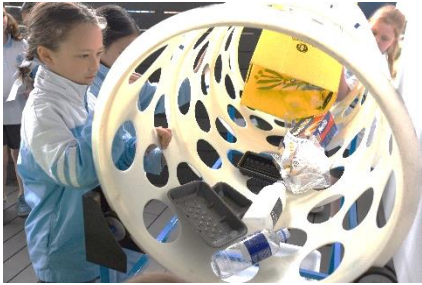


# Big Books Teacher Resource

## Overview

Use this sheet to learn about each part of the Wipe Out Waste journey.

Suggested activities help to solidify ideas for students.



## Materials Recovery Facility (MRF)

(Pronounced *murf/merf*)

Materials Recovery Facilities are where the contents of the yellow lidded co-mingled kerbside recycling bins are taken. At the MRF, there are a series of mechanical and human sorting processes that separate the items into groups of the same material. These materials are then baled and taken to recycling plants to be reprocessed into new materials.

Each MRF is slightly different based on the machinery and technology available but there are some features that are common to many.

**Trommel** - This is a large spinning cylindrical barrel with holes in it. The materials enter the trommel, and as the trommel spins around the three dimensional items (bottles, jars, containers) fall through the holes, whilst the two dimensional items (paper, cardboard) travel through the trommel to the next conveyor. This is the first separation stage.

**Bounce Conveyor** - This is the second sorting phase to further separate the items. A sloped conveyor belