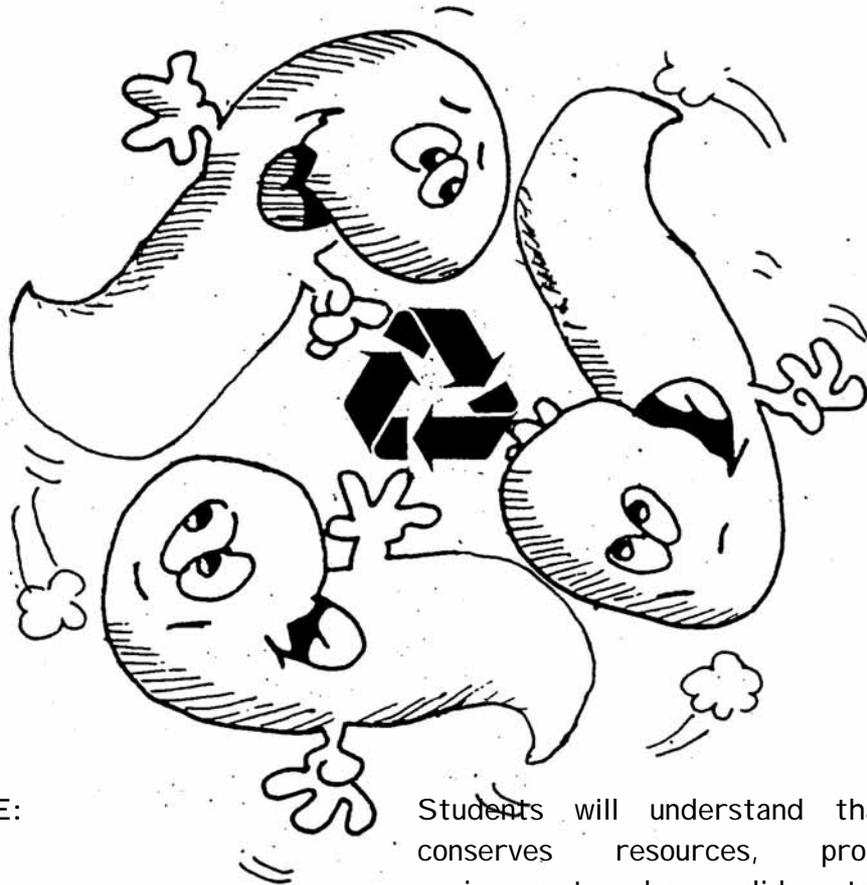


RECYCLE

What is the Recycling Process?

Why is it Important?



OBJECTIVE:

Students will understand that recycling conserves resources, protects the environment, reduces solid waste for disposal and conserves energy.

BACKGROUND INFORMATION:

Recycling is the process of recovering materials used in industry or in the community for further uses. Recycling is one of the 3 R's of solid waste management : reduce, reuse and recycle. Recycling should be carried out when there is no further use for the item. It occurs when a product goes back into the original production process. The result is goods or items made from recycled wastes being purchased.

From a global perspective, the recycling and reuse of raw materials that are in limited supply is essential if society is to sustain its present standard of living. According to research, if the developed world continues to consume mineral resources at its present rate, the world's stocks of copper, cobalt, molybdenum, nickel, platinum and petroleum will be near exhaustion by the Year 2030.

New Zealand has no economic ore deposits or vital minerals such as copper, tin and aluminium. If the supply of these was cut off for any length of time, it would create many problems for the country. Recycling of these and other non-renewable resources would increase our security against outside disruption of our economy and society.

Also recycling saves overseas funds by reducing the need for imports.

Recycling of most materials can lead to major savings in energy. Production of aluminium for example, consumes between 90% and 95% less energy when it uses recycled aluminium cans than when it smelts "new" ones. In a world where most energy for manufacturing comes from the burning of fossil fuels which contribute to "the greenhouse effect", this is something we can well do without. In New Zealand, of course, most of our electricity is renewable, non-polluting hydro power. However, we still get about a quarter of our electricity from burning fossil fuels.

Almost invariably the production of new materials, whether it is by mining minerals, pulping trees or processing oil into plastic generates more pollution than recycling those materials.

Finally, when we recycle goods, they are used productively and do not enter the waste stream. We ease the impact and cost of waste disposal and fast-filling landfill sites.



The strategy recognises that moving *towards zero waste and a sustainable New Zealand* is a long-term challenge.

It has three core goals:

- ▶▶ Lowering the social costs and risks of waste
- ▶▶ Reducing the damage to the environment from waste generation and disposal
- ▶▶ Increasing economic benefit by more efficient use of materials

There has been recycling in Gisborne for many years. Since 2000 city residents have been able to put their recyclables in a bin at the gate for weekly collection. The other system, still in place, is Drop-off depots at central locations.

The most important aspect of the recycling cycle is that it begins with **EACH OF US!** After we consume something, we have a choice of whether to send it to the landfill or separate it out so it can be collected, sorted, processed and made into a new product for use again. We complete the cycle when we purchase items made from or packaged in recycled materials.

While some of the organisations that are involved in recycling are non-profit charities, the main collectors are businesses which operate to make a profit (albeit a small one). Some people are opposed to money being made from their waste. The simple fact is that recycling can reduce disposal costs and **save money for residents and ratepayers**. In addition recycling can **provide jobs for New Zealanders**, while **saving overseas funds, local resources and energy consumption**. There are many misconceptions about the quality of recycled products. For example, recycled (re-refined) oil is considered by many people to be inferior to virgin oil. This is not true as it is refined to the same international specifications by BP Oil NZ Ltd Lubricants Centre in Auckland.

Glass: Glass is unique in that it is 100% recyclable such that one bottle makes one bottle.

New Zealanders are recycling about 45% (2001) of the glass products manufactured each year, but the capacity exists to recycle all of it.

Making bottles from recycled glass, known as cullet, saves approximately 20% of the energy required in the manufacturing process. This is because the cullet melts at a lower temperature than the raw materials used for new glass. The raw materials saved by recycling bottles and jars are:

Sand 72% sourced from Paengarenga Harbour, Northland.
Limestone 12% from Te Kuiti.
Soda Ash 14% imported from Australia.

Glass needs to be sorted by colour and with no contaminants. Typical contamination is from window glass, mirror glass, crystal glass, ceramics, crockery, ovenware and lightbulbs. Paper labels and Metals, such as neck rings and bottle tops, also have to be removed before recycling.

Metal: Nine percent of everything we throw away is METAL. Metal recycling makes economic and environmental sense as pure metals and many alloys need far less energy to recycle than to mine, extract and smelt. The two most common metals found in household waste are aluminium and steel.

Aluminium is one of the most abundant metals in nature. Made from bauxite, aluminium accounts for 8% of the earth's crust. From one tonne of bauxite 500kgs of aluminium and 500kgs of waste are produced. Large amounts of energy are needed to produce primary aluminium from bauxite. Once aluminium is in metal form it can be re-melted over and over again with very little metal loss in the process. Recycling aluminium cans uses a mere 5% of the energy needed to produce new aluminium. Aluminium is used extensively in beverage containers, roofing, window and door frames, boats, aeroplanes and kitchen equipment. Of all packages, aluminium cans are probably the simplest and most efficient to recycle.

Out of a domestic use of 4525 tonnes (2001) 2945 tonnes, 70%, were recovered. Of that tonnage 80% was bailed up for export overseas

Steel cans, commonly known as tin cans, are made of steel and coated with a thin layer of tin. The tin layer stops the steel can from corroding. The steel can has been used for many years in New Zealand both as a food and beverage container. Once washed thoroughly steel cans can be recycled at some recycling centres and scrap metal dealers, but this facility is not currently available in Gisborne.

Scrap metal recycling is another economically viable activity. Steel and iron are reclaimed from cars, railway lines, appliances and building materials. Brass is recovered from household fittings and aluminium cases. Copper taken from electrical wiring, radiators and car batteries is recycled for lead.

Plastics: Plastics come in more than 60 synthetic versions with more being developed constantly.

Crude oil and natural gas are the raw material of plastics. Because of this, the financial viability of recycling plastics varies with fluctuations in international oil prices.

Plastics are an inert material that does not breakdown in landfill. Until large scale plastic recycling programmes are available in New Zealand, we can reduce the amount of plastic waste we create by buying groceries in bulk, avoiding single use plastic containers, using less plastic wrap, taking cloth bags to the supermarket and by encouraging manufacturers to produce more reusable plastic packaging. Reusing plastic packaging, i.e. bread bags, supermarket bags and plastic bottles can also reduce the amount of plastic that is discarded.

Each year the average New Zealander throws away nearly 15kgs of plastic packaging. Plastics make up 11% of the household rubbish in Gisborne City. Burning of plastics in household incinerators is not permitted as plastic releases gaseous pollutants when combusted.

Plastic is one of the most difficult materials to recycle because there are so many different types of it. When two or more types are blended together, the result is a low-grade plastic that can only be used for products such as flower pots, clothes pegs and fence posts.

The secondary products are not recyclable. The plastics industry has a coding system for recyclable plastics. Plastics which can be recycled have a number inside a recycling symbol stamped on them. Two litre milk bottles are coded under this system, as are containers used for food, detergents, shampoos etc. Numbers 1 and 2 are readily recyclable. When plastic waste is recycled, the new product is almost always inferior to the original, due to contamination from product residues and other types of plastic.

Most plastics can be recycled only two or three times, unlike glass, paper and aluminium, which can go through recycling again and again.

Paper: We use and throw away enormous amounts of paper every day!

Over a quarter of the rubbish from Gisborne's households is paper. From offices and schools it would be a lot more.

Much of the paper we use can be reused or recycled, saving energy, natural resources and landfill space. For each tonne of paper we recycle, we save 17 adult trees and use 30 to 55% less energy than making paper from raw materials. New Zealand recycled 164,000 tonnes of paper in 2001.

PAPER is made from the pulped, pressed and dried out fibres of wood. In New Zealand pulp trees are a renewable resource; from planting to maturity our pulp tree takes 20 years to grow. Most waste paper recycled in New Zealand is used to make paperboard. Small quantities are used in making printing and writing paper, tissues, toilet paper and other minor applications such as plasterboard backing.

