Making Waste Wonderful

Glass

A learners guide

Helping schools and communities reduce waste

Ministry for the Environment
Manatū Mō Te Taiao
Sustainable Management Fund

Glass information

The Egyptians first made glass around 3000 BC. The process used today is still very similar but has become much more sophisticated and very technical.

There are four main ingredients used to manufacture glass:

1. Silica sand,
2. Soda ash,
3. Limestone
4. Recycled glass (cullet).

Small quantities of other materials give glass its colour.

The Process

- All the materials are first weighed then mixed, and then poured into large furnaces. The temperature in the furnace ranges from about 1100 – 1590 degrees Celsius. This melts all the ingredients into Molten (liquid) glass. Computers monitor the whole process.
- From the furnace, the Molten glass goes to a bottle-making machine. A measure of molten glass (this is called a ***GOB)*** is delivered to the machine to make a bottle or jar.
- The bottles then pass through electronic inspection machines, which automatically detect faults Rejected damaged bottles, are returned to the raw materials area and recycled for making new glass.
- The bottles are then packed onto pallets. Each pallet can contain as many as 5000 bottles. The pallet is then covered in a large plastic envelope that has been shrunk until tight. This makes sure the pallet is stable, ready for transportation to the manufactures for filling.

Directions: Read the information above and write some short sentences about making glass. Each sentence should use one of the words below.

Bonus Activity: Draw some pictures to illustrate some of your sentences.

Select one word from below for each sentence. Make a short sentence to include the word

1. Ingredients
2.Temperature
3. Rejected
4. Egyptians
5. Gob
6. Pallets
7. Furnace
8. Recycling
9. Cullet

Sentences

1. _____

_____

2. _____

_____

3. _____

_____

4. _____

_____

5. _____

_____

6 _____

. _____

7 _____

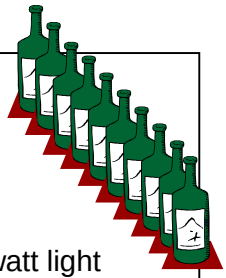
. _____

8 _____

. _____

9 _____

_____



Glass Information

Facts

- Glass is mostly made from heating and moulding sand
- The energy saved from recycling one glass bottle will light a 100-watt light bulb for four hours.
- Adding old glass to batches of new glass reduces the energy requirement by 25%. as the old glass melts quickly so less energy is needed.
- Glass produced from recycled glass instead of new raw material reduces
  Air pollution by 20%
  Water pollution by 50%
- Glass takes a long time to breakdown in a landfill. It may still be around 1000 years from now. It also take up a great deal of space in the landfill.
- Other products made from recycled glass bottles include insulating materials for walls and roofs, and materials to build roads.
- New Zealanders use 189,005 tonnes of glass a year and recycles 92,825 tonnes, that means about 49% of glass is recycled in N.Z.

Directions: Do some research on the Internet to get some ideas on how to use recycled glass. Ask yourselves are these ideas any good or useful. Could they be used elsewhere by industry or in your community? Record your answers and ideas below.

Bonus Activity: Think how you could reuse recycled glass at your school.

1.Ten, nine eight, glass bottles sitting on a wall if two went POP

My glass recycling idea is:

_____

Can my idea be used?

_____

How can my idea be used?

_____

Who would use my idea?

_____

2.Seven, six, five, glass bottles sitting on a wall if four went POP

My recycling idea is:

_____

Can my idea be used?

_____

How can my idea be used?

_____

Who would use my idea?

_____

How to recycle glass

Each year we throw away thousands of tons of glass that is both reusable and recyclable.

How to Recycle Glass

- Take your glass to your nearest Council's Landfill or Transfer station
- You can recycle bottles of all colours and jam jars.
- Wash all bottles.
- Make sure all the tops are removed.

You cannot recycle

- Window glass
- Mirror glass
- Crystal glass
- Lightbulbs

These all have a very high lead content, which is dangerous to the environment.

What happens to the recycled glass?

Most of the glass collected for recycling on the West Coast is stored and then crushed with a large roller to reduce its volume. It is then used for landfill cover or sometimes as a base for laying drains on instead of using gravel.

Directions: Write a short story for the newspaper or make a poster about the life of a bottle or jar, starting with:

- A bottle or jar on the supermarket shelf that you take home.
- What you decide to do with the bottle or jar once you have emptied the contents. *hint do you reuse it somehow.*
- Finally decide how your story will end.
  will it go to the Landfill/Transfer Station for crushing,
  or into a rubbish bag
  or into the landfill
  or thrown into the bush or river
  or dropped on the pavement.
- Explain why you chose that particular ending

Bonus Activities

1.Make some Musical Bottles

Collect some similar sized jam jars with varying levels of water in them. Blow across the top of each jar and arrange them in order of the pitch (sound) from low to high.

2. Make some posters, logos, slogans etc. to promote glass recycling at school or within you community.