2							

* Note about Hazardous Waste: this waste should not be landfilled but disposed of in an appropriate manner at your transfer station or through an e-waste facility. However, for the audit we are including hazardous waste found during your landfill audit it in the “non-divertible” category to simplify the data entry and reporting. Generally the volume of hazardous waste found mixed in with general waste should be quite low.

Data Collection Sheets 2A – Landfill Audit

3. Landfill Audit Results

Transfer the data from sheets 1 and 2 onto this sheet

A: Total Waste To Landfill		A =	kg
Enter the total weight of all bags of waste, even if you didn't sort them all.			
A1: Materials That Could Be Diverted From Landfill		Total weights from audit	
Paper	Recyclable paper – Office paper, shredded paper, newspapers, magazines, printed materials.		kg
	Cardboard – Cardboard boxes.		kg
	Compostable paper – Paper towels, serviettes, non-waxy food bags and wrappers, moulded paper e.g. egg cartons.		kg
Plastics	Recyclable plastics – Check with your local Council what symbols can be recycled in your area.		kg
Organics	All food scraps		kg
Metals	Steel cans / aluminium cans/ clean aluminium foil		kg
Glass	All glass bottles and jars		kg
TOTAL (add up all of the sub-totals above)		A1 =	kg
A2: Materials That Cannot Be Diverted From Landfill		Total weights from audit	
Waste	All other waste (plus hazardous waste)	TOTAL	A2 = kg

If you audited your entire sample, then:

- Check that $A1 + A2 = A$ (It should add up!)
- Transfer totals **A**, **A1** and **A2** to the **Waste Audit Summary Sheet**.

OR

If you did not have time to audit all the waste in your sample, use the following calculation to extrapolate your results.

Step 1: Divide **A** (the total weight of all bags) by **(A1+A2)** (the total weight of waste audited). This will give you a multiplier to apply to the amounts that you did audit.

Value A divided by (A1 + A2) = Multiplier	
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Step 2: Multiply **A1** and **A2** (kg) by this multiplier to get an estimated result for the whole sample.

Value A1 times multiplier = Adjusted A1	
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Value A2 times multiplier = Adjusted A2	
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Step 3:

- Check that $\text{Adjusted A1} + \text{Adjusted A2} = A$ (It should add up!)
- Transfer total **A**, and **adjusted totals for A1** and **A2** to the **Waste Audit Summary Sheet**.

Data Collection Sheet 2B: Recycling Audit

Depending on the volume of recycling you have, you can use the table at the bottom to tally up totals.

B: RECYCLABLE MATERIALS		Total weights
Paper	All clean paper - includes shredded paper, newspapers, magazines etc.	kg
Cardboard	E.g. cardboard boxes.	kg
Plastics	Recyclable plastics	kg
	Write the plastic codes you are able to recycle. If unsure, check with your local Council what can be recycled in your area.	Codes
Metals	Such as steel cans/ aluminium cans/ clean aluminium foil	kg
Glass	All bottles and jars.	kg
OTHER MATERIALS – found during your recycling audit		
All other waste - materials that cannot be recycled		kg
Transfer the TOTALS above to the Recycling section (B) of the Waste Audit Summary Sheet		

Tally – use if needed									
Category	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	Total kg
Paper									
Cardboard									
Plastics									
Metals									
Glass									

Data Collection Sheet 2C: Composting Audit

Depending on the volume of compostables, you can use the table at the bottom to tally up totals.

C. COMPOSTABLE MATERIALS		Total weights
Composting	All food scraps and compostable paper, e.g. paper towels, serviettes, non-waxy food bags and wrappers, pizza boxes	kg
OTHER MATERIALS – <i>found during your composting audit</i>		
All other waste - materials that cannot be composted		kg
Transfer the TOTALS above to the Composting section (C) of the Waste Audit Summary Sheet		

Tally – use if needed						
Primary Category	Weight	Weight	Weight	Weight	Weight	Total kg
Composting						

Checklist: Waste Audit Equipment

Equipment	Comments	#	Check
<i>Tarpaulin plus weights</i>	This is put down in audit area to minimise mess from waste sorting. It can help to have some rocks or similar to weigh down the corners.	1	
<i>Electronic Scales (metric)</i>	If the scales need to be plugged in make sure you have a cord that can reach from your audit area.	1	
<i>Sorting Containers</i>	These are containers for sorting waste into different categories. Could be boxes or bins.	9	
<i>Buckets (optional)</i>	You may also want to use buckets that people can have right beside them to sort waste into before transferring it to the Sorting Container.	9	
<i>Bulldog clips, tape or bluetack</i>	To attach labels to containers		
<i>Labels for Sorting Containers</i>	You can use the ones provided on pages 14 to 16 of this pack OR make your own	9	
<i>Weighing Container</i>	This is a box or bin that sits comfortably on your scales that can be used to weigh the materials. Use this same box or bin on the scales throughout the audit. Two identical containers can speed up the process. OR if all your Sorting Containers are identical they can also double as the Weighing Containers.	1 - 2	
<i>Post-Sorting Containers</i>	After materials have been sorted and weighed you will have three groups of materials that need to be stored away from the audit area (so they don't get mixed up): <ul style="list-style-type: none"> • Non-divertible waste that goes to landfill (rubbish bags work well). • Divertible materials that can be recycled (box or bin). If you want to keep the recycling types separate you will need up to 4 containers – for paper/card, plastic, glass, and metal. • Compostable materials (bucket or similar) • Hazardous Waste found during the audit 		
<i>Clipboards</i>	Can be helpful for your data collection sheets. Useful to have a clipboard for each part of the audit (landfill, recycling and composting) as well as one that has the Waste Audit Summary Sheet on it.	4	
<i>Pens or Pencils</i>	Can help to attach these to the clipboards.	4	
<i>Protective gear</i>	<ul style="list-style-type: none"> • Gloves (for everyone handling waste) – can use disposable ones or even better re-useable ones such as gardening gloves that can be washed. • Covered shoes, protective old clothing • Hats & sunscreen if not working under cover 		
<i>Calculator</i>		1	
<i>Cleaning gear</i>	A dustpan and brush is really useful for sweeping little bits of waste off your tarpaulin. You might also use a broom and rags or cloths. Detergent and scrubbing brush to wash out containers.		
<i>First aid kit</i>	Ideally have this with you, or at least make sure you know that you have one nearby.		

Support material: Waste Sorting Labels

Cut out these labels and attach to sorting boxes.

Recyclable paper

Office paper, newspapers, magazines, printed materials

Cardboard

Compostable Paper

Paper towels, serviettes, non waxy food bags and wrappers

Recyclable Plastics

Organics / Food Scraps

Metals

**Steel & aluminium cans,
clean aluminium foil**

**Glass bottles
& jars**

All other waste

Hazardous waste
– batteries, electronic
equipment etc.