Oil: Thousands of gallons of used engine oil is drained from cars and disposed of each year. This oil is often dumped into storm drains, on land or in rubbish bins rather than being recycled. As well as this pollution, there is a large pollution potential in the shipped and piped crude oil to New Zealand for refining. New Zealand uses around 60 million litres of oil a year, but less than half is recycled.

Class Plan (Levels 1 and 2)

1. Sort the classroom waste. Discuss what can be recycled. What recycling is.
2. Label boxes at the front of the classroom and have the children sort the waste into categories such as paper waste, metal, glass and plastic. They should manipulate it as much as possible to feel the different textures and shapes.
3. If some of the recycling categories are not present in the bin (e.g. glass, plastic, oil) have some of those present to show the children.
4. Sort the materials into the correct boxes.

Materials:

- ▶▶ Classroom waste (include metals, glass, paper, plastic, clothing, fruit waste).
- ▶▶ Eight boxes to sort into.
- ▶▶ Worksheets "Reuse and Recycle" and "Recycling Bins".
- ▶▶ Felts / crayons, scissors, glue.

Class Plan (Levels 3 and 4)

1. Sorting Plan

This can be done in two ways - either:

- ◆ Have each child bring in one or two examples of waste from his or her home. (Ask children to be sure the waste has been cleaned as much as possible before bringing it in.) You may wish to bring in some examples, as well. The collection should include plastic, paper, cardboard, different types of cans and glass. Label boxes at the front of the classroom and have the children sort the waste into categories such as paper waste, metal, glass and plastic. They should manipulate it as much as possible to feel the different textures and shapes.

OR

- ◆ Using photocopies of the two worksheets, "Reuse and Recycle" and "Recycling Bins", ask the children to colour the recyclables, cut and paste into the correct recycling bin.
- ◆ From the background notes and the overhead transparency "diverting the Waste Stream" discuss recycling and the issues involved.

2. Draw a Flowchart

- ◆ Draw, annotate and illustrate a flowchart to show the processes involved in the manufacture, use, distribution, collection, recycling and consequent stages in the life of a can, glass bottle, plastic container, newspaper, etc. This can be done individually or in groups. Reference to where each stage takes place in the local community or where materials come from or go to in the district can be added at the end of the next lesson.
- ◆ Get the children to present their findings to the class.

OR

- ◆ Hold a debate. Select a controversial topic which will stimulate a discussion of views e.g. *"We don't need to recycle - who cares about the rest of the world? It's not our problem!"* Split the class into two groups - for and against. Give the children time to discuss the issue amongst themselves before listing the points they want to make and to select speakers for their group. An extension activity could be a letter to the editor of a local newspaper, a journalist's report of the debate or an article for the school magazine or newsletter.

Materials:

- ▶▶ Two pieces of waste brought by each student.
- ▶▶ Eight boxes for sorting.

OR;

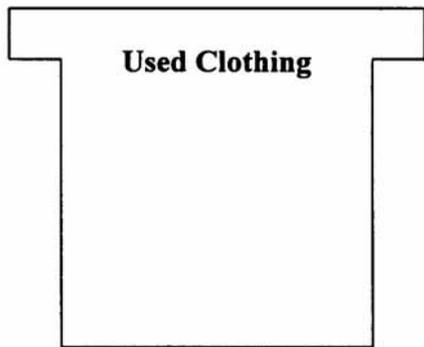
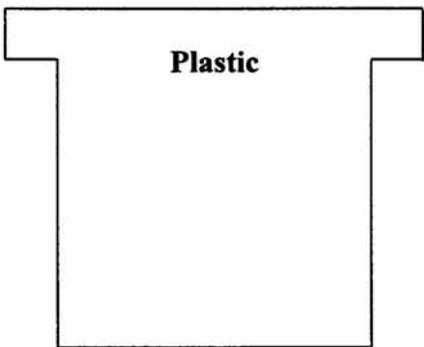
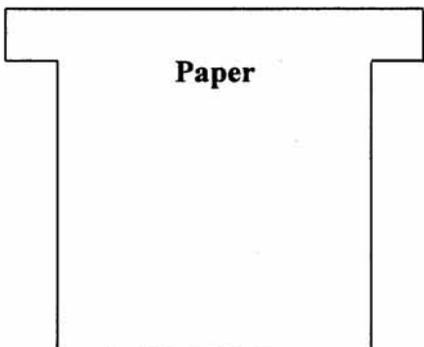
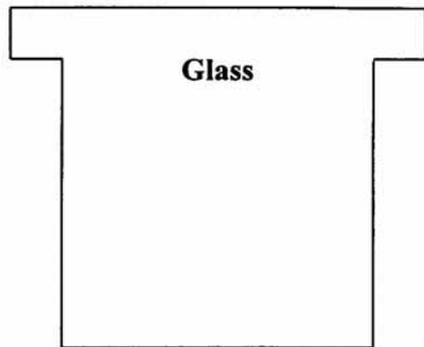
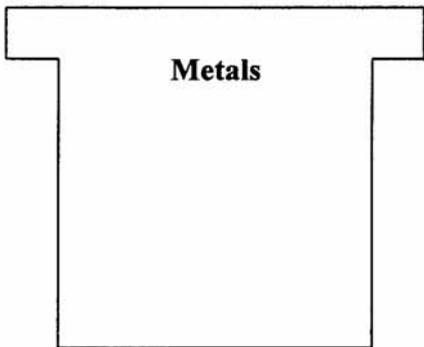
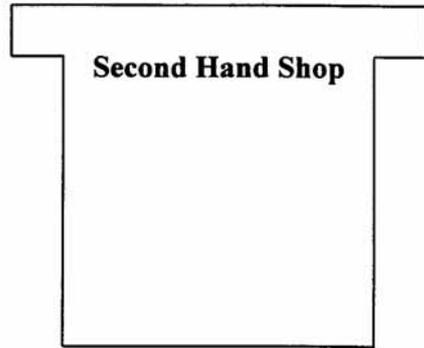
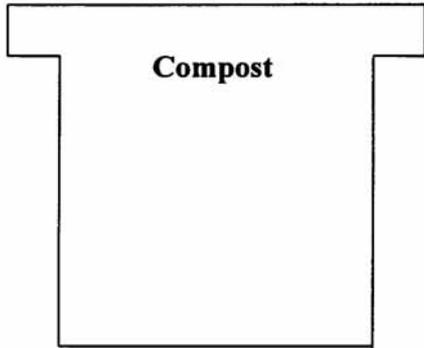
- ▶▶ Photocopies of "Reuse and Recycle" and "Recycling Bins".
- ▶▶ "Diverting the Waste Stream".
- ▶▶ Large sheets of paper, felts or crayons.

REUSE and RECYCLE

(Sorting Exercise)

Colour the recyclables on this page. Then paste them into recycling bins or the repair shop and second-hand shop (on the other page).





ADDITIONAL MATERIAL

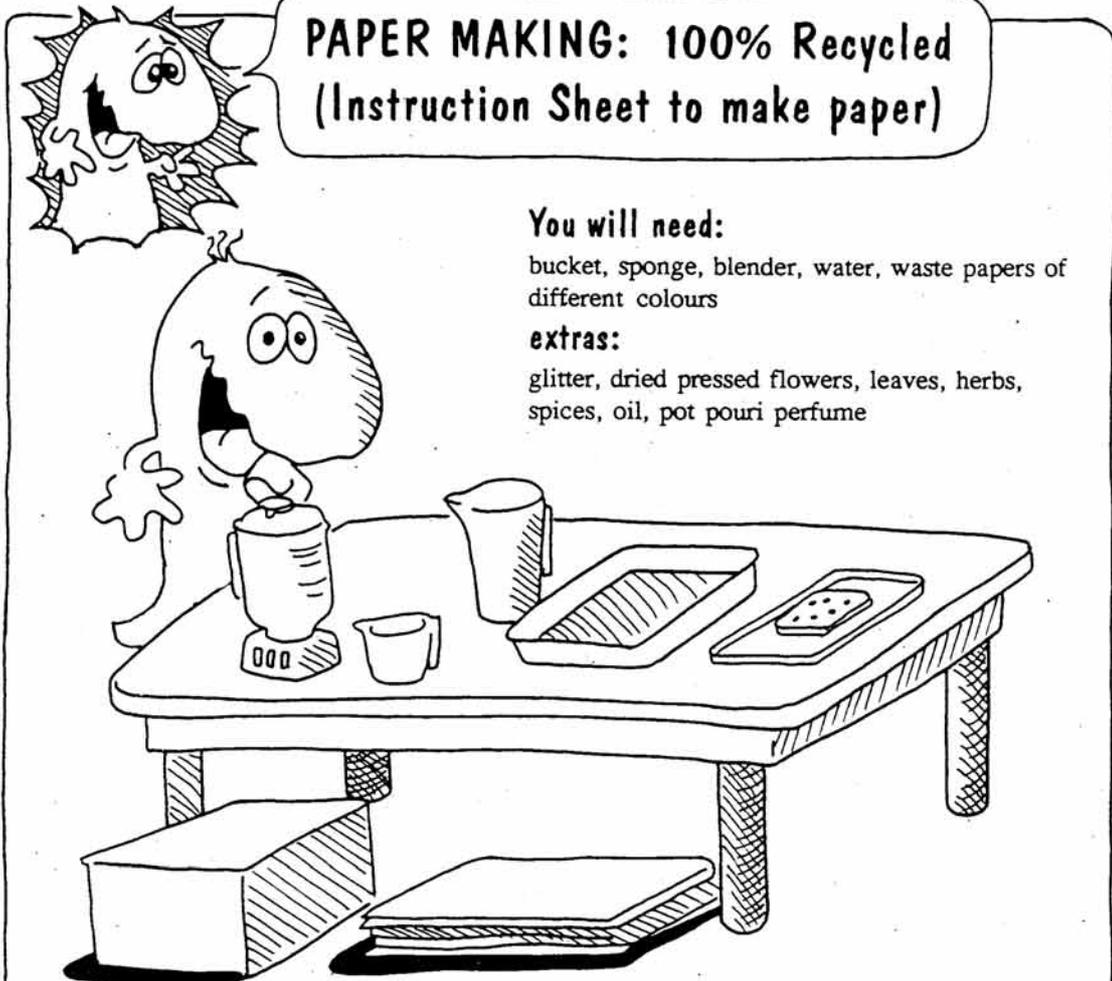
PAPER MAKING: 100% Recycled (Instruction Sheet to make paper)

