

# A Simple Guide to Conducting a **SCHOOL WASTE AUDIT**

The waste audit looks at the different types of waste generated in the school, where it comes from and how it can be reduced.

*This unit is designed for stages 2 to 6.*



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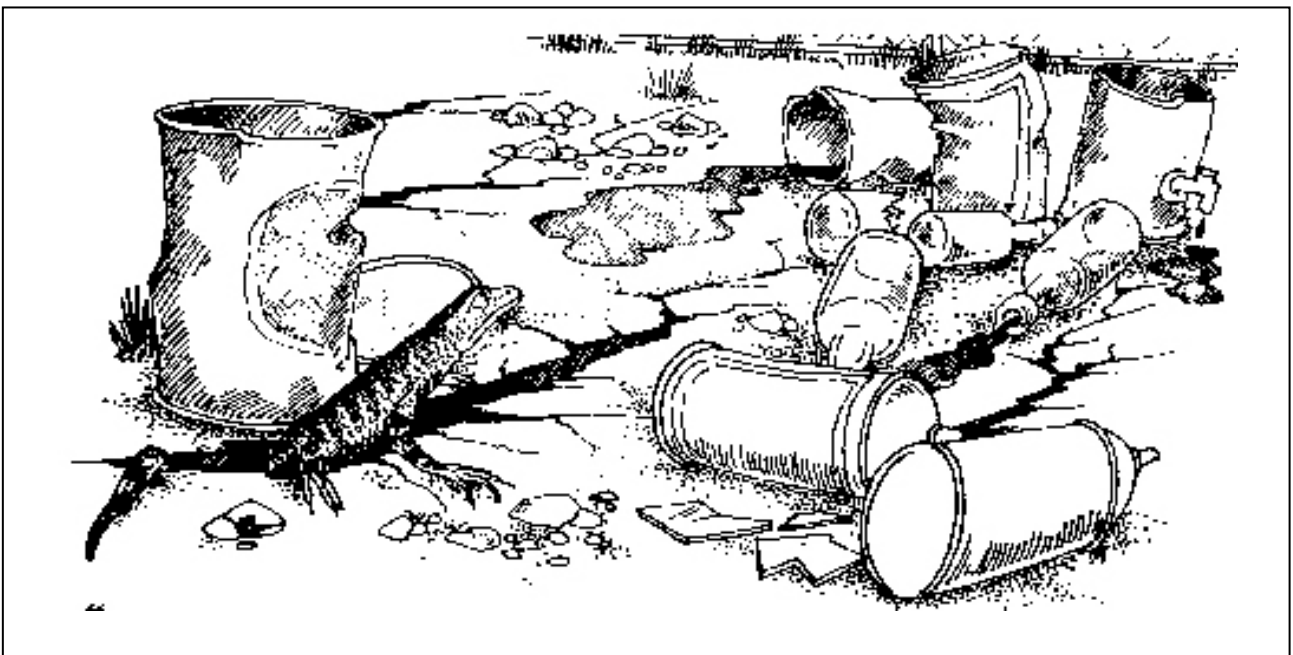
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## Why Do a Waste Audit

- Reducing waste is a simple way of making our resources last longer.
- New landfill sites are hard to find and transporting waste is costly.
- The hands-on auditing experience is a memorable and most effective way of raising awareness of waste issues. It links across KLA's with students developing skills in numeracy (measuring, charting, costing), literacy (discussing, presenting, reporting), science (problem solving, materials, recycling), health, history and geography. (See Appendix 5).



- Schools can save money by reducing the number of skip bins of waste that they send to landfill.
- DET is also required to report to the EPA on its Waste Reduction and Purchasing Plan (WraPP). This plan targets paper, toner cartridges, construction and demolition waste as well as garden and food waste.



## Planning To Reduce Waste

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1. Conduct a Waste Audit to measure how much and what types of waste are generated by your school.
2. Analyse the waste audit results and discuss ways of reducing waste.
3. Prepare a brief report on waste at your school and include your suggestions.
4. Present the report to the School Environment Committee, the SRC or to the School Executive and ask them to set waste reduction targets.
5. Implement targets.
6. Evaluate the implementation (conduct another audit).

## Preparing for a Waste Audit

### Secondary school method

*An alternative procedure that relies on students sorting the rubbish as they dispose of it (less messy and probably only suited to primary schools where students have lunch in their rooms) is described further on.*

1. Seek parental permission for students to participate in a waste audit.
2. Make prior arrangements with cleaners to collect the day's rubbish in labelled garbage bags. Don't choose to do the audit on a Monday because waste would have to be kept over the weekend. Choose a typical day not one when a year group is away on excursion.
3. Provide Marker Pens and labels. Make sure waste from different areas (playground, classrooms, offices, canteen etc) is kept in separate bags. In a large school consider sampling. i.e. only take waste from half the classrooms and half the playground.
4. Store the bags near where you will be sorting and weighing the next day. This location should be comfortable, sheltered and fairly close to the skip bin pickup site.
5. Arrange for a number of class groups to participate. eg one class at a time for about 30 to 40 minutes.

**You will need:** scales, kitchen tongs, gloves, labelled sorting buckets, ground sheets, (all available from Rumbalara EEC), data collection sheets (*Appendix 1*) and clip boards.





## Conducting a Waste Audit

1. **Prepare the sorting area:** a groundsheet (about 3m x 3m) surrounded by sorting buckets. (bigger schools may use 2 or 3 sheets to accommodate more sorting teams).
2. **Prepare the weighing and recording area:** a desk for the scales and chairs for recorders.



### 3. When the class arrives:

- I. Explain the purpose of the waste audit.
- II. Demonstrate the process (empty a bag of rubbish onto the groundsheet and sort individual items of rubbish (using gloved hands/tongs) into the buckets. Ensure students understand each of the categories:
  - **Office white paper** = office paper, black & white photocopies, pale colours/pastels.
  - **Recyclable Paper/Cardboard** = newspapers, magazines, paper bags, milk cartons.
  - **Food and garden waste** = lawn clippings, fruit and veg, tea bags, bread.
  - **Recyclable Containers** = Plastic containers, P.E.T. bottles, metal cans such as aluminium or steel cans /bottles (not window glass).
  - **Mixed waste (non recyclable)** = small bits of paper, dust, chips packets, plastic lunch wrap/clingwrap, poppas,, styrofoam cups etc.
- III. Explain health and safety precautions.
- IV. Allocate equipment and jobs: recorders (2), weighers (2), carriers (4) and sorters (remainder).
- V. Weighers provide a net weight (contents only) and a compressed volume estimate. Waste should be measured by both weight and volume. (Volumes are more difficult to estimate but are important because they relate to the number of skip bins that the school pays for)
- VI. Carriers bring the bags to be sorted and ensure that waste from different collection areas doesn't get mixed. Carriers also take the sorting buckets to be weighed. They tell the recorders where the waste came from e.g. playground. Carriers also take waste to the skip bin after weighing and return promptly to the sorting area.
- VII. Recorders sit near the weigher and makes sure all results get recorded.



## Alternative Waste Audit Procedure (suitable for primary schools)

### Day 1

1. Sample just 1 or 2 classes from each grade.
2. Provide each of the sample classrooms, the staffroom, office and canteen with 5 labelled buckets (as per previous method) into which they dispose of their waste for the whole day.
3. Provide separately labelled bins in the playgrounds for *Mixed Waste, Food Waste and Recyclable Containers*. Put usual play ground garbage bins away for the day **Consider students eating in classrooms on this day.**
4. Keep collected rubbish in classrooms or store in a safe place. Advise cleaners not to dispose rubbish.

### Day 2

5. Record volume and weight of each type of waste the following day. (NB Weigh the combined waste for each classroom).
6. Use samples to estimate quantities for the whole school.
7. Analyse as per previous method.

## WASTE WISE EXCURSION

Rumbalara EEC runs a full day waste wise excursion to support the waste audit.

Activities include:

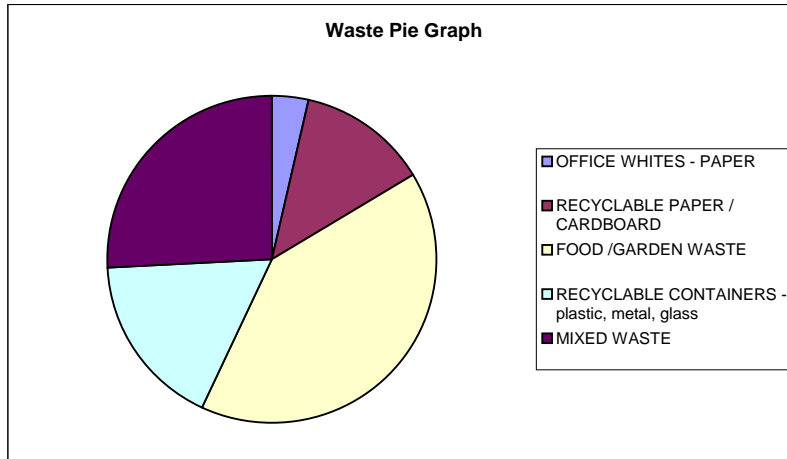
- Visit to a landfill site (Woy Woy or Buttonderry) and a recycling centre to view how our waste is disposed
- Visit to Kariong Eco Garden to discover sustainable ways of recycling organics and growing vegetables.
- Visit to a Public School for a demonstration of an efficient school recycling system.



## Completing the Audit



1. Record all the data onto waste summary sheet. See *Appendix 2*.



2. Chart the results from the summary into a spreadsheet and create a chart eg as pie graphs

3. Analyse results eg compare:

- Weight / volume of each category
- Weight / Volume for each area of the school

4. Calculate how much waste is generated per year and how much waste is generated per person per year? (see appendix 3). Students can also calculate amount of waste generated per week, per month and per term.
5. Find out how much your school spends on waste disposal per year by looking at your school's waste disposal bills. Analyse the cost benefits of recycling all waste. (See Appendix 3).
6. Conduct a survey to find out about attitudes to waste. Interview students, teachers, cleaners, parents and the principal. (See Appendix 4)
7. Discuss ways of reducing waste eg provide labelled recycling bins, set up a compost or get a worm farm, encourage low waste lunches, recycling or repairing computers etc. (see appendix 3)
8. Consider other advantages eg fewer Indian Mynahs, helping the community reduce waste to landfill, conserving resources etc
9. Write a Waste Action Plan to reduce waste in your school. (See *Appendix 4*). For current information on recycling opportunities see 'Ways To Reduce Waste' on the Rumbalara website (see *Appendix 6 Resources*).
10. Consider encouraging waste free lunches at your school (see Appendix 7)

## Appendix 1: Waste Audit Recording Sheet

Location (source of waste) \_\_\_\_\_ Date \_\_\_\_\_

What size are the buckets? (volume in litres) \_\_\_\_\_

<b>Waste Type</b>	<b>Tally Net Weights (kg)</b>	<b>Total weight (kg)</b>	<b>Tally Volumes (litres)</b>	<b>Total Volume (litres)</b>
<b>Office White Paper</b>				
<b>Recyclable paper &amp; cardboard</b>				
<b>Food waste</b>				
<b>Recyclable containers plastic/metal/glass</b>				
<b>Mixed waste (non-recyclable)</b>				



## Appendix 2:Waste Summary Recording Sheet

### Waste Categories by Weight (gms) for different areas of the school

Waste Categories	PLAY- GROUND	STAFF ROOMS	CLASS ROOMS				TOTAL
OFFICE WHITES-PAPER							
RECYCLABLE PAPER /CARDBOARD							
FOOD /GARDEN WASTE							
RECYCLABLE CONTAINERS -plastic,metal, glass							
MIXED WASTE (non-recyclable)							

### Waste Categories by Volume (litres) for different areas of the school

Waste Categories	PLAY- GROUND	STAFF ROOMS	CLASS ROOMS				TOTAL
OFFICE WHITES-PAPER							
RECYCLABLE PAPER /CARDBOARD							
FOOD /GARDEN WASTE							
RECYCLABLE CONTAINERS -plastic,metal, glass							
MIXED WASTE (non- recyclable)							

### Appendix 3: Our Schools' Waste Collection Information

Our schools waste contractor is \_\_\_\_\_

Our school recycles these items \_\_\_\_\_

Our school generates \_\_\_\_\_L of rubbish per day. That's \_\_\_\_\_L per student.

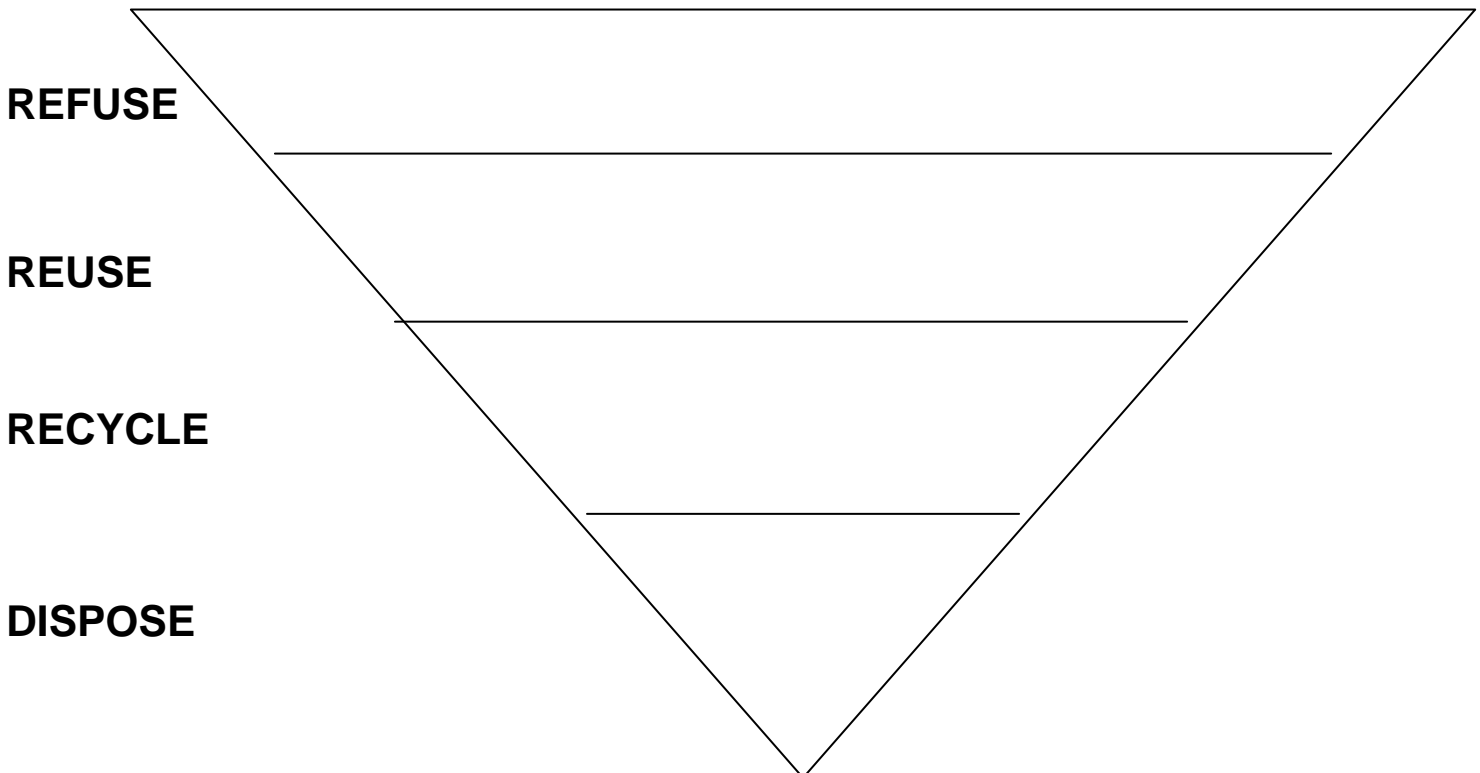
\_\_\_\_\_ % of waste that can be recycled

\_\_\_\_\_ % of our waste that can't be recycled



### Our Schools' Waste Reduction Plan

Fill in the spaces on the Waste Hierarchy Triangle with your waste reducing ideas.



## 2. Cost Of Waste

Waste Type	Size of Bin	Cost per pick up	Cost Per Year
Skip Bins Cost of Recycling Bins			
Total	n/a		



### 3. Waste Cost Comparison: If we recycle everything could we save money for the school?

- Cost of recycling bins is different in Wyong & Gosford. The cost of having a 240L recycling bin (household size) collected fortnightly by council is \$70 per bin per annum (Wyong) and \$81 per bin per annum (Gosford). [Figures correct as at March, 2013]

So, the average is \$75.50 per annum → \$2.90 per 240L bin per fortnightly pick up

- Size of recycling bin is 240L (calculate from your volume results how many bins you would need for your recyclables each week)
- It is free to recycle organics in a worm farm or compost.

Waste Type	Total Volume (litres per day)	Total Volume (litres per week)	No. of bins required?	Cost Per Pick Up	No. of picks up required each year.	Total Per Year \$
Recyclable Containers						
Mixed Waste (Skip Bins)						
<b>TOTAL</b>						

Our present cost of waste is (see Cost Of Waste Table) \_\_\_\_\_

If we recycle everything our cost of waste would be \_\_\_\_\_

Amount saved is \_\_\_\_\_

## Appendix 4: Interview Recording Sheet: Principal

1.	Are you happy with the school's current waste disposal procedures? Are they effective, costly, any problems?	
2.	Is the school's recycling system as good as the residential recycling system that students use at home?	
3	Are students being educated about waste eg 'Refuse-Reduce-Recycle'	
4.	Does the school have any policies or procedures for reducing waste eg low waste lunches?	
5.	Can you suggest ways of further reducing waste at school.	

## Appendix 4: Interview Recording Sheet: Teacher

1.	How do students best learn to reduce waste?	
2.	Is there a system to recycle office white paper in the classroom?	
3	Is organic waste being recycled at school?	
4.	Are printers set to print on double sided mode?	
5.	Is there a problem with litter?	
6.	Are there enough bins in the school and are they in appropriate locations?	
7.	Can you suggest a better method for recycling waste at school?	
8	Are there any good reasons for not recycling at school?	



## Appendix 4: Interview Recording Sheet: Technology Advisor

1.	How does the school dispose of old computers?	
2.	When purchasing new computers, is preference given to those who take back old computers?	
3.	Is there a system in the school for recycling used ink cartridges?	
4.	Is there a system for recycling office white paper?	
5.	Are printers set to print on double sided mode?	
6.	Can you suggest a better method for recycling e-waste at school?	

## Appendix 4: Interview Recording Sheet: Administration Staff

1.	Are there any purchasing policies regarding low waste products e.g buying rechargeable batteries?	
2.	Is there a system for recycling used ink cartridges?	
3.	Is there a system for recycling office white paper.	
4.	Are printers set to print on double sided mode?	
5.	Is there a system for recycling cardboard?	
6.	Can you suggest a better method for recycling waste at school?	
7	Does the school purchase recycled paper? If not why not?	

## Appendix 4: Interview Recording Sheet: Cleaner

1.	Where in the school are the litter problem areas?	
2.	What items present the greatest litter problem?	
3.	Is there a problem with pests eg Indian mynah birds, rats or other wildlife?	
4.	Are there enough bins in the school and are they in appropriate locations?	
5.	Is there a system for recycling cardboard boxes?	
6.	Can you suggest a better method for recycling waste at school?	



## Appendix 4: Interview Recording Sheet: General Assistant

1.	How do you dispose of garden waste?	
2.	Is there a problem with waste thrown on the ground?	
3.	Are there enough bins in the school and are they in appropriate locations?	
4.	Are there opportunities for more recycling at the school? If so what and how?	
5.	How do you dispose of toxic waste? e.g old paint tins and chemicals.	
6.	What happens with old school furniture?	

## Appendix 4: Interview Recording Sheet: Students

1.	Is there a problem with waste thrown on the ground (litter)?	
2.	Are there enough bins in the school and are they in appropriate locations?	
3.	Do you (or would you) assist with any recycling systems in the school? (e.g emptying recycling bins)	
4.	What types of recycling do you do at home?	
5	What types of things are being recycled at school	
	Can you suggest a better method for recycling waste at school?	



## Appendix 4: Interview Recording Sheet: Canteen

1.	Is there a system for recycling cardboard boxes?	
2.	How do you dispose of food waste?	
3.	Is there a system for recycling cans and P.E.T?	
4.	How is food wrapped, plastic or paper?	
5	Are there any purchasing policies regarding low waste products e.g no pre packaged food.	

## Appendix 4: Interview Summary Sheet

Use the information collected from your surveys to fill in the information below.

Waste Type	Recycled? Y/N	Comments (If yes explain the method, if no suggest a method))
Recyclable Paper & Cardboard		
Food & Garden Waste		
Recyclable Containers Plastic/metal		
Batteries (includes mobile phone collection boxes)		
E-Waste (Computers, T.V's etc)		
Ink & Toner Cartridges		
Toxic Waste (Old paint tins & chemicals)		

Are there enough garbage bins around the school and are they in the right places?

Who would help implement recycling systems?

Other suggestions.

# Appendix 5: Example Waste Action Plan

A Powerpoint template is available from Rumbalara EEC

## WASTE MANAGEMENT PLAN

**Put your school Name and logo here**



**Don't forget to put in photos of people who did the audit .... and the date**

## WASTE FACTS

**The Problems:**

- Landfill sites are toxic, filling fast and new sites are difficult to find.
- Energy and resources are wasted when we don't recycle
- Only  $\frac{1}{3}$  of our waste needs to go to landfill



### Typical Waste Stream Composition



Category	Percentage
Food waste	39.9%
Garden organics	14.4%
Other non-recyclables	25.6%
Recyclables (includes paper, glass, steel, liquid paperboard, PET, HDPE, PVC, aluminium)	20.1%

## WHAT CAN BE RECYCLED?

- Newspaper & Cardboard
- Office White Paper
- Steel & Aluminium Cans
- Glass Bottles & Jars
- Plastic containers





## WHAT CAN'T BE RECYCLED?

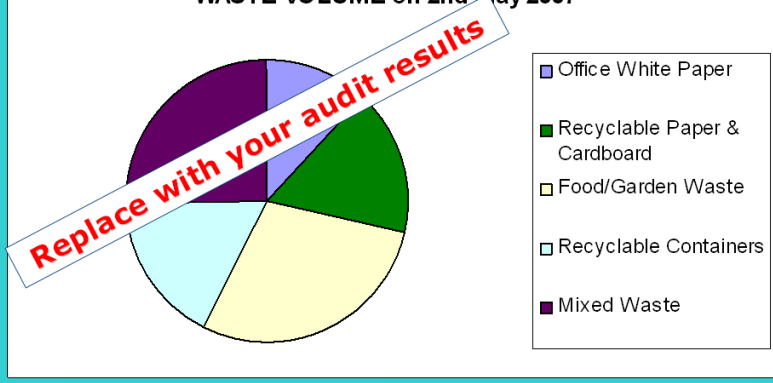
- Broken glass, ceramics
- Containers made of different types of material eg 'Poppers'
- Plastic bags and wrap
- Chemicals, batteries





# WASTE AUDIT RESULTS

Brisbane Water Secondary College Woy Woy Campus  
WASTE VOLUME on 2nd May 2007



## What we Discovered about Waste at our School

- Total waste volume for one day = 1220 litres  
that's = \_\_\_\_\_ litres / student / day
- \_\_\_\_\_ % of total waste that can be recycled
- Our school currently recycles these items:

**List materials currently being recycled**

## THE COST OF WASTE

Mixed Waste (skip bins) Cost / year = \$ \_\_\_\_\_

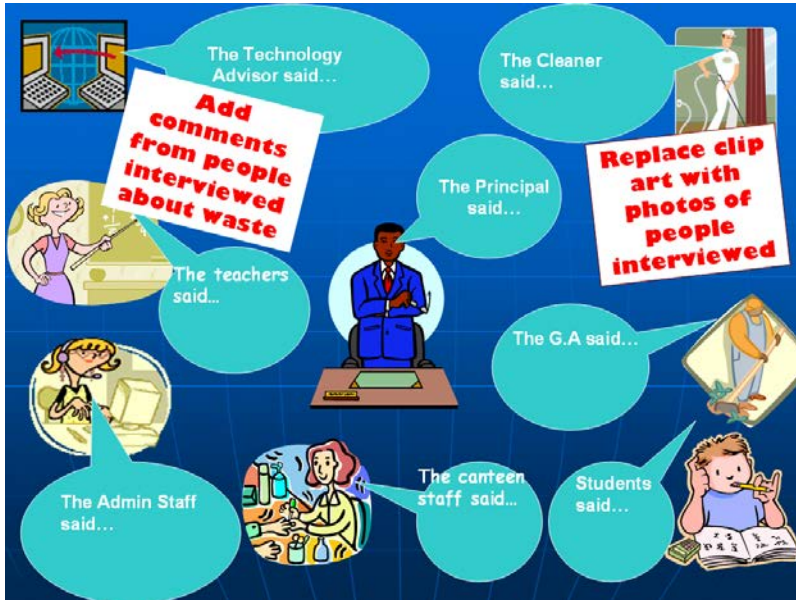
Recyclables Cost / year:

- Metal , glass, plastic = \$ \_\_\_\_\_
- Paper and Cardboard = free
- Green / organic waste = free (compost, worms, chooks)
- Toxic waste = free (biannual pickup)
- Mobile phones, toner cartridges = free
- e-waste (computers, TV's etc ) = free on contract items

Our school could save \$ \_\_\_\_\_  
if we:

**Estimate savings based on volumes that could be diverted from skip bins**





## Our Waste Reduction Ideas

-  ■ Each year group to have a worm farm for food waste
-  ■ Compost all garden waste
-  ■ Recycle office whites
- Develop a waste friendly purchasing policy for the canteen and office.
- Start a waste mobile phone collection service

*Replace these with your solutions*

## Our Waste Targets

- 25% reduction in mixed waste
- 100% recycling of office whites





## Appendix 6: Curriculum links to the Waste Audit

ACTIVITIES	CURRICULUM LINKS
Define waste and Landfill. Discuss why waste is a problem (locally, nationally)	
Identify items that fit the 4 waste categories as per waste audit process.	
Discuss the properties of waste materials, origins and life cycles of product.	
Analyse lunch box contents of a class. Discuss waste free lunch ideas. List alternatives to packaged items.	
Sort one days waste from the school	
Measure weights and volumes of waste categories.	
Record results as on spreadsheets and graphically.	
Analyse school waste bills for landfill and recycling.	
Analyse results and identify problems	
Conduct a survey of 'waste' attitudes and knowledge	
Problem solving to reduce waste to landfill	
Report to the school community and decision makers	
Implement waste action plan	
Monitoring and Review of School Waste Plan	

## Appendix 7 - Resources

### KITS BOOKS & VIDEOS

- Gosford City Council - Waste Management Kit (2005) Available for loan from Rumbalara. Each school in Gosford LGA received a kit in 2005 as part of the Environment Awards Program.
- NSW Office of Environment & Heritage - "Down to Earth" publication (information on composting and worm farming) <http://www.environment.nsw.gov.au/earthworks/index.htm>
- The Lorax (Collins, 1972) by Dr Seuss
- The Sknuks (Rigby 1977) by Colin Thiele,
- Waste Matters (Gould League) Armstrong P & Laffin J 1993
- Earthworms big book (Macmillan, 1989) by K, Pigdon and M.Woolley
- A Worm's Eye View....The History Of The World, Caren Trafford (Etram, 2001)
- How George Saved The World By Lunchtime (Ashton Scholastic, 2007)

### CONTACTS

- Gosford City Council - Environmental Education officer Ph: 4325 8175
- Wyong Shire Council - Environmental Education officer
- Remondis Waste Solutions - Recycling contractor for Gosford and Wyong Councils. Phone: 4336 3121 [www.1coast.com.au](http://www.1coast.com.au) [www.remondis.com.au](http://www.remondis.com.au)
- Earthcare Recyclers, Somersby - large commercial recycling plant, ph: 4340 2188
- SITA Environmental Solutions - skip bins, collection services: phone 4324 6133

### WEBSITES

RUMBALARA ENVIRO. ED. CENTRE Case studies of waste wise schools, waste issues, waste reduction.	<a href="http://www.rumbalara-e.schools.nsw.edu.au">www.rumbalara-e.schools.nsw.edu.au</a>
SCRAP - School Communities Recycling All Paper	<a href="http://www.scrapltd.com.au">www.scrapltd.com.au</a>
VISY Recycling	<a href="http://www.visyrecycling.com.au">www.visyrecycling.com.au</a>
PLANET ARK	<a href="http://www.planetark.com">www.planetark.com</a>
CLEAN UP AUSTRALIA	<a href="http://www.cleanup.com.au">www.cleanup.com.au</a>
KEEP AUSTRALIA BEAUTIFUL	<a href="http://www.kabnsw.org.au">www.kabnsw.org.au</a>
OLLIES WORLD Ollie saves the planet, games, movies, interactive.	<a href="http://www.olliesworld.com">www.olliesworld.com</a>

## Appendix 8 - Waste Free Lunches

Use the audit as basis for introducing waste free lunches at your school. Most waste audits show that a large proportion of mixed waste is from packaged items in student lunches.

### Low waste food might be:

- sandwiches in greaseproof paper - (biodegradable)
- or in a plastic reusable container
- drinks in a reusable container
  - fresh fruit - peelings are biodegradable
  - snacks in paper bags and paper wrapping (biodegradable)
- or a plastic reusable container
- packed in a lunch box

### Items that are not waste friendly:










- Sandwiches wrapped in plastic
- popper drinks in throw away cartons with straws
- cans - they can't be resealed
- lollies in wrappers
- pre-packed foods e.g. chips or biscuits and cheese combination packet.
- Plastic cutlery for yoghurts etc.



### Ideas for Introducing Waste Free Lunches

- Begin by analysing the lunch contents of students in your classroom. Discuss the 'Waste Free Lunch' concept. Ask students to draw a waste free lunch of their choice.
- Totally abolishing packaged food may seem difficult at first so start by encouraging a waste free lunch once a week e.g. 'No Waste Wednesday'
- If students don't take bags with them to lunch provide a place for them to keep their containers till the end of lunch e.g. each class has a basket in the playground.
- Encourage students to take left over or unopened food home rather than throw in the bin.

## Appendix 9 - Plastic Grade Definitions

Plastic Identification Code	Name of plastic	Example of plastic products	Characteristics	Example of recycled plastic products
	Polyethylene Terephthalate (PET/PETE)	Soft drink bottles, sleeping bag filling	Clear, rigid, often used as a fibre	Soft drink bottles, clear film for packaging
	High Density Polyethylene (HDPE)	Milk bottles, crinkly shopping bags	Hard to semi-flexible, usually opaque	Wheelie bins, detergent bottles, agricultural pipes
	Unplasticised Polyvinyl Chloride (UPVC)	Cordial & juice bottles	Hard to rigid, can be clear	Pipes, tiles
	Plasticised Polyvinyl Chloride (PPVC)	Shoe soles, garden hose	Flexible, clear and semi-elastic	Hose cores, industrial flooring
	Low Density Polyethylene (LDPE)	Ice cream lids, garbage bags	Soft and flexible, waxy surface	Freezer bags, plastic packaging
	Polypropylene (PP)	Ice cream containers, crisp packets	Flexible but strong	Compost bins, worm farms
	Polystyrene (PS)	Yoghurt pots, plastic cutlery	Rigid and brittle, clear or glassy-looking	Clothes pegs, coat hangers
	Expanded Polystyrene (EPS)	Hot drink cups, take-away containers	Lightweight and foam-like	
	All other plastics	Includes acrylic and nylon	Varies	Imitation timber and concrete products