



Waste

“ A combination of world population increase and high consumption of products in the developed world has created a global waste problem. The rate of waste generation is now estimated to be greater than the capacity of the environment to absorb this waste.

The benefits of minimising waste include:

- reducing demand for landfill space
- saving resources and energy
- reducing pollution

A change in attitude and behaviour by industry, government and individuals can bring about massive waste reduction.. ”

(Waste Minimisation.

Information Sheet 14. Auckland Regional Council)

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**Teacher
information**

Waste and Environmental Education

Through the exploration and development of the Waste theme, and underlying issues within the Auckland region, it is hoped that students will develop:

- **awareness and sensitivity** to the problem of Auckland's waste and related issues
- **knowledge and understanding** of the efficient use of resources to enable a sustainable lifestyle
- **attitudes and values** that reflect feelings of concern for our waste issues and their effect on the environment
- **skills** involved in identifying, investigating and problem solving associated with the issues related to waste
- a sense of responsibility through **participation and action** as individuals (and as members of a group) in addressing the issues of waste.

(Ref. Guidelines for Environmental Education in New Zealand Schools. p 9).

Key concepts:

The waste issue

- Waste management and the three R's of waste
 - Reduce
 - Reuse
 - Recycle
- Waste management
 - Drop off recycling centres
 - Kerbside collection and recycling
 - Transfer stations
- Landfills
- Use of natural resources
- Waste minimisation
- Waste decomposition
- Methods of waste management/disposal
 - reusing
 - recycling
 - vermicomposting
 - composting
- Personal and community commitment to undertake action

Links to other City Issues



Curriculum Area: Science

Making Sense of the Material World

Students will:

- Investigate and describe ways of grouping a wide range of unfamiliar materials using readily observable properties (level 3)
- research the use & purpose of technology in the disposal, or recycling of some common materials (level 3)
- investigate and group common materials in terms of properties (level 4)
- investigate the positive and negative effects of substances on people and the environment (level 4)

Making Sense of Planet Earth and Beyond

Students will:

- Justify their personal involvement in a school or class initiated local environmental project (level 3)
- Investigate a local environmental issue, and explain the reason for community involvement (level 4)

Focusing and Planning

Students will develop skills and attitudes as they:

Use their science ideas and personal observation and those of others to make testable predictions or to identify possible solutions for trialling

Information Gathering

Record observations and measurements

Processing and Interpreting

Identify trends and relationships in recorded observations and measurements by making links with organised data.

Reporting

Present what they did and report what they found out in their investigation in ways and forms appropriate to their peer group

Essential Skills (Highlight as appropriate)	Curriculum Links
Numeracy Self-management Physical Work and Study	English Maths Social Studies Technology
Social / Co-operative Problem Solving Information	

Possible Learning Outcomes

Students will:

- Describe the differences between reduce, reuse and recycle
- Identify ways people manage and take responsibility for waste
- Explain the difference between renewable and non-renewable waste
- Develop solutions to the issues and problems identified in waste disposal
- Use criteria to evaluate a range of solutions
- Use visual language to present a brochure giving a positive environmental message

Assessment

Teachers may derive specific learning outcomes that are appropriate to the learning needs of their students. These learning outcomes will provide the criteria against which student's achievement can be assessed. Some suggestions for assessment can be found in the Teacher Resource.

Background information

The waste issue

Up until forty years ago, waste was not a significant problem – resources were used efficiently and very little waste was created.

Since then, advances in the manufacturing of goods, a consumer orientated society and a growing world population has resulted in a huge demand on earth's resources and the production of an enormous amount of waste, which has to be disposed of.

The average person in New Zealand produces approximately **2.5 kg of rubbish per day**. Every month in the Auckland region we generate enough rubbish to **fill a rugby field to more than the height of a 10-storey building**.

Landfilling is the primary method of disposal for solid waste in New Zealand. Landfills in New Zealand are filling up quickly and the process of siting a new landfill is long and difficult.

In order to sustain our quality of life, we must conserve our resources through waste reduction, reuse and recycling.

Waste reduction

- Reduction is the most important part of the 3 R's of solid waste management: **reduce, reuse, recycle**. The primary goal of reduction is to avoid making waste altogether.
- Waste minimisation aims at eliminating waste before it is produced and reducing its quantity and toxicity.
- Reducing the quantities of waste we produce lessens some of the resources used and lessens money spent on waste collection and disposal.
- Methods to reduce waste include changing packaging, substituting disposable items for reusable ones and developing products that are more durable or at least repairable.
- For further information and tips for waste reduction refer to 'Information Sheet 1- Waste Reduction' - produced by Auckland Regional Council and available with this resource.

Reuse

- The concept of reuse is to use something again and again.
- Reusing waste conserves resources and reduces pollution.
- Doing something as simple as reusing plastic and glass containers could reduce the amount of waste we produce.
- We can reuse things ourselves or pass them onto friends, relatives, neighbours or community groups.
- For further information and tips for 'reusing' refer to 'Information Sheet 2 - Reuse' - produced by Auckland Regional Council and available with this resource.

Recycling

- Recycling is one of the 3 R's of solid waste management.
- Recycling assists in reducing pollution and reduces the impact on waste disposal and fast-filling landfill sites.
- Recycling reduces the demand made on our natural resources and lowers the amount of energy/power needed in the production process.
- Recycling is the process of recovering materials used in industry or in the home for further uses.
- Strictly speaking, recycling occurs when a product goes back to the original production process, or is reused in another product.
- Kerbside collection programmes and convenient drop-off facilities make recycling easy for the majority of the Auckland region. These programmes accept plastic bottles (1 and 2), glass bottles, aluminium and steel can and paper. Recycling services for clothing, used motor oil and telephone books are also available.
- For further information and tips for recycling refer to 'Information Sheet 3 - Recycling' - produced by Auckland Regional Council and available with this resource.

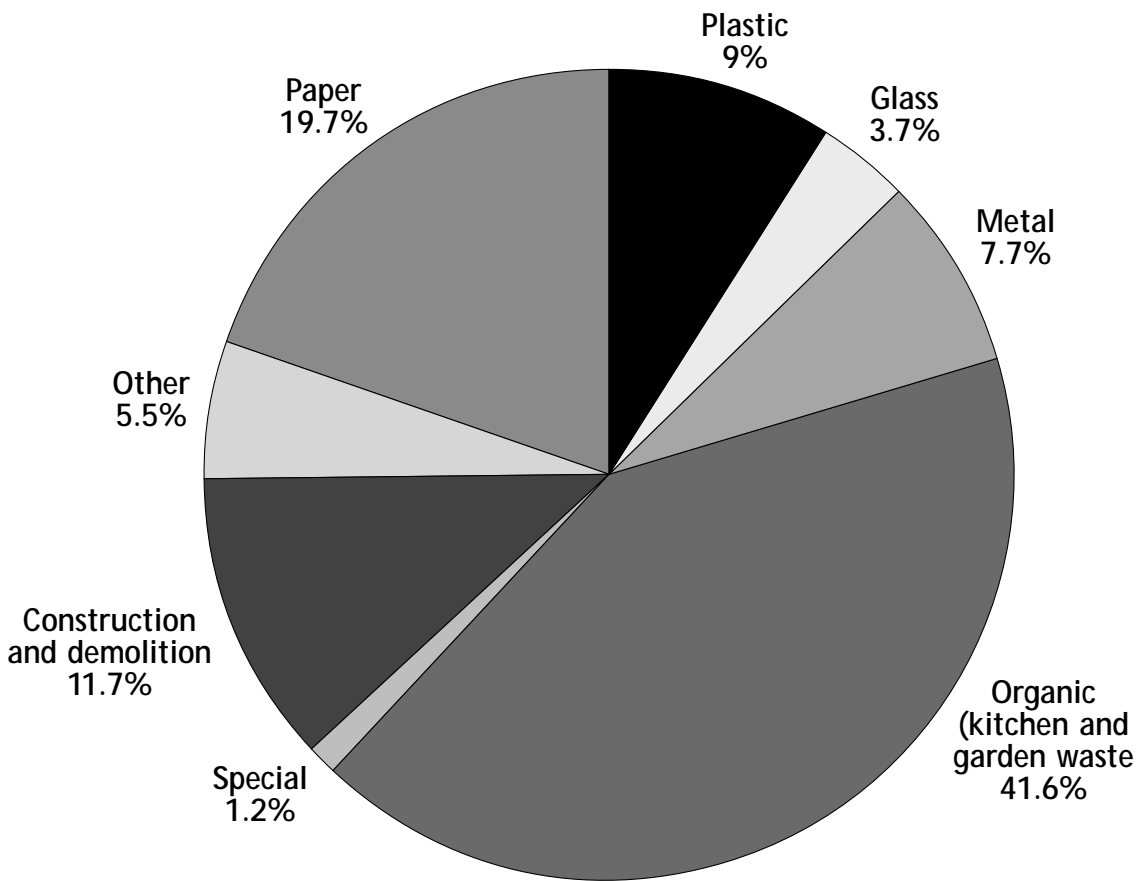
Landfills

- Landfilling is the primary method of disposal for solid waste in New Zealand.
- Landfills have existed since the early 1930's.
- Early landfills were only open pit dumps covered with dirt regularly to hide rubbish and cut down on pests and smells.
- Modern landfills are lined on the bottom with dense clay, limestone or soil. They have been sited in old quarries, mines, canyons and even former wetlands.
- Every day rubbish is taken to landfills and dumped. Once in the landfill, rubbish is compacted into cells and covered with a layer of clay. Topsoil is then added as a final covering so plants can grow and prevent erosion.
- As some waste slowly decomposes it creates methane and sulphurous gases. These gases can pose a serious fire or explosive danger. They also contribute to global warming. The environmental impact of these gases is carefully managed by way of underground extraction systems. Gases are pumped out and either burned off safely or used to generate power.

WASTE

- Another result of the breakdown process is a liquid substance called leachate. This is formed when water (either from rain or underground waterways) combines with decomposing rubbish. Leachate is drained off into nearby water treatment systems.
- Landfill sites are difficult to secure. Public opposition to landfills (**Not In My Back Yard- NIMBY**) and constraints on suitable land contribute to this difficulty.
- The Resource Management Act (1991) set up strict regulations on the evaluation of landfill monitoring and aftercare, making landfilling an expensive and non-sustainable option for managing our waste.

**Residential Composition
Auckland Regional Landfills 1997**



Related topics

This particular resource focuses primarily on the need to reduce the amount of waste being produced and encourages students to find ways of effectively reusing and recycling waste. There are a number of related and important topics that could be explored, for example:

- our use of renewable and non-renewable resources and their depletion
- a comparison of waste produced through the ages eg. 1900 vs. 2000.
- waste produced in other countries (c.f. New Zealand)
- an in-depth look at landfills: their management, the 'breakdown' process, environmental issues linked to poor landfill management
- products made from recycled plastic, glass, metal and paper
- packaging and waste
- the impact of littering on the environment
- hazardous wastes

Many of these topics are explored in:

- **'A Word on Waste'**
A teacher's resource kit on Waste Reduction and Recycling. This kit, designed and developed for primary and intermediate teachers in the Auckland region by Auckland Regional Council, is currently available in all schools.
- **'An Overview of Solid Waste. What a Waste'**
A Technology and Science Curriculum manual for secondary schools, included in the resource kit **'Treading Lightly on the Earth'**. This resource is also suitable for Year 7 and 8 and is also available from Auckland Regional Council.

Both resources provide comprehensive background information on waste and related topics and issues.

Other activities could include:

- Students carry out surveys, make observations, design questionnaires, and/or conduct interviews to investigate waste production in range of community situations e.g. Find out how waste is produced and what can be done to reduce it.
- Reuse waste by organising 'Swap shops' and/or school wide garage/boot sales to encourage the reuse of personal and household items.
- Create new treasures from junk material e.g. musical instruments (use glass, paper, plastic wood), puppets (from paper bags or foam cups, ice cream sticks, paper, felt pens, glue), plant pots (from milk cartons, plastic take-away containers, large plastic bottles).
- Create technology challenges using specified waste materials.
- Make recycled paper.
- Investigate nature's recycling and the mini beasts who are hard at work helping to recycle nutrients.
- Organise some '**Do Without**' days. Do without anything made of plastic for a whole day. Try the same with glass, aluminium and paper!
- Carry out an extensive waste audit within the school. This could provide valuable information and direction for social action.

Suggestions for monitoring and assessment

Interactive approach

- observing
- working with small groups
- listening to discussions

(There are a number of activities within the waste issue that may provide opportunities for assessment of group/individual planning and co-operation.

Conferencing individuals - groups

- "Tell me about your....."
- "Explain your....."

Checklists

Use specific skills and objectives from given lists as criteria in checklists.

Peer support

Students give constructive/positive feedback to peers.

Self evaluation

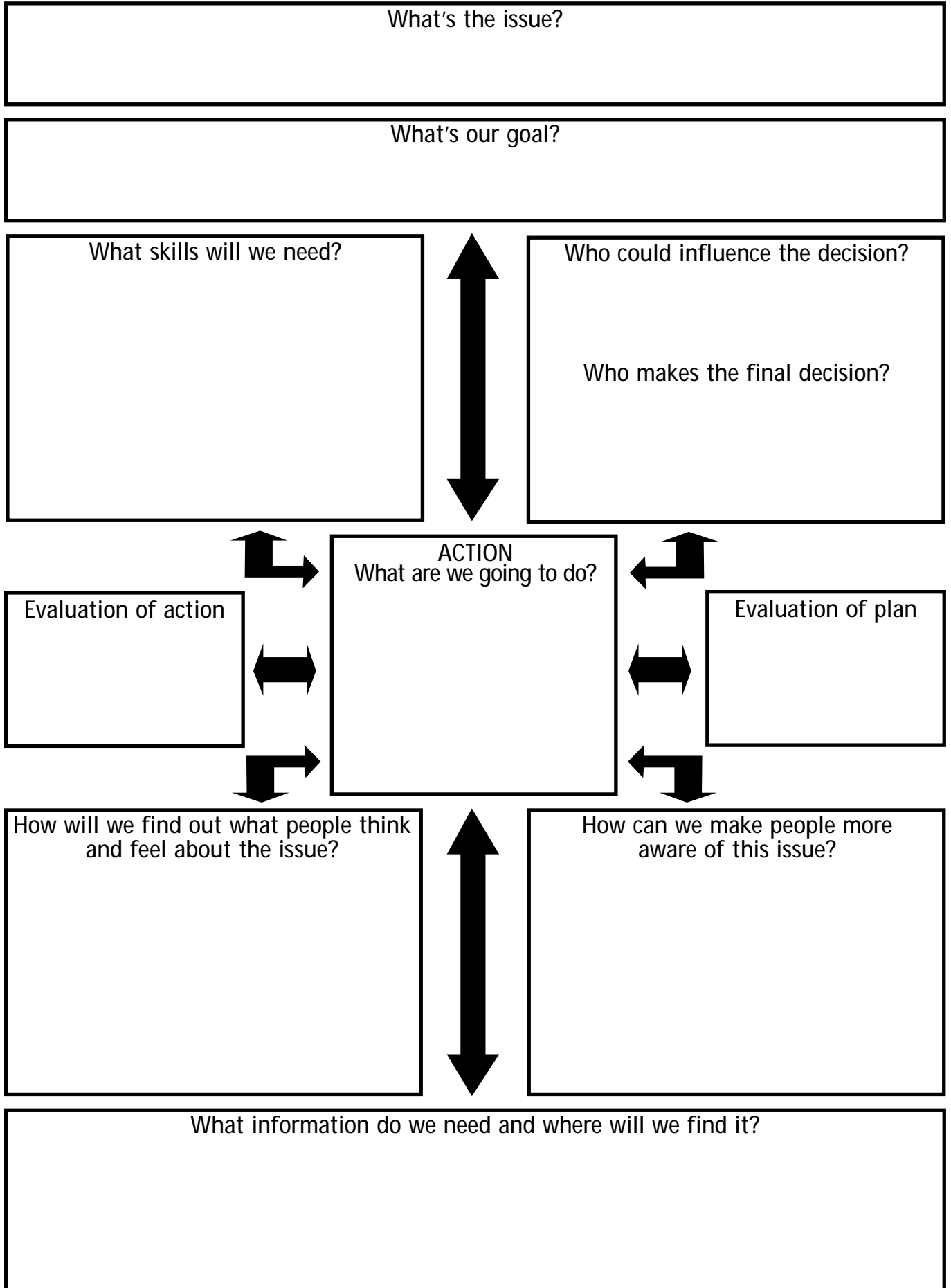
Students complete an evaluation sheet that can include the following:

- In this study I enjoyed learning about.....
- The most interesting fact I learned was.....
- Four new words and their meaning I have learned are.....
- The most interesting sentence I read/learned about the topic was.....
- One thing I would like to find out more about is.....
- One thing I would like to find out more about is.....
- This picture/illustration shows.....

Completed activities from this resource:

- 'Key into some Waste Words' - page 28.
- 'One Person Speaks at a Time Please' - page 58.
- Complete a brochure that increases peoples awareness of the need to reduce the amount of waste we are producing and which gives examples of how this can be achieved. (See 'Rocking, Rolling, Riding into the three R's of Waste').

Environmental Action Planner



Resources

Included in City Issues - Waste pack

No.	Type	Resource
1	Worksheet 24	How to make a worm bin
2	Env. Info 1	Waste Reduction
3	Env. Info 2	Reuse
4	Env. Info 3	Recycling
5	Env. Info 4	Plastic Recycling
6	Env. Info 5	Paper Recycling
7	Env. Info 8	Aluminium Recycling
8	Env. Info 13	Want to help the environment
9	Flyer	Trash Map
10	Flyer	Reduce, Reuse, Recycle
11	Booklet	Keep your rubbish toxic free
12	Brochure	Your home guide to composting
13	Brochure	The story of the SNARCS
14	Postcard	Sort it Out
15	Postcard	Composting a growing trend
16	Flyer	Litterless Lunch Day
17	Poster	Naturally Compost

Further copies of ARC resources are available from:

Enviroline 09 366 2070

(for callers outside the toll free area please phone 0800 80 60 40)

Website www.arc.govt.nz

Other resources

A Word on Waste. A teacher's resource kit on waste reduction and recycling. Aimed at primary and intermediate schools. Auckland Regional Council.

Treading Lightly on the Earth. A Technology and Science unit for secondary schools - part of the kit "Treading Lightly on the Earth". It is also suitable for year 7 and 8 students. Auckland Regional Council.

School journals

Battle of the monster trucks by John Medcalf 1997 1:2

Monster trucks are awesome machines! It's a real clash of the titans when "Big Foot" lines up against "Kiwi Thunder" in a massive car-crushing competition.

Beyond recovery by Frances Parkin 1979 3:1

A visit to three projects in Auckland in which groups of people are trying to deal with rubbish, seeing what can be saved from it, and what can be used again in some way.

The day of the enormous bin by Mary Powell 1987 3:2

The boys find lots of goodies in the enormous rubbish bins, including a large piece of plywood they decide to commandeer for a fort. But after removing everything else to get at the board, they have the problem of getting all the rubbish back in the bin. And then there is the problem of trying to carry the board.

The dustman - poem by Clive Sansom 1981 1:4

Filling the bin by Marion Rego 1987 1:3

A family who are doing up their house hire a big bin for all the rubbish. They are amazed to find how the rubbish changes from day to day - one person's rubbish is another's treasure.

Is that a soft drink bottle you're wearing? By Pat Quinn. 1999 4:1

There's an old fairy story about a strange little man called Rumpelstiltskin, who could spin gold from straw. But it's just a fairy story. Everyone knows that you can't make something valuable out of rubbish-or can you?

Keep it clean! 1991 4:2

The Journal editor talks to the supervisor of one of the Christchurch transfer stations to find out how they manage to have no litter or rubbish around, no smell, and no rats, mice or flies.

Lions in the streets by Eva Wong Ng 1989 1:1

In China, rubbish bins in the shape of lions and other animals wait for people to feed their open mouths with litter.

A load of junk by John Lockyer 1998 1:4

Mum and Dad take a big load of junk to the dump. As fast as Dad unloads the junk from the trailer, Mum loads on treasures that other people have discarded. They leave with just as much rubbish as they had when they arrived.

A load of rubbish by David Hill 1996 1:1

A play about the night time raiders who reduce Mr Butler's tidy bag to a scruffy mess that blows all over the streets (Ten characters)

Maria and the fish and chip paper by Rachel McAlpine 1983 1:3

When Maria can't be bothered putting the fish and chip paper in the rubbish tin, she throws it over the fence. But she finds the lady next door has enough rubbish of her own.

Mr Trask's trash by Angie Belcher 1998 4:2

When Mr Trask visited Te Puke Intermediate School and said he wanted to talk rubbish, the students were surprised. It wasn't until he delivered his reuse, reduce, and recycle message that everyone understood exactly what he meant.

The place of the gulls by Brian Birchall 1991 1:1

Young Gull follows the others to a wonderful place - the rubbish tip - where gulls are brought food by the truckload.

The power of rubbish by Pat Quinn 1993 3:2

In New Zealand, methane gas is being recovered from some of our larger rubbish landfills and used to generate electricity.

Quilling by Raewyn Collins 1998 4:2

Quilling is a fun way to recycle paper. Use your quilling skills to make pictures and cards.

A special sort of person by Patricia Murphy 1989 2:2

'Any fool can drive a rubbish truck,' say Trev and Stu who do the bags. But Mr Coker who does the driving maintains there's an art in it. When Mr Coker has to take a day off, the others realise he is right.

Success story by Ruth Priestly 1979 3:2

In Wellington harbour an old scow called "Success" collects rubbish from all the ships in port. Then it heads off to Evans Bay wharf where the rubbish is incinerated. This is to guard against unwanted pests or diseases entering the country. The same thing happens at other ports throughout New Zealand.

Glossary

Biodegradable: materials that can be broken down by the action of living organisms such as bacteria, into harmless constituents such as water and nutrients.

Biochemical Oxygen Demand (BOD): a measure of the amount of oxygen needed by micro-organisms and chemical processes to break a material down.

'Brown' wastes: in composting this term is used to describe wastes which are rich in carbon, such as dried leaves, sawdust, untreated wood shavings and ash, hay, peat, vacuum cleaner dust, shredded paper, egg shells or crushed sea shells. They provide a balance with wastes that are rich in nitrogen, such as food scraps, grass and plant clippings, blood and bone and seaweed.

Compost: a stable nutrient-rich soil conditioner made from the biological reduction of organic (plant derived) wastes.

Composting: the controlled biological decomposition of organic solid wastes under aerobic conditions. The process transforms organic materials into beneficial soil additives such as humus and mulch.

Decomposition: the breakdown of waste materials by bacterial action; in aerobic decomposition, the bacteria work in concert with oxygen, and total aerobic decomposition leaves only carbon dioxide, water and inorganic solids.

Drop-off recycling centres: facilities, often unattended bins, where individuals can deposit recyclable materials.

Dump-Tip: a site where rubbish is buried or left to decompose. Many old dumps have now been closed because of environmental problems and replaced with engineered sanitary landfills.

Garbage: an American word for solid waste comprising animal, grain or other food matter. Now generally used to denote general refuse or rubbish.

Garden waste composting: The composting of garden clippings, leaves, pruning and the like.

Green waste: organic or plant-derived waste. Commonly refers to food and garden wastes, especially garden wastes, as well as waste from food manufacturing firms.

Hazardous waste: waste material, which may cause a threat to human health or the environment because it may be one or more of the following: toxic, infectious, mutagenic (causing mutations), carcinogenic (cancer causing), teratogenic (causing foetal deformities), explosive, flammable, corrosive, oxidising, radioactive or ecotoxic.

Kerbside collection: the pick-up of refuse and/or recyclable materials from footpaths.

Landfill gas: the gas generated by decomposition (breakdown) of wastes, especially green wastes, in a landfill. It's main components are methane, a potent greenhouse gas which is also poisonous, flammable and potentially explosive, and carbon dioxide, also a greenhouse gas.

Landfill: an area designed, built, operated and maintained to dispose of solid waste to ensure no solid, liquid or gaseous materials create a health or environmental risk either on or off the site, for example to streams or underground waters.

Litter: mismanaged resources and rubbish. It is waste originating from human activities, which is left in the wrong place. It can be unsightly, polluting and directly harmful to fish, birds and marine mammals, as well as pose a health risk to humans.

Leachate: the liquid produced by the breakdown of solid wastes, particularly materials in landfills, especially where rain is allowed to enter the refuse. It has high BOD and may contain metals and other environmentally harmful materials from the waste.

Natural resource: valuable, naturally occurring materials such as soil, petroleum, wood, air, water or minerals.

NIMBY: acronym for 'not in my back yard', an often stated reason for opposing a proposed site for a potentially unpopular facility such as a landfill.

Non-renewable resource: a natural resource considered finite in supply because of its scarcity, rapid depletion or extreme length of time to reproduce. Minerals are a good example.

Organic waste: carbon-based wastes, including paper, wood, food and garden wastes (see 'green' wastes).

Recycle: the third step in the waste management hierarchy. Recycling refers to a set of processes for converting materials which would otherwise be discarded as waste into new products. This may be done once, several times or many times, thereby eliminating the need to use new, raw materials. For example, steel cans, aluminium cans, glass, paper and many other materials can be melted down and recycled into the same product over and over again (closed loop recycling). Plastics, by contrast, are usually made into a different product. For example, milk bottles can be made into insulation materials, mats or pots for plants (open loop recycling).

Reduce: the first step in the waste management hierarchy. Reducing waste means lessening the amount of waste generated, for example, by not using something or by using less of it. Lightweighting, or using thinner materials, is a way of using less material and thus generating less waste. Waste can be reduced by redesigning products and using different materials, or by behavioural changes.

Re-use: the second step in the waste management hierarchy. Re-use means using something again in its existing form for the same purpose or a similar one, without further manufacture. For example, wooden pallets used for transporting goods can be reused many times.

Solid waste: products and material discarded after use in homes, businesses, restaurants, schools, farms, industrial plants and other places.

Solid waste management: the entire process of collecting, sorting, storing, processing, recycling, reclaiming and disposal of refuse.

Transfer station: a place where waste collection trucks deposit waste from residential, commercial and industrial areas, and where householders may also bring their wastes directly. Recyclable or compostable items may be separated out from the rest of the waste stream or transfer stations. Household hazardous wastes may also be taken there. The wastes for disposal are then compacted and loaded onto large transporters to be taken to the landfill.

Waste: means any matter, liquid, gas or solid, which is unwanted by its owner or generator as having little or no economic value, even though it may be or include materials which can be re-used, recycled or recovered.

Waste minimisation or waste reduction: the process of creating smaller volumes of waste for disposal. It can be achieved by voluntary means, such as education or incentives, or by compulsory means, such as higher charges for waste disposal.

(Glossary terms taken from pages 44 - 49, "Treading Lightly on the Earth" Auckland Regional Council. Please refer to this booklet for a more comprehensive coverage of 'Waste' terms)



**Student
activities**

Welcome to the world of waste



Can YOU keep a promise? Yes? Read on...

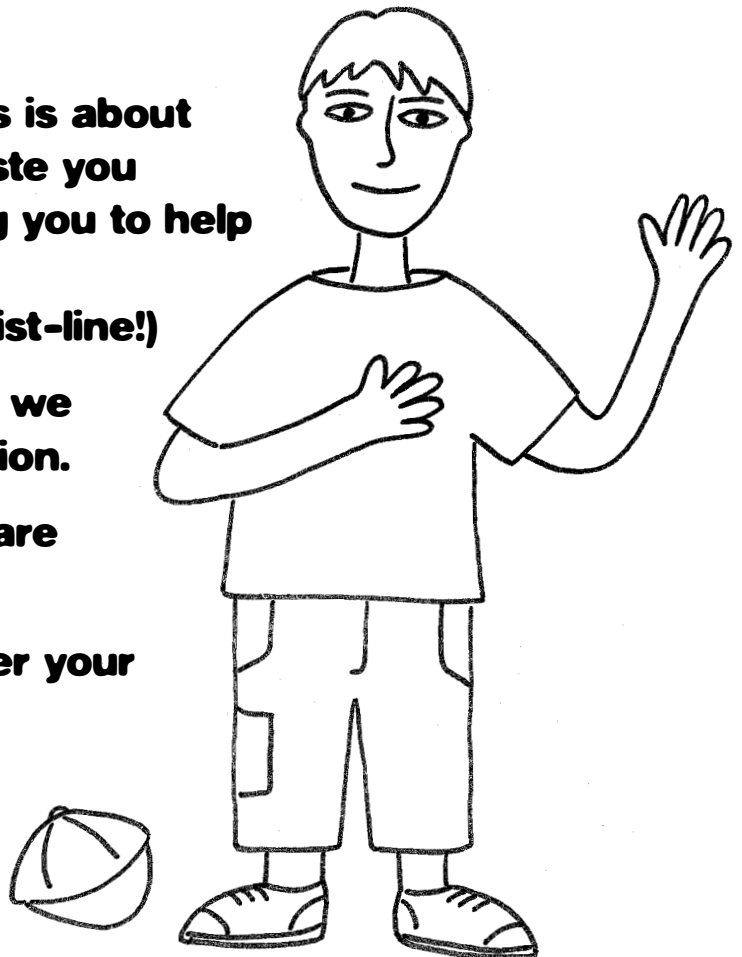
Hear ye, hear ye!

This 'Waste' part of City Issues is about helping YOU to reduce the waste you produce AND it's about helping you to help others to reduce their waste (as in rubbish and not their waist-line!)

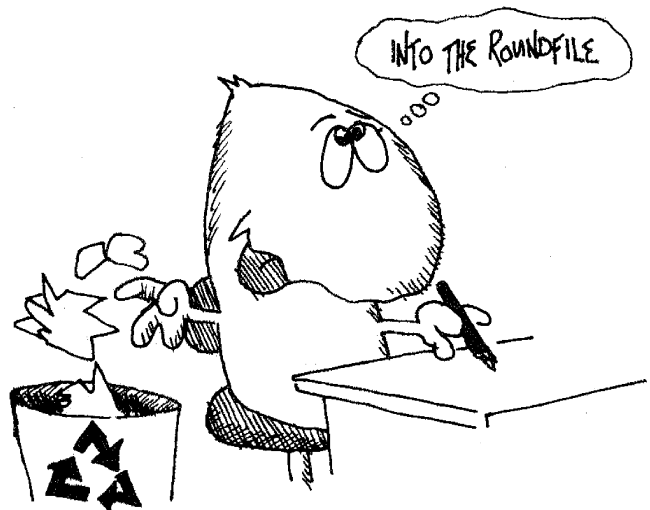
As we work through this issue we need to put our words into action.

We need to practice what we are preaching. It's a fact!

So, please place your hand over your heart and repeat this promise!



- I _____ (say your own name)
promise that I will not waste any paper while I am working on
City Issues
- I will use both sides of the paper
- I will share photocopies of activities whenever possible
- I will only use 'recycled' paper when I am brainstorming and
making notes
- I will drink only from a plastic, refillable water bottle as I work
- I will not 'down-load' endless pages of information about 'Waste'
from the Internet
- I will print from the computer only when I am very sure I need to
and I will print my 'draft' copies on the back of used paper!
- I will use the whiteboard or blackboard whenever possible
(that's if my teacher says it's ok to do so)
- I will **REDUCE, REUSE, RECYCLE** as much as I can
(after I find out what they mean!)
- I make this promise on _____ (date).



So, what do you know about waste?

(Gathering 'Before – Views'. This is what you think now.)

**Record your ideas for the following questions.
How about using 'recycled' paper to do this?**

You can write or draw your answers.

(Don't forget to make changes to the things you record as you work your way through the 'Waste' topic).



1 What is waste?

2 What are some other words for 'waste'?

3 Where does waste come from?



4 What happens to our waste? Where does it go?

5 Why has getting rid of our waste become a problem?

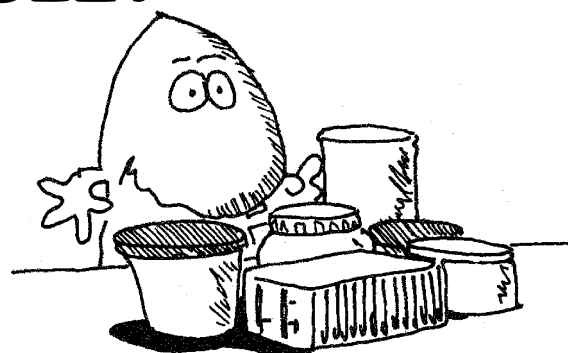
6 How was waste different 100 years ago?

7 Every person in New Zealand is said to produce 2.5 kg of waste every day. (Do you think this is true?)
What do you think most of this waste would be?



8 Why is it important for us to reduce the amount of waste we produce?

9 What does it mean to **REDUCE, REUSE AND RECYCLE?**



Get hooked into waste

YOU WILL NEED



- a photocopy of this sheet (PLEASE use the back of it for brainstorming activities!)
- people to talk to
- ears carefully tuned to a listening frequency
- something to write with

Fill in the 'Waste' questions with your own or other people's ideas.



Write, or draw five things you have put into the rubbish bin in the last 24 hours.

Ask three people what they have recycled recently. Draw their answers in the boxes.

State what you, or a classmate, think it means to reduce the amount of waste we produce. _____

The big problem with getting rid of waste is _____

Everyone needs to think of ways of reusing things.

List two ideas for reusing a yoghurt pot.

① _____









② _____

Keying into waste words

(Still looking at what we know now).

This task could be completed by individuals, in small groups or by the whole class. (But please don't waste any paper!)

Remember to make changes to your definition as you work through the topic.

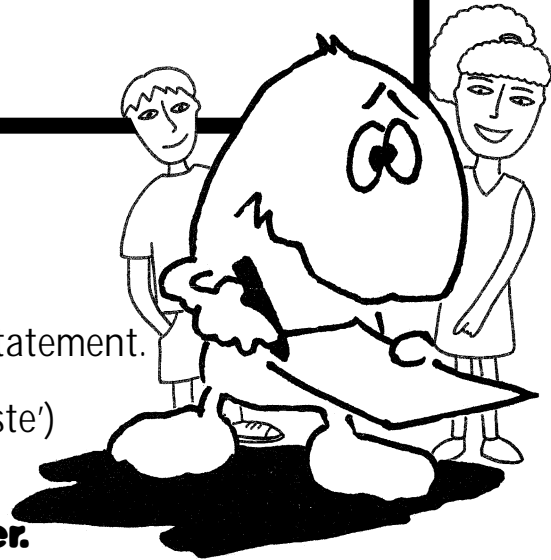
What I (we) think this word means now		
	Waste	
	Reduce	
	Reuse	
	Recycle	
	Composting	
	Landfill	
	Waste management	
	Kerbside recycling	

Check out your attitude!

Put your mark here!

Look at the following statements. Put a tick ✓ above the opinion line to show how you feel about the statement.

(Check if your opinion changes as you work through 'Waste')



1 The waste I produce doesn't really matter.

Strongly disagree | Disagree | Not sure | Agree | Strongly agree

2 Dumping paper is a waste of trees.

Strongly disagree | Disagree | Not sure | Agree | Strongly agree

3 Why should I worry about recycling when heaps of other people don't?

Strongly disagree | Disagree | Not sure | Agree | Strongly agree

4 Getting rid of waste is the local council's problem, not ours.

Strongly disagree | Disagree | Not sure | Agree | Strongly agree

5 Reducing waste is really important for the environment.

Strongly disagree | Disagree | Not sure | Agree | Strongly agree

Share what you have done with the rest of your class.

Rocking, rolling and riding into the three R's of waste!

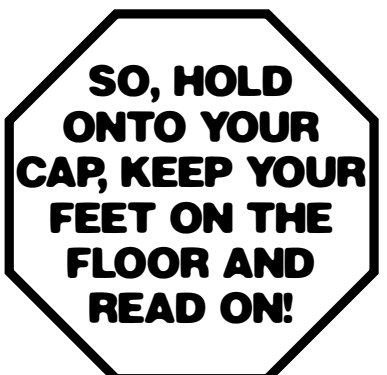
By now you will have been

- thinking
- talking about
- writing
- and drawing 'wastey' things.

But (there's more)

**...here is where you get to do a really big and extremely
IMPORTANT project about the three R's of waste**

**Reduce
Reuse
Recycle**

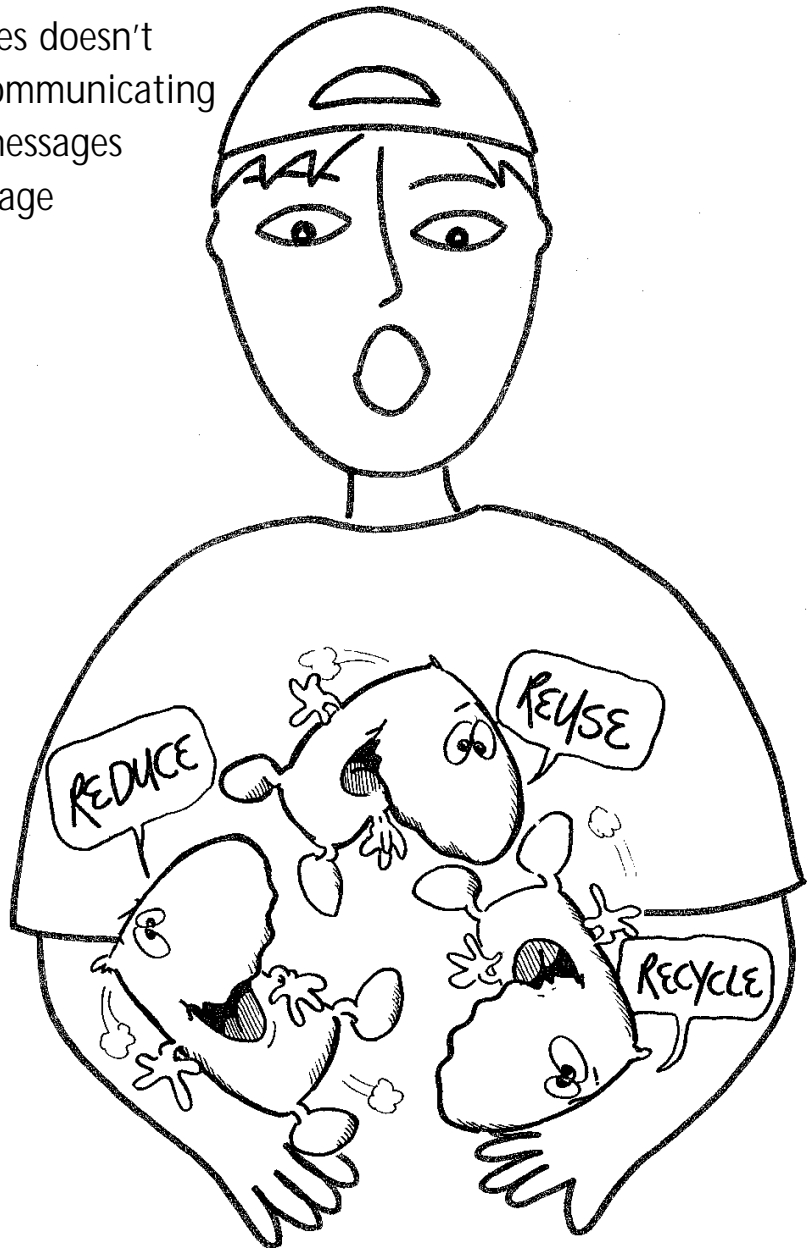


YOUR TASK ➔

is to redesign the Auckland Regional Council **REDUCE REUSE AND RECYCLE** brochures for:

- personal use (the things that individuals can do)
- home
- school
- your local community

(If the idea of producing brochures doesn't grab you, create other ways of communicating these important environmental messages e.g. produce a board game or a page for the Internet.)



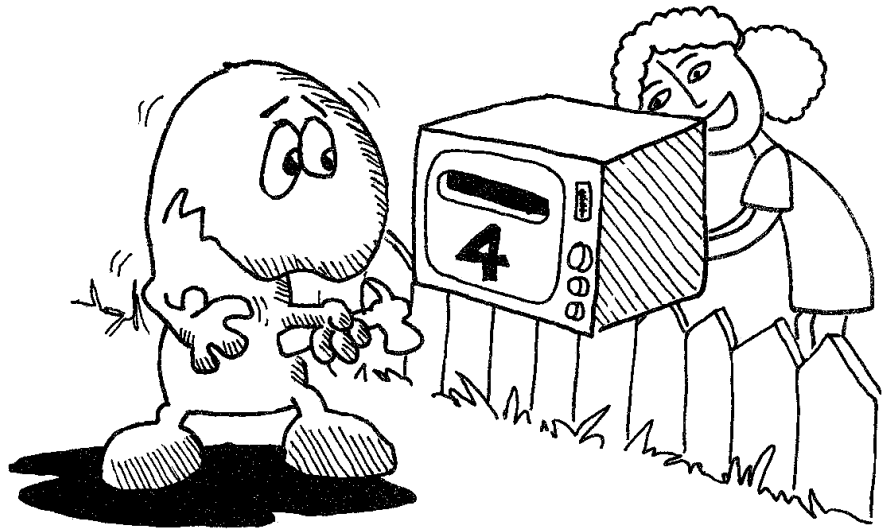
THERE'S MORE ➔

Let the wild rumpus begin

(The Project)

You will need to do the following:

- 1 Find and read 'The R's defined!' If you really understand the three R's it will make your task easier (and we love making things easier for you hard working students!).
- 2 Find and read the following brochures produced by Auckland Regional Council.
 - Waste Reduction – Information sheet 1
 - Reuse – Information sheet 2
 - Recycling – Information sheet 3
 - Plastic Recycling – Information sheet 4
 - Paper Recycling – Information sheet 5
 - Aluminium Recycling – Information sheet 8
 - Want to help the environment – Information sheet 13
- 3 Ask other people to help you with this task, unless you want to produce all the brochures yourself. Why not assign different groups to work on each brochure?
 - Plan who is going to do what
 - Assign tasks
 - Work out a deadline and stick to it
 - Make sure everyone knows what has to be done



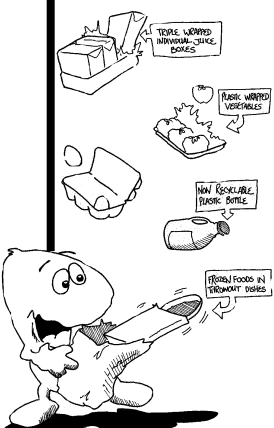

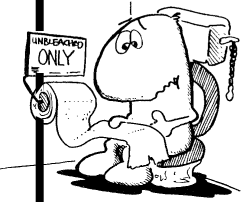
- 4 Collect heaps of ideas of really practical things that can be done to reduce, reuse and recycle. Ask other classes for ideas, talk to family members, use the Library and browse the Internet.
- 5 Plan your work carefully. This is not pretend. You are actually working towards making environmental changes yourself and also to help others to change the things they are doing. Remember the key message about waste:

**REDUCE THE AMOUNT OF WASTE
WE ARE PRODUCING**

This means that we will use fewer resources - which helps the environment and also helps us.



The R's defined!

The R Word	What it means / definition	A few recycled examples of what you can do
<p>Reduce</p> 	<p>The best way to decrease the amount of rubbish we produce is not to produce it in the first place.</p>	<ul style="list-style-type: none"> ● Share copies of 'worksheets' ● Use a blackboard or whiteboard wherever possible ● Start a reuse box for scrap paper ● Use an old exercise book for drawing ● Use both sides of the paper ● Use refillable items for juice bottles, lunchboxes etc. ● Reuse plastic bags
<p>Reuse</p> 	<p>It's about using something again and again and again and</p>	<ul style="list-style-type: none"> ● Give away / resell old toys, clothing, books, magazines ● Find creative ways of using plastic and glass containers ● Make useful articles, presents, toys, ornaments from discarded plastic or metal containers ● Use 'junk' materials to create some awesome art
<p>Recycle</p> 	<p>Recycling is when materials from waste products are reused to make new and sometimes different products.</p>	<p>When recycling products, you need to sort them carefully. The following items can be recycled:</p> <ul style="list-style-type: none"> ● plastic items – marked 1 and 2 ● aluminium and steel cans ● paper ● glass bottles ● clothing ● used motor oil ● telephone books ● car batteries ● car parts

A checklist to help you produce amazing brochures

- 1 Are the key messages clear, strong and positive? (Will people understand why it is important to do whatever you are asking them to?)
- 2 Is the design eye catching?
- 3 Is the brochure easy to read? Is the language 'pitched' at the right level?
- 4 Have you included lots of practical advice and suggestions? Will people know exactly what they can do to make positive environmental changes?
- 5 Have you used slogans and catchy titles to capture your readers?
- 6 Do your illustrations help to present the message?
- 7 Have you been creative? Waste doesn't have to be boring!

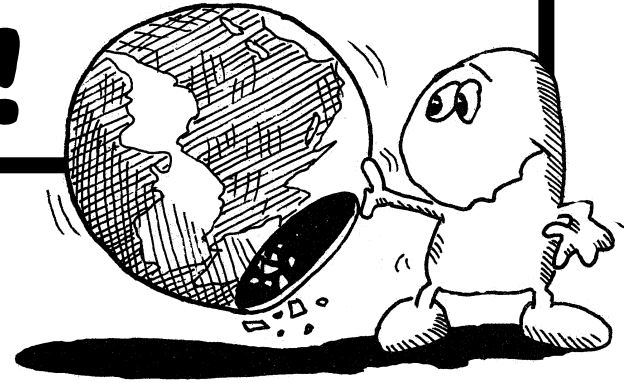
When it's time to LAUNCH your brochure(s) give it everything you've got!

Present your work with:

- song
- drama
- competitions
- speeches
- guest speakers.



Help save our resources!

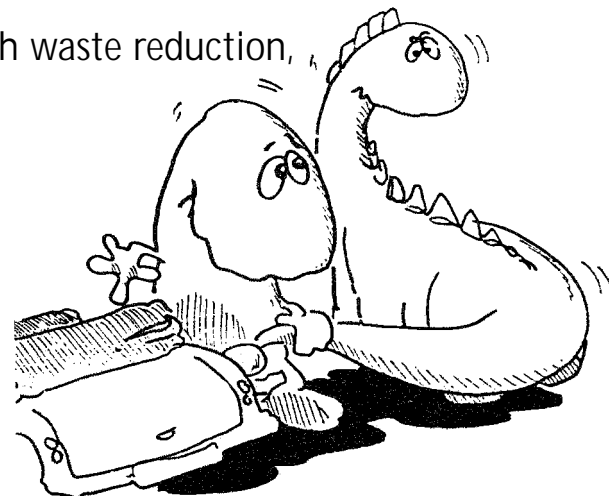



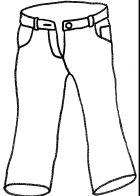


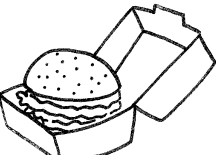

READ this important information.

- Natural resources are naturally occurring materials that form our earth. These materials include air, water, soil, rocks, timber, plants, minerals, fossil fuels and wildlife.
- Each person needs to find ways of caring for the earth and its resources.
- People are placing huge demands on the earth's resources. Some resources are already running out and are expected to completely run out in this century. Oil for example, is likely to become very scarce and expensive in our lifetime.
- Some resources, such as plants and animals, can be slowly replaced if we use them wisely and plan for the future, provided they are not affected by drastic climate change or by human abuse. They are renewable. Renewable resources also include sunlight, wind and water.
- Some resources such as oil, minerals and fossil fuels are non-renewable, or will only be recreated over millions of years.
- As we keep using our resources we create more and more waste. (Unwise resource use creates unnecessary waste).
- We can help to conserve our resources through waste reduction, reusing and recycling.

Complete the chart opposite

(You may have to do some research to help you).



Item	Resources used to make this item	Say whether the resources are ●Renewable ●Non-renewable	⊗ ⊙ if this item could be reused or recycled. Say how.
Soft drink can 			
Cotton jeans 			
Glass bottle 			
Plastic bag 			
Hamburger 			
Paper 			

Complete this statement:

We need to use our resources wisely because _____

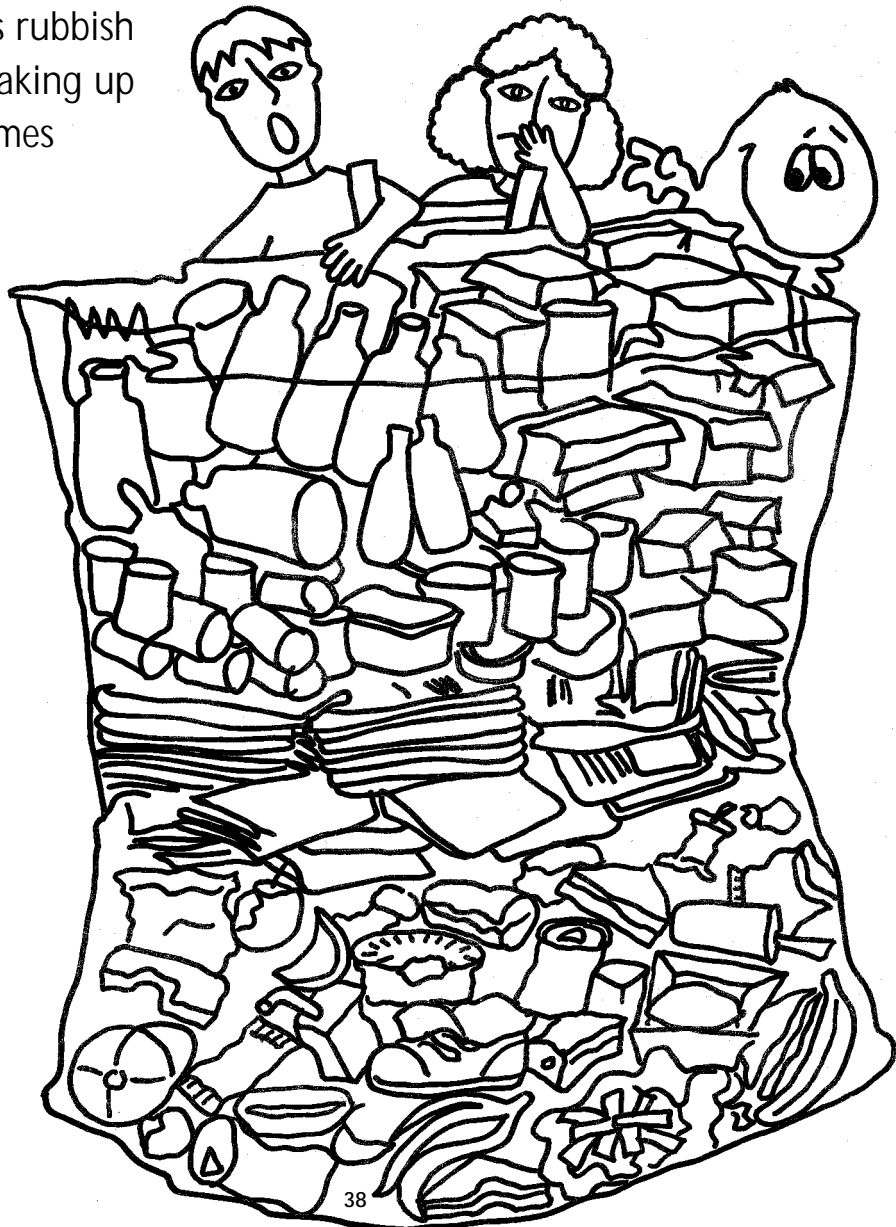
So, what's in your rubbish bin?

YOU WILL NEED



- the whole class
- protective gloves
- five days of rubbish discarded by the class
- a large sheet
- heaps of fresh air

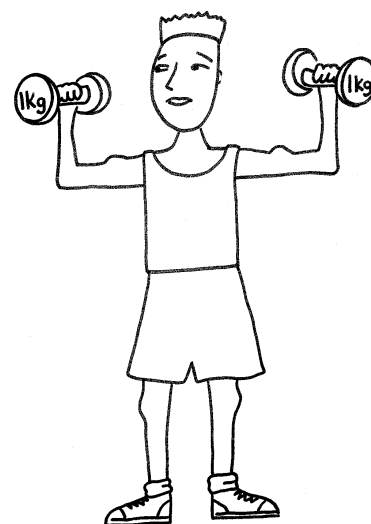
(* Keep some of this rubbish for the activity 'Breaking up (or down) is sometimes hard to do')



Getting down to the nitty gritty

- Guesstimate the weight of the rubbish before you actually weigh it.
- Dump the rubbish onto the sheet.
- Sort the rubbish into categories agreed upon by the class e.g. hard plastic, soft plastic, paper...
- Sort it again into groups of things that could be reused or recycled. Which items didn't need to be thrown out? Which could have been used in a different way?
- Brainstorm ideas for reducing the amount of waste that the class is producing. **Keep this list alive and growing as you continue to complete 'Waste' activities.**
- Finally. Take a look at how the problem is growing. **It has been estimated that every day each person produces 2.5 kg of waste.**
 - a** Multiply the above figure by the number of people in your class. _____
 - b** Each person in the class should multiply this figure by the number of people in their family. _____
 - c** Add the totals together. What have you got? That's right - one big pile of rubbish! _____

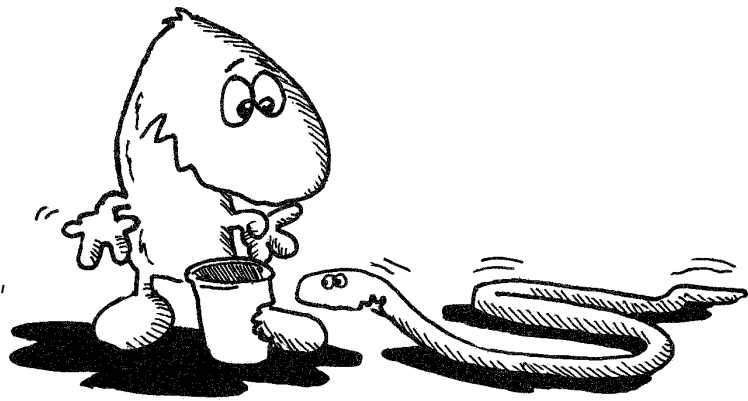
Actually there's more. Don't stop here.
Each student should repeat this activity at home.
Ask each family to start to think about ways of reducing their waste.



Breaking up (or down) is some- times hard to do

There's good news...

Some of the waste we produce naturally e.g. food scraps, breaks down and rots away - with the help of bacteria, moulds, fungi and a host of mini beasts.



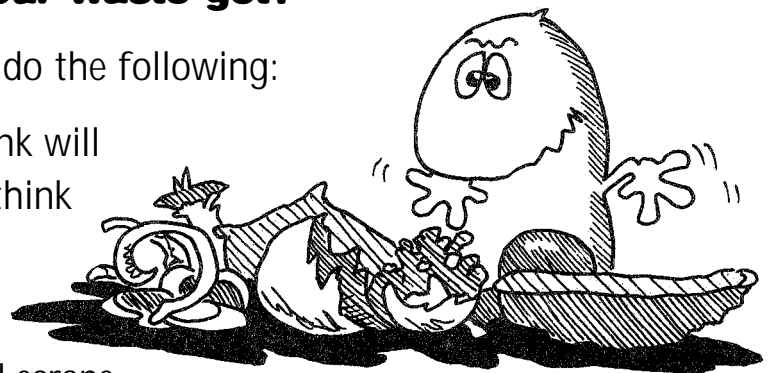
And there's bad news...

Some of our waste either never breaks down or it takes a very, very, very long time, as in thousands of years, to break down e.g. plastic bags.

So what sort of future has your waste got?

Get out your pile of waste again and do the following:

- 1 Make a list of the things you think will break down and those that you think won't.
- 2 *Bury a selection of your waste items along with a range of food scraps.



Make sure you include every day 'waste' items such as paper, cardboard, plastic bags, gladwrap, potato chip bags, aluminium cans, and coke bottles.

* This will work just as well if you cover the items with a large piece of tin, but you must be able to put it where it won't be disturbed. Covering the items this way makes them easier to view.

3 Predict how quickly what you have buried will rot away.

4 Revisit the burial site after two weeks, one month, two months..... six months.....one year. You decide on the time frame. Make sure you keep a careful record of what is happening to the waste items.

5 It's not the end.

Take a BIG step further by talking to your family about starting a compost area, or worm bin / farm at home (if you haven't already got one) and doing the same at school.



Start a composting area

YOU WILL NEED

- Information about composting (Auckland Regional Council can help you with this).
- To put an action plan together if you decide to make this a school project BUT don't let a bit of planning stop you from doing something really worthwhile!



And... there's more.

It's not all bad news about packaging!

Many companies are working on producing packaging that is far, far more environmentally friendly. They are working towards producing packaging that will eventually break down or that will break down faster than it is now.

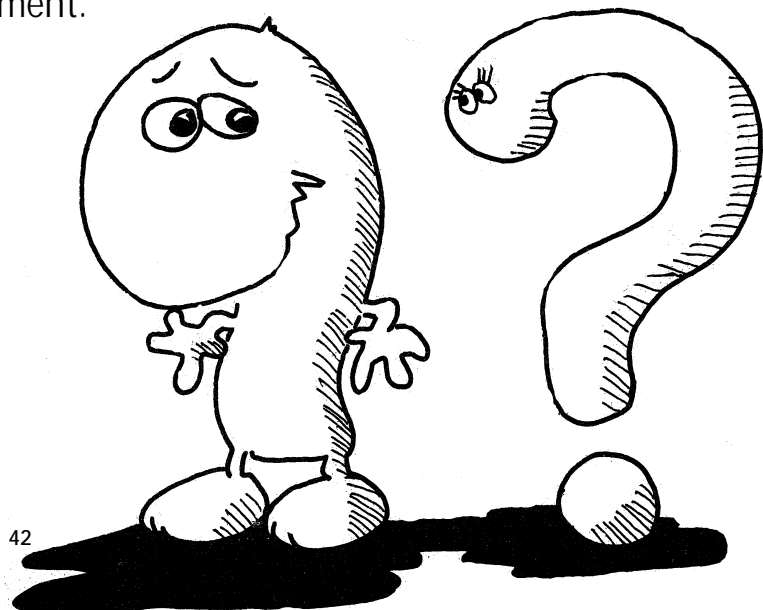
How about completing some research about this whole topic?

You might just be amazed at what you discover!

To compost or not to compost, that is the question!

(A.K.A The compost fact file).

- Compost is a natural fertiliser and soil conditioner.
- Compost can be made at home or school from organic wastes.
- Soil micro-organisms, insects and earthworms convert (change) wastes into a rich humus.
- Composting adds nutrients and texture to soil.
- Composting is easy.
- Composting reduces the amount of rubbish sent to landfills.
- Compost bins can be easily made from wire, plastic or wood.
- Food and garden wastes such as egg shells, grass clippings, soil, fruit peels, tea bags, seaweed, sawdust and shredded paper can be placed in a compost bin.
- Composting is good for the environment.
- Anyone can learn how to compost.



Anyone for a cup of worm tea?

(Don't try to worm your way out of this one).

WHAT? Vermicomposting! (Try saying that 10 times quickly). It's simply about worms eating your food waste (not forgetting pieces of cardboard and newspaper) and turning it into:

Vermicasts: a wonderful soil conditioner

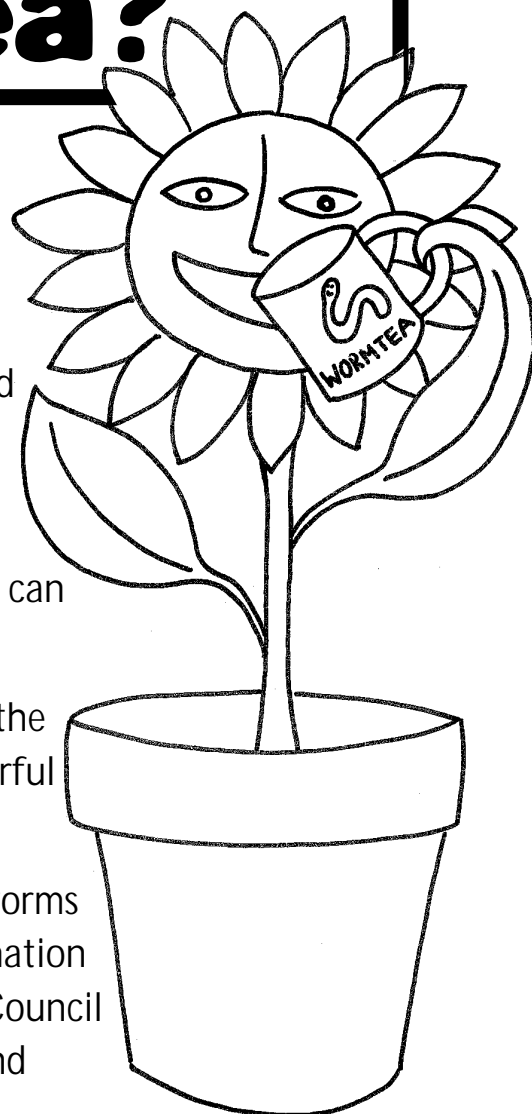
Worm tea: the liquid waste from worms that can be used to water and fertilise plants.

WHY? It's a great way to recycle food scraps and at the same time you can learn all about how wonderful worms are and how to care for them.

HOW? You'll need a bin or a container to keep the worms in, a small number of worms and more information about Vermicomposting. (Auckland Regional Council has information about where to get worms and wormeries).

WHERE? You don't need to keep your wormery in a garden - it can be kept in, or near, your classroom. (It shouldn't smell!)

WHEN? Get organised and start a wormery. Find out where to buy one and how you can raise the money. (OR you can make your own - instructions enclosed!) Sell your rich compost and worm tea to buy / make more layers for your wormery.



The choice is yours



Does it really matter what you choose to eat?

If you had to choose between an ice cream in a cone and an ice cream in a wrapper, which would you choose? (Ok, ok, so it depends on the flavour!)

Why is one better for the environment than the other? What's the difference? (Think waste!)

REMEMBER



Remember the part in the 'City Issues' video where Michael chooses an ice cream cone over one in a wrapper? The point is that an ice cream in a cone doesn't produce any waste, whereas an ice cream in a wrapper leaves the wrapper and the stick. Some wrappers are worse than others because they won't decay / rot down for a very, very, long time.

Does one person's waste really make all that much difference?

The magic of maths

Measure the area of the ice cream / ice block wrapper and then start multiplying.

Number of ice creams being eaten	Total number of people	Area of ice cream wrapper	Number of ice block sticks
One person			
Everyone in your class			
Everyone in the school (including the teachers)			

Finish this part of the activity by answering a few questions.

- 1 When someone eats an ice cream in a wrapper what do they usually do with the stick and the wrapper?
- 2 What could they do to help reduce waste?
- 3 How could you reuse this 'waste'? List some creative and interesting ways!



The challenge (The Choice is Yours ...continued)

The aim of this challenge is to reduce the amount of waste by buying goods with less packaging. This challenge is about **YOU** convincing **YOURSELF** and others to make environmentally wise decisions about what to buy.

The focus here is on sweets, ice-creams and snack food.
(Things that might be near and dear to your heart).

The target is

- you
- your family
- your class
- the community



First things first. Who's eating what?

- Make up a survey to find peoples preferences for:
 - sweets
 - ice cream
 - snack food
- Ask questions that will help you to discover how people feel about the cost, packaging and, of course, the taste! (Think: You want to find out why people eat the things they do. What influences the choices they make?)
- Survey up to ten people.

Moving right along. What to do with the results.

- Make a graph of the results.
- Ask yourself - How much waste is produced by these items?
- How much of the waste can be
 - reduced
 - reused
 - recycled?

Keep these very important thoughts in your head while you get into the action part of the challenge.

Time to cook up some ideas

(The Challenge – continued)

- 1 Make a list of ways the waste could be reduced when eating sweets, ice cream and snack food. What are some positive alternatives?
- 2 Carry out some supermarket research. Find out which ice cream wrappers are better for the environment, and which snack foods and sweets have the least amount of packaging (or none at all!).
- 3 Make some decisions about what YOU are going to do to reduce the amount of waste you produce.

Set yourself some goals that you can actually achieve. Don't make it too hard at first, such as -

" I will never eat another ice cream in a wrapper in my life"- yeah, right!

How about these for a start?

- Once a month, buy an ice cream cone or an ice block with a more environmentally friendly wrapper, ie one that is made of paper and will eventually 'break down.'
- At least once a week eat a piece of fruit or make a sandwich, instead of buying an individually wrapped snack.
- Choose sweets with the least amount of packaging.

Make some decisions about what you would like to encourage others to do to reduce waste and then...

GO ON THE **E.P.E** TRAIL

Educate – talk to people and tell them why they might need to change the things they buy. Give them a reason to change their behaviour.

Promote your ideas - make a poster, create a brochure that will help others to change and set their own goals about helping the environment.

Encourage people to be different. Encourage yourself by keeping a record of the positive things you have done to make a difference.

Litterless Lunches

The aim of this activity is to reduce the amount of waste produced in your school at lunchtime.

There are three parts to this activity.

There must be a reason for doing the things we do

Make a list of reasons why it would be good to reduce the amount of waste being generated in the school at lunchtime.

Part One - Finding out how much waste is being produced now

- 1 Work out a way of counting and recording the amount of waste left each day at lunchtime.
- 2 Make some predictions about what you think you will find. How much? What kind of waste? What will there be the most of?
- 3 Create 'waste' graphs or record information on the Waste Tally sheet.
- 4 Monitor the amount of waste over a set number of days.



Part Two - Time for action

- 1 Discuss how each person can reduce the amount of packaging and waste they have in their lunchbox.
 - Make a list of ideas about how to reduce lunchbox waste. (The Auckland Regional Council Litterless Lunch Day might help to get you started). It's important to give people alternatives (if we shouldn't wrap our lunch in Gladwrap, what can we do instead?)
 - Get a group to work on creating some new recipes for the litterless lunchbox.
- 2 Plan a campaign (on recycled paper of course!). How are you going to get others to change? What will you do to convince people that having a litterless lunch is a good thing? Your environmental messages of Reduce, Reduce, and Recycle needs to be very strong!

You'll probably need to think about doing things such as:

- Creating posters
 - Sending newsletters home
 - Talks in assembly
 - Talks to individual classes
 - Buddy-up with a Junior class
- 3 Set a date to start your campaign.
 - 4 Make sure that students have containers for sorting out waste that they can reuse or recycle. (How about having a competition to see who can come up with the most creative ideas for reusing bits and pieces of the lunch litter?)

Part Three - Did you make a difference?

- 1 Monitor the amount of waste being generated each day over a set number of days.
- 2 Record the information on tally sheets and / or graphs.
- 3 Share the results. Tell the people involved in this action about what is happening and about changes that are being made.
- 4 Encourage other students to keep going! Design and present awards.

There's more!

(This could be the beginning of something beautiful).

- E-x-t-e-n-d the activity by getting each class to look at the amount of waste they produce in their room. Challenge them to look at how they can Reduce, Reuse, Recycle their waste. Have an interclass competition to see who generates the least amount of waste.
- Challenge your family to have a litterless lunch twice a week (sitting in a café doesn't count!).



**YOU CAN
MAKE A
DIFFERENCE**

School lunchtime - waste tally (////)

ITEM	DAY 1	DAY2	DAY3	DAY4	DAY5	TOTAL
Soft plastic						
Hard plastic						
Glass						
Milk or juice cartons						
Cardboard						
Paper						
Drink Cartons						
Foil						
Other						

Most common packaging _____

What can be used instead? _____

Least common packaging? _____

What can be done to reduce the packaging? _____

Trash into treasure

**Don't throw that junk away.
Make a 3 dimensional sculpture
or model!**

YOU WILL NEED

- People to work with
- A collection of 'junk' material
- A mind-blowing, totally creative, zany, weird and wonderful idea for a model that you can make out of your 'junk' collection. (Hey how about a futuristic way of travel?)
- Glue, scissors, tape etc to make everything 'hang' together
- A record of the materials you used for your sculpture / model
- A description of your sculpture / model. This will be part of your display.
- To name it
- A place to display your creation
- An audience!



**Imagine if you
had to 'keep' your own rubbish.**

**Imagine it
piling up in your backyard.**

**Imagine how it
would look.**

**Imagine how it
would smell!**



DO you ever stop and think about what happens to your rubbish?
(Out of sight, out of mind!) Well, just in case you get asked about it,
here are a few tasks for you to do.

- 1** **Locate the 'Trash Map'.** You have two minutes to do so (before this page self-destructs...ok. so, it's just a joke!)
- 2** **Have a quick look at the map.**

3 READ the following definitions:

Drop-off recycling centres - usually unattended bins where people can leave recyclable materials such as paper, aluminium cans, glass and plastics.

Kerbside collection and recycling - the pick up of waste and recyclable materials from the footpath. This is also known as a co-mingled collection.

Landfill - an area designed, built, operated and maintained to dispose of solid waste.

Transfer station - a place where waste collection trucks deposit waste (household, commercial and industrial) and where householders may bring their waste directly. Recyclable wastes may be separated out and the rest of the waste compacted and taken by large transporters to the landfill.

Hazardmobile - a visiting truck where people can drop their hazardous wastes e.g. car batteries, paint etc.

4 Now look carefully at the map.

- Find the Transfer Station closest to your school and / or home.
- Find the Landfill nearest to your school?
- Where is your nearest Drop-off Recycling Centre?
- What can you take there? (Make a list in your head)
- What day of the week is your rubbish collected?

Finished? Well done.

Want some more work?

Good for you.



Planning your Own Investigation about Waste

Without a doubt, you will have your own questions about waste and waste issues. You could use the 'Work Plan' to help you organise personal / group investigations!

Work Plan

Name: _____

Date work started: _____ Date work finished: _____

Main theme / topic: _____

My research / investigation / experiment will be about: _____

My main question is: _____

Other questions I need to ask are: _____

Some key (important) words I need to think about are: _____

Things I plan to do to find the answer _____

I can get information and help from: (Possible sources: people, written material, photographs, computer / electronic media etc.)

My work will be presented to _____

I am going to present / share my work in the following ways:

Other ideas / plans / brainstorm _____

Personal goals I have for this study are _____

Work plan seen by: _____

a) Pupil _____ b) Teacher _____

Comments / suggestions given: _____

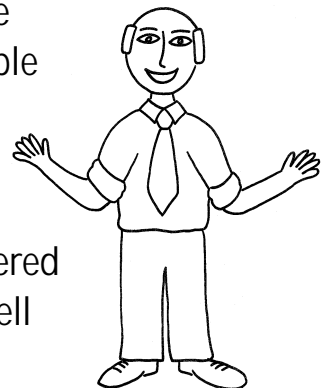
One person speaks at a time please!

A local contractor has applied to the council for a resource consent to open up a landfill on nearby farmland. Several different members of the community have requested to speak at the consent hearing so they can present their views.

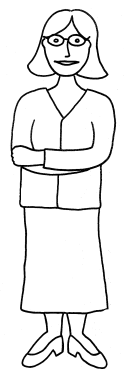
Below are a few of the views that could be presented in such a case. Divide the class into different groups. Each group should choose a viewpoint and research their case to gather more information to expand their argument. When the group is ready they choose a spokesperson to represent their group and give their argument.



Landowner - My farm is not profitable because of its small size and the old quarry site, where the landfill will be, has been unusable up to now. Leasing this piece of land will enable me to have a better lifestyle and I will be able to send my children to a private school. I'm convinced that the landfill will not make any smell or cause any contamination. Within four years it will be full and covered over and I'll have more land to farm! No one will be able to even tell that it was a landfill site.



Local School Principal - I am worried about accidents that may happen to my pupils as they walk to school. With all those trucks full of rubbish there's bound to be an accident and the fumes they create will make it unhealthy for pedestrians. People will move out of the area because they don't want to live near a landfill and the school role will drop. This will mean that we won't be able to have as many teachers and that will be disastrous for the school.



Local Iwi Representative - Wai is tapu to us and we are concerned that over time poisons will leach out of the landfill and will surely contaminate our beautiful local streams. Creatures that are precious to us such as eels and fresh water crayfish will be unable to survive. It's happened in many other places and we must not allow this to happen in our area.

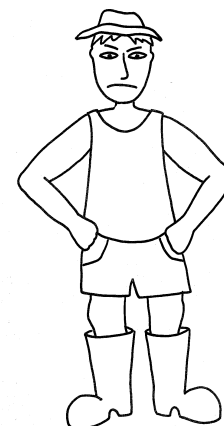


Local resident Mrs Scott - mother of two pre-schoolers -

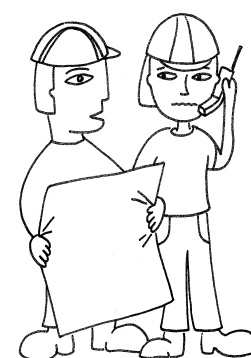
We bought a house in this area five years ago so that we could have a quiet, safe environment for our children, but having a landfill here is going to change all that! The noise of the trucks will keep the children awake, the fumes will be unhealthy and could give them asthma. My washing will get dirty from all the dust stirred up by the trucks, and the smell will make playing outside really unpleasant for the children. All that decaying rubbish is likely to bring rats and mice into the area! I'll be a nervous wreck worrying about the health and safety of the children!



Neighbouring Farmer - My family have been dairy farmers on this land for the last one hundred years, supplying milk for the city of Auckland. If this landfill goes ahead my grass will be covered in dust and dirt from the trucks and my cows won't want to eat the grass. This will mean that milk production will fall and I'll make even less money - I'm only just scraping by as it is! I farm because I love the fresh air and the peace and quiet - a landfill next door will change all that!



Landfill Operator - This is an ideal spot for a landfill. Road access is good, which will definitely make it easier for the trucks moving in and out of the site. Local residents needn't worry about problems such as bad smells, litter blowing out of the site, water pollution or methane gas problems as this is the third landfill I've operated - my track record has been perfect! I've never yet had a complaint about the way I've operated a landfill. Before the locals know it, they'll have a beautiful green pasture to replace this ugly quarry site.



School Environmental Group - We absolutely don't want a landfill in this area. We want a better environment and the landfill is not going to help to give us that. Our group has been working hard to encourage people to do positive things to help the environment, like reducing waste, recycling, planting more native trees - we've even got a Wai Care group organised. This landfill will just bring terrible problems.



Let's hit the supermarket!

The supermarket is important to all of us and is a good place to look at ways we can reduce waste. Here are some projects you could get your teeth into!



Shop for less!

- Absolutely true
- Not all packaging in the supermarket is necessary
 - Less packaging means less waste
 - Less waste is GREAT for the environment!

YOUR TASK

- 1 Visit the supermarket and carry out a survey to discover which goods have too much packaging. **At the same time you can think about ways packaging can be reused and / or recycled.**
- 2 Carry out your survey in different areas of the supermarket, such as:
 - Fruit and vegetables
 - Dry goods
 - Meat section
 - Convenience foods

- 3 Form your own conclusions based on the observations you make.
- 4 Make some recommendations based on what you have learnt.

For example:

- Only buy goods with packaging that you know can be recycled.

- Buy in bulk (less waste)
- Buy goods with less packaging
- Write to manufactures and ask if they can use less packaging
- Eat less (just kidding)

- 5 Go on the E.P.E trail again

- **Educate** -talk to people and tell them why and how they might need to change the things they buy at the supermarket. (You must give them a reason to change their behaviour).
- **Promote** your ideas about supermarket shopping and waste reduction- make a poster, create a brochure that will help others to change and set their own goals about helping the environment.
- **Encourage** people to be different. Encourage yourself by keeping a record of the positive things you have done to make a difference.

Too many plastic bags

- ? Ever noticed the number of plastic bags you get at the supermarket?
- ? Ever stopped to think that by using less plastic bags you would actually be doing something to help the environment?

This challenge offers you (and your family) the chance to reduce the number of plastic bags you use when you are supermarket shopping. It's easy and it could be fun!

Keep in step

- 1 You will definitely need the help and support of your family for this project so talk to them about what you want to do. (Remember it is really important to give people a reason for changing the things they do, so have the reasons sorted out in your own mind.)
- 2 Count the number of bags your family is using now. You will need to do this for one month! Use the Supermarket Plastic Bag Usage Record to help you.
- 3 With your family, plan how to reduce the number of bags you use at the supermarket. You might consider the following:
 - Don't put fruit and vegetable into separate bags - have them packed into one or two big bags
 - Ask for fewer bags to be used when your groceries are being packed
 - Pack your groceries into reusable cardboard boxes
 - Make some family shopping bags from fabric!
- 4 Put your plan into action and keep track of the number of bags you use over one month.

- 5 Discuss the results with your family.
- 6 Set goals for further reduction of plastic bag usage.
- 7 **Go back to number four and start again!**
- 8 Challenge your neighbours and extended family to do the same.
- 9 Start a new plan of action to reduce plastic bag use any time you go shopping.



How about writing to supermarket managers asking them to recycle shopping bags?

Supermarket plastic bag usage record

L = large supermarket bags (usually with handles)

S = smaller bags (usually without handles) used for fruit, vegetables, bulk bins

First Month (What's happening now?)			
Week / dates	Bag Type L or S	Number of plastic bags (Tally ///)	Total
	L		
	S		
	L		
	S		
	L		
	S		
	L		
	S		

WASTE



Second Month (What's happening now?)

Week / dates	Bag Type L or S	Number of plastic bags (Tally ////)	Total
	L S		
	L S		
	L S		
	L S		

How to build a mini-composter

MATERIALS



- Small piece of fence or chicken wire (approximately 32cm x 58cm) from your local hardware store
- String
- Small used piece of plastic sheeting or carpet to cover the bin
- Food scraps, leaves, grass clippings, wood chips, (see Compost Recipe below for a detailed list).

Instructions

- Tie the ends of the wire together to form a square. (see Figure 1)
- Use the recipe below to make compost.

Compost recipe

What to compost:

“Greens” – nitrogen-rich wastes: Kitchen food scraps, fruit and vegetable peels, coffee grounds, tea bags, grass and plant clippings, hair, fur, animal manure, blood and bone, seaweed, fish bones, chopped weeds (less noxious varieties).

“Browns” – high in carbon and other elements: dried leaves, sawdust, wood shavings, hay, peat, vacuum cleaner dust, shredded paper and newspaper, egg shells and crushed sea shells, wood ash.

What to keep out of compost:

Meat, grease, fat, dairy products, large bones, food packaging, plastics, treated wood products, noxious weeds, diseased plant material, underground stems, coal ash.

Layer: "Greens" and "Browns" (see Figure 2)

Add: soil or finished compost, water

Continue: to layer the above ingredients

Cover: with a sheet of dark plastic

Cook: for a few days under the plastic

Check: that pile is moist, add water if it's brittle or dry

Turn: the heap as often as you feel like it (once / week, once / month) to allow for air to mix with the compost. Check the moisture.

Repeat: the process of "cooking and turning" until the pile achieves the consistency of brown, crumbly soil.

Add to gardens, indoor plants and flower boxes.

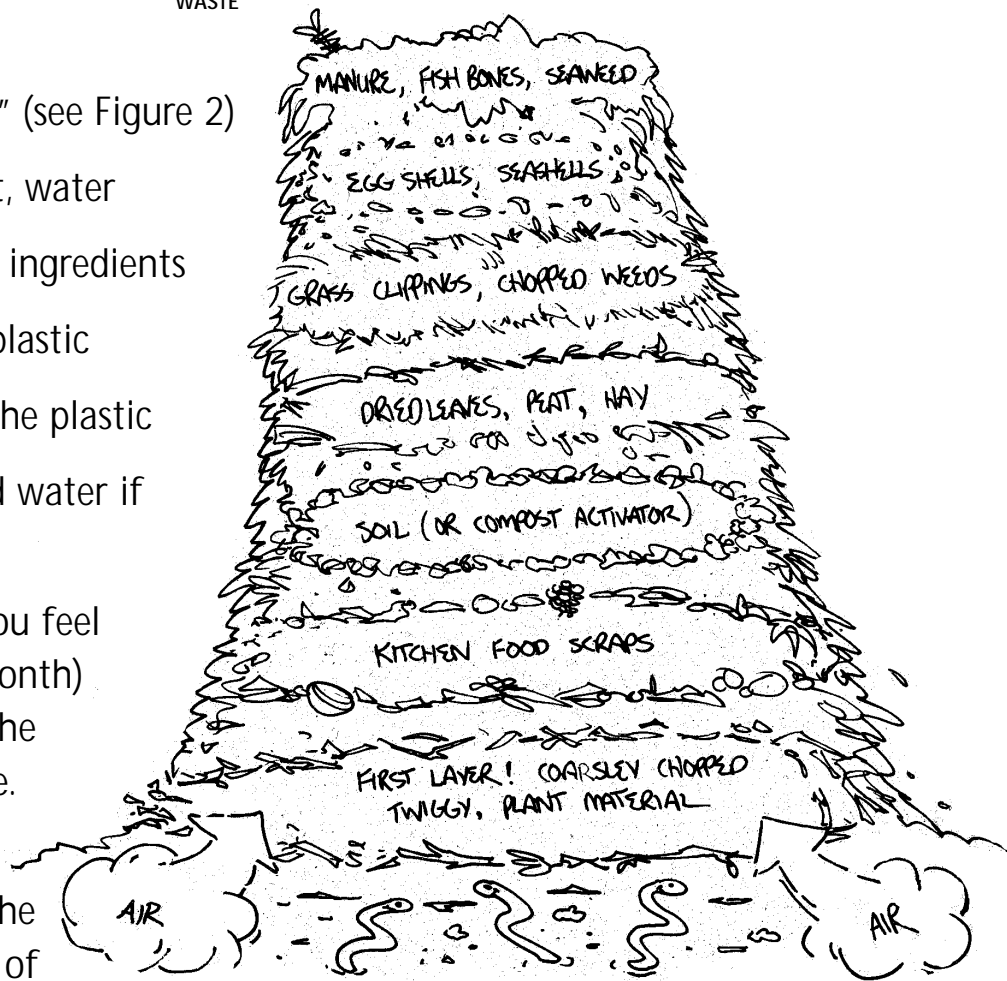


FIG 2

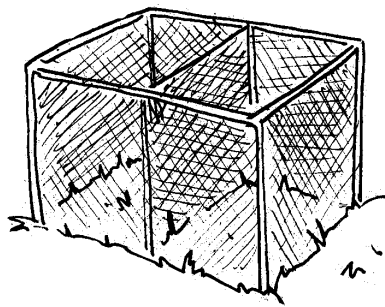
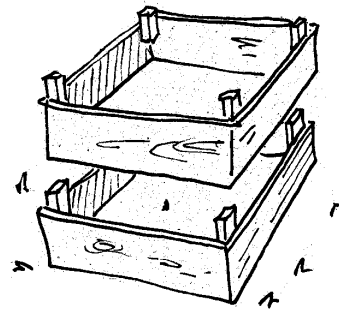


FIG 1



Common compost concerns & solutions

Concern: rotten odour

Solution: turn pile, add dry materials such as leaves, wood chips or straw.

Concern: ammonia odour

Solution: add brown (carbon) materials such as leaves or straw.

Concern: pests (rats, flies)

Solution: remove any meat or fatty foods from pile, or cover with a layer of soil, leaves, or sawdust.

Worms eat your rubbish

How to make worm compost

Key Concept: Earthworms are very useful in aerating and fertilising the soil.

MATERIALS



- 500g kitchen scraps
- Square plastic bin or wooden box
- Worksheet "How to make a Worm Bin"
- Small pile of earth from the garden
- 0.5kg of ready-rotted compost or fruit and vegetables
- Newspapers torn into strips
- Eggshells

Background Information

Food scraps can easily be turned into useful compost with the help of earthworms. Earthworms feed on organic materials. Their castings (faeces) are a rich fertiliser for gardens and houseplants.

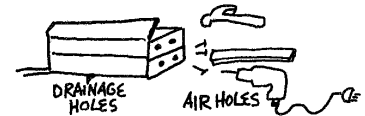
The worm composting system is designed for composting food scraps using earth worms. Food scraps and worms are "bedded" in shredded and moistened newspaper. The worms turn both food scraps and bedding into a high quality compost for house plant and garden use.

Earthworms belong to a large and important groups of worms called annelids. They are also referred to as segmented worms because their bodies are divided into many rings or segments called somites.

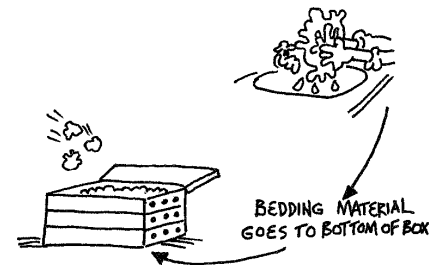
Earthworms are hermaphrodite, meaning that each animal is both male and female and can produce both eggs and sperm. Two worms mate to produce eggs. The eggs will hatch in 14-21 days.

How to make a worm bin

- 1 Build or obtain a rectangular or square shaped wood or plastic bin. Drill holes in 2 sides and on the bottom. Use a piece of wood or plastic sheet to cover the bin.



- 2 Moisten the newspaper with water.



- 3 Sprinkle in 1 or 2 eggshells. (Crush the eggshells otherwise they take too long to break down).

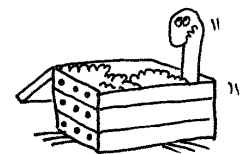
- 4 Place worms in the box.



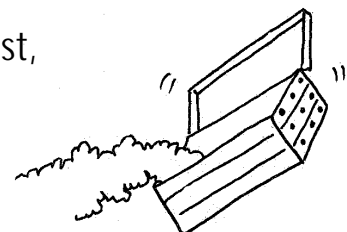
- 5 Bury about 250-500 grams of food scraps once a week. (Make sure to rotate the placement of the food).



- 6 The worm bedding should be changed every 3-6 months. Remove newly made compost and replace with newspaper strips.



- 7 When you're finished worm composting, tip the compost, worms and any newspaper scraps onto a garden.



Other activities

Interview

Telephone / teleconference / E mail waste 'experts' to find out about their job and the issues they work with e.g.

Auckland Regional Council *

Auckland City Council

Landfill

Transfer stations

Business Groups involved in recycling etc.

*You could invite the ARC Waste Education Officer to talk to your school about Reduce, Reuse, Recycle Phone 366 2000 Ext. 7100.

Create

- A cartoon character or cartoon strip about waste issues and publish in school newsletter / local newspaper / school noticeboard
- A waste crossword
- A quiz
- A fact file about waste and waste issues (collect articles from the Internet, newspapers, and magazines)
- Collages, models, sculptures using 'junk' material and have an Art Exhibition!
- Posters
- Fridge magnets
- Bookmarks
- A neighbourhood display
- A video about waste issues at school / home
- A board game...

REMEMBER 

to include strong messages about the three R's (Reduce, Reuse, Recycle) when you are creating!

Perform

- A role play
- A puppet play
- A mime

Write

- A play
- A poem
- Factsheets
- Catchy sayings or slogans e.g. "Save paper. Save trees. Save animals. Save us".
- A rap or song
- Hot tips for the three R's - 'What's hot and what's not'
- Letters to the newspaper

**Make**

- Usable items from 'junk'
- Paper - design and produce stationery, Thank you cards, Christmas cards and wrapping paper
- Something beautiful from 'junk' that makes a sound and moves!
- Ice block stick creations