You will need:

bucket, sponge, blender, water, waste papers of different colours

extras:

glitter, dried pressed flowers, leaves, herbs, spices, oil, pot pouri perfume



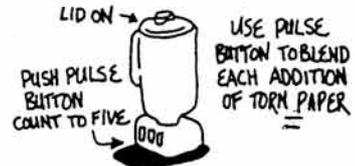
① FILL BLENDER



② SHRED PAPER INTO 4 CUP CONTAINER



③ ADD SHREDED PAPER TO BLENDER BY SMALL HANDFULS



⑤ POUR PAPER PULP INTO SCREEN TUB



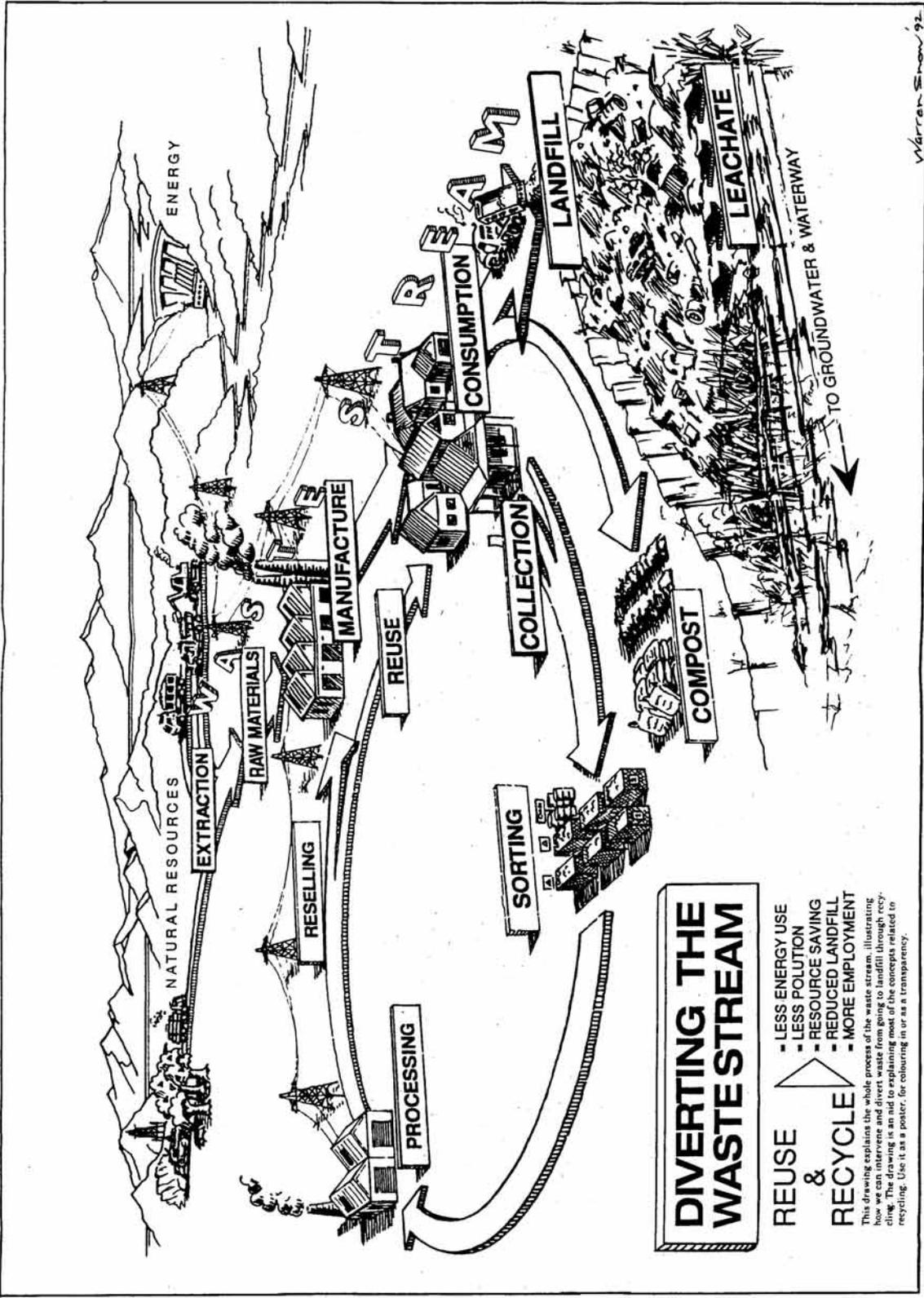
⑥ SWIRL WATER TO SUSPEND PAPER PULP THEN LIFT SCREEN STRAIGHT UP AND OUT OF WATER

⑦ GENTLY SPONGE THE PAPER PULP ON SCREEN TO REMOVE EXCESS WATER

⑧ CAREFULLY LIFT AT CORNER: LIFT PAPER OFF SCREEN AND PLACE ON NEWSPRINT TO DRY

⑨ EXTRAS CAN BE ADDED AT STEP 2 OR STEP 5

NB:— A BUCKET AND AN EGGBEATER OR WHISK CAN BE USED INSTEAD OF A BLENDER.



DIVERTING THE WASTE STREAM

- REUSE & RECYCLE**
- LESS ENERGY USE
 - LESS POLLUTION
 - RESOURCE SAVING
 - REDUCED LANDFILL
 - MORE EMPLOYMENT

This drawing explains the whole process of the waste stream, illustrating how we can intervene and divert waste from going to landfill through recycling. The drawing is an aid to explaining most of the concepts related to recycling. Use it as a poster, for colouring in or as a transparency.

Warren Show 92

RECYCLE

How to Recycle - Where to Recycle



OBJECTIVES:

Students will understand the common types of recyclables, why it is important to wash and clean the containers, how to properly sort them, and where to take them.

Students will initiate home recycling by constructing a take home recycling kit. They will be able to explain to their families the why, what and how's of sorting recyclables.

Students will also understand why it is essential to sort recyclables.

BACKGROUND INFORMATION: Recycling is one of the primary ways of diverting waste from landfills. Recycling means to use a material over and over again.

Each resident in New Zealand produces the equivalent of 2.5kg of waste each day. More than 50 percent of what we waste is reusable or recyclable.

The loss of natural resources and energy and rubbish tipping costs, both environmental and economic, make recycling an important waste alternative.

Recycling is simple and easy. Preparing a recycling area at home can help make recycling fun and efficient.

The first step to recycling is deciding not to put the recyclables in the rubbish bin.

Unless the recyclable material is properly sorted it remains rubbish. It is more cost effective for households to pre-sort recyclables than machines and personnel in recycling centres.

CATEGORIES

Compost

Organic material such as dry leaves, untreated sawdust, woodshavings or ash, peat, some paper, egg shells, dust, vegetable and fruit scraps, tea leaves, coffee grounds, lawn and hedge clippings, hair/fur, seaweed, some weeds, animal manure.

Glass

Glass must be recycled in separate colours - clear, brown, green. Window glass, mirror glass, crystal glass and light bulbs are not recyclable. Wash and remove tops.

Aluminium Cans

Separate aluminium and steel cans.

Characteristics of Metal Cans - (telling the difference for recycling)

Aluminium: Is not attracted by a magnet.

It has no seam.

If the bottom of the can is round and more shiny, then it is aluminium.

Aluminium cans are used mainly in New Zealand to package drinks.

Steel: Is attracted by a magnet.

Bottom as a rim.

If you look closely, the bottom is not finely brushed.

Cardboard / Paper

Clean and dry newspapers, cardboard (flattened), magazines, office paper, newsprint, photocopying paper.

Wax or plastic coated paper / cardboard (e.g. milk containers) cannot be recycled. These should be reused where possible, although small quantities are allowed in a mixed paper grade.

Plastic

Most plastic containers and bags have a number code on the bottom. This code (a triangle surrounding a number) identifies the plastic type. For example plastic milk bottles are a #2.

There is a ready market for # 1 and 2. In both cases they should be rinsed and caps removed.

Here are examples of the seven plastic identification codes:

1. PET (Poly-Ethylene Terephthalate)
Clear plastic such as used for soft drink and some fruit juice bottles.
2. HDPE (High Density Polyethylene)
Matt finish plastic, such as in milk bottles, household cleaning products, shampoo bottles, ice-cream containers, supermarket bags.
3. PVC (Polyvinyl Chloride)
Not widely used in household packaging - used in spouting and downpipes.
4. LDPE (Low Density Polyethylene)
Mainly plastic bags such as used for bread and drycleaning.
5. PP (Polypropylene)
Mainly used in jar and bottle tops.
6. Non Expanded Styrene
Yoghurt and cottage cheese tubs.
Polystyrene (expanded styrene)

Used in meat trays, bean bag filling and protective packaging for electrical appliances.

7. Other

This category includes ABS styrene used for butter and margarine containers plus all other resins and layered multi-material.

Scrap Metal

Most scrap metals, including car bodies, old washing machines, broken kitchen appliances, piping etc.

Oil

Waste oil is taken back by some garages and recycling centres.

Car Batteries

Auto electrical companies and some service stations will accept used batteries.

Used Clothing

Red Cross, Salvation Army, Church and School groups. Also bins for rag collection.

Car Tyres

Most tyre companies and service stations will accept used tyres.

Building Materials

Building recyclers give money for most building materials. Small off-cuts are often welcomed by Playcentres / Kindergartens etc.

Kindergartens / Playcentres / Day Care Centres will often take used containers (boxes, yoghurt, egg cartons etc), magazines, cards. Enquire locally.

Use garage sales, opportunity shops, second-hand shops and building recyclers.

RECYCLING IN GISBORNE

❖ Kerbside Recycling

Weekly collection from the gate of all houses in Gisborne City, the townships of TeKaraka, Patutahi, Manutuke, and routes to these townships.

Recycling bins are provided.

Collection of all clean household packaging from the following categories: steel and aluminium cans and tins, plastic (especially plastic bottles), glass bottles and jars.

All clean paper and cardboard (includes newspapers, junk mail, magazines, envelopes, all cardboard packaging, paper with crayon, paint, staples or sellotape is acceptable).

❖ All Brite Industries

Situated at 69 Innes Street West. The depot is open all the time for:

All clean paper and cardboard

Plastic bottles

Steel cans

Aluminium cans

Glass bottles and jars

❖ Woolworths Superstore Carpark

Aluminium cans - if you want money for your cans Pakeke Lions operate a "Cash for Cans" depot from 9.30am to 11.30am every Saturday.

❖ Rural Depots

Rural Recycling Depots are at all rural townships with Transfer Stations:

Te Araroa, Waiapu Landfill, Te Puia, Tokomaru Bay, Tolaga Bay, Te Karaka, Whatatutu, Matawai.

They collect all paper and cardboard, plastic bottles, glass bottles and jars, metal cans.

❖ Also: Gisborne Bottle Scrap Metal Recyclers, Grey Street just beachside of Waikanae Creek behind Scragg Motors. Open 8.30am - 5.00pm weekdays for scrap metal, glass, bottles and batteries.

❖ Schools

Some schools operate selective recycling by their pupils, e.g. cans, paper, plastic or for their local community.

Class Plan (Levels 1 and 2)

1. Invite someone from the Environmental Section of Gisborne District Council (telephone 867 2049) or an expert from the Recycling Centre to come and talk to you about recycling (they could bring examples of each category of recyclables and examples of products they have been made into).
2. Make a pamphlet to present at home on Home Recycling. Help with the day to day running of this.
3. A special certificate can be given to those students who have successfully started recycling at home or help with recycling (who help with taking scraps to the compost heap, recyclables to the garage etc).



Materials:

- »» Visitor
- »» Card, felts, scissors, hole punch, wool.
- »» Certificate.

Class Plan (Levels 3 and 4)

1. Students discuss sorting and separating recyclables. What materials are recyclable? How do we prepare glass, paper, aluminium, tin, plastic and other items for recycling?
2. **Pamphlet Construction**
 - ❖ Glue different coloured sheets of paper or white A4 sheets onto the cardboard.

- ❖ Have students label the top of each piece of construction paper with the following headings - glass, paper, aluminium, steel, plastic and other recyclables.
- ❖ Using the "Background" information, transfer the material on to each card for each recyclable item; *OR*
 - Draw pictures, magazines, cut out pictures of the different categories of waste. Paste these pictures below the label and above the directions on the corresponding card to form collages. In making the aluminium card, use aluminium foil brought from home. Get the students to label the last sheet "Other Recyclables".
- ❖ Have students punch two holes on the right hand side of the "recycle" sheet, two holes on both sides of the "paper", "glass" and "plastics" sheets and two holes on the left side of "other recyclables" sheet. Connect the sheets with ribbon or wire.
- ❖ Students make up bin labels for each of the categories of recyclables - to be used at home.
- ❖ Students discuss setting up a recycling centre in their homes.
- ❖ Each student draws a floor plan of his or her house, marking places where the home recycling centre could be set up. Paste this plan on the back side of the recycle sheet.
- ❖ Public information is necessary for recycling to be successful. Students practice presenting the pamphlet to fellow classmates, their own families and the community.
- ❖ A special certificate can be given to those students who have successfully started recycling at home.
- ❖ Students make a monthly report of home recycling centre.



3. Set up recycling containers in the classroom. Discuss and set up recycling at your school.

Include paper, aluminium cans, compost.

Materials:

- » Recycled cardboard
- » Paper
- » Glue
- » Magazines (optional)
- » Aluminium foil
- » Hole punch
- » Recycled wool, ribbon or wire

How to Start a School Recycling Programme

Recycling at school is a great way to reduce waste, help our environment and educate our young people on the importance of waste minimisation. Here are some suggestions for starting a recycling programme at school.

1. Organise a recycling committee to make the programme a success. Involve your friends, students from other classes and some interested teachers and parents.
2. Organise a meeting to decide:
 - ❖ What you will call the group.
 - ❖ What you will recycle (see "RECYCLING").
 - ❖ How you will collect things for recycling.
 - ❖ Where you will place your recycling bins.
3. Contact recycling companies (see "RECYCLING" list of contacts) to set up containers and a collection scheme.
4. Promote your recycling scheme. Create fun and colourful posters and flyers telling students, teachers and administration staff where, what and how to recycle. Put notices in your school newsletter for parents to encourage their involvement in the programme.
5. Contact your local newspaper to see about advertising your programme.
5. Start recycling!
6. Keep students, teachers and parents involved. Tell them how the programme is going. Ask your recycling companies how much glass, aluminium, paper and plastic your school is recycling.
7. Hold regular meetings. To keep everyone interested in recycling, you have to make it fun. Try to organise special events at school - like environment days, recycling teams excursions. Other ideas include planting trees, organising a school composting programme, and guest speakers

ADDITIONAL MATERIAL

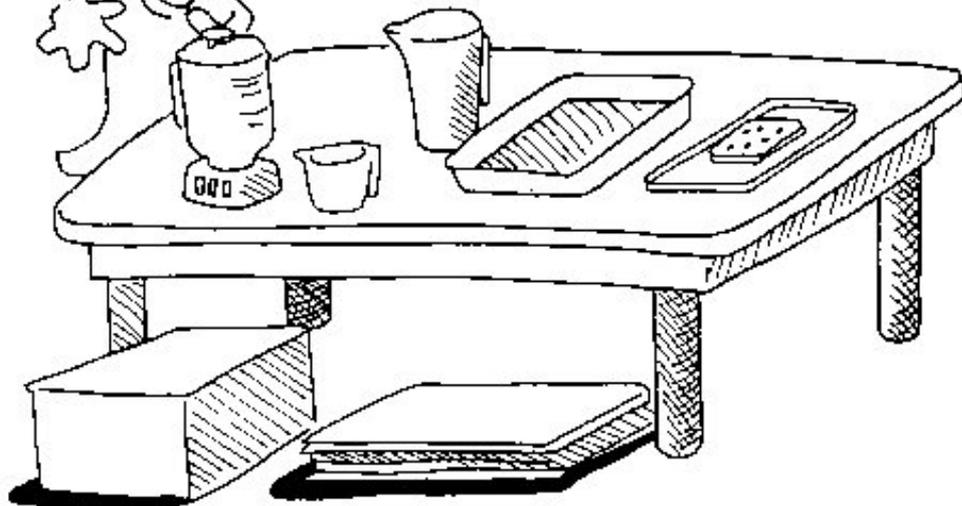
PAPER MAKING: 100% Recycled (Instruction Sheet to make paper)

You will need:

bucket, sponge, blender, water, waste papers of different colours

extras:

glitter, dried pressed flowers, leaves, herbs, spices, oil, pot pouri perfume



① FILL BLENDER



② SHRED PAPER INTO 4 CUP CONTAINER



③ ADD SHREDDED PAPER TO BLENDER BY SMALL HANDFULS



④ STOP WHEN PAPER PULP IS LIKE THICK GRAVY



⑤ POUR PAPER PULP INTO SCREEN TUB



⑥ SWIRL WATER TO SUSPEND PAPER PULP THEN LIFT SCREEN STRAIGHT UP AND OUT OF WATER

⑦ GENTLY SPONGE THE PAPER PULP ON SCREEN TO REMOVE EXCESS WATER

⑧ CAREFULLY LIFT AT CORNER: LIFT PAPER OFF SCREEN AND PLACE ON NEWSPRINT TO DRY

⑨ EXTRAS CAN BE ADDED AT STEP 2 OR STEP 5

NB:— A BUCKET AND AN EGGBEATER OR WHISK CAN BE USED INSTEAD OF A BLENDER



Willys Recycle

Certificate



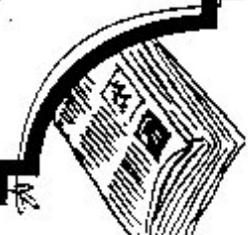
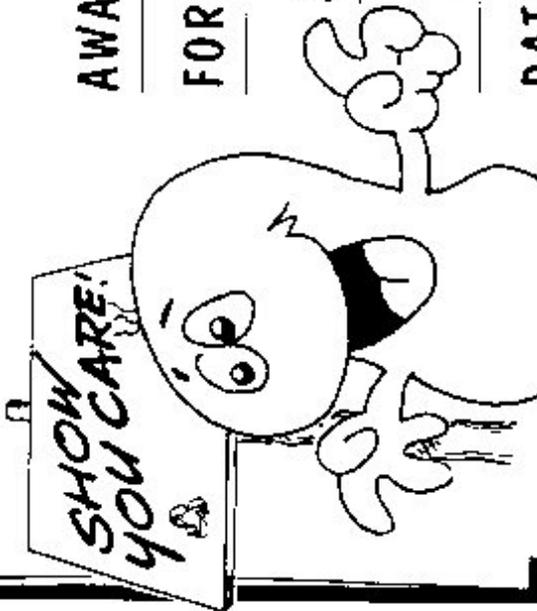
AWARDED TO.....

FOR....

SCHOOL....

TEACHER....

DATE.....



WORD SCRAMBLE

All of the scrambled words have something to do with recycling.

DIRECTIONS

Use the definitions to help you figure out each of the words, and then rewrite it as shown. The first one has been done for you.

1.	YEERCCL RECYCLE	The collection and processing of materials for reuse in the same form or in a different form.
2.	NFLLADIL	A place set aside for the disposal of rubbish by compacting and burying it.
3.	ITERLT	Rubbish materials carelessly thrown away on the roadside, in the woods and on the beach etc.
4.	SOMPCTO	A collection of plant materials, such as leaves, grass clippings, kitchen scraps etc which are layered and turned over forming a rich organic soil.
5.	RATUNLA CROESSREU	Valuable materials found on the earth such as wood, water, metals, minerals, gas and oil (2 words).
6.	TAREAIOPSIN	The sorting out of recyclable materials at home before they are taken away.
7.	GAPAINKCG	The wrapping or sealing used on a bought item, often designed to attract the buyer.
8.	SEEUR	Extend the life of an item by repairing it, changing it or making it into something new.
9.	PSEMOEDCO	To break down and change form back into organic matter such as when leaves turn back into soil.
10.	NREINEMVOTN	The community of living things both plants and animals, and all the physical and chemical conditions with which they interact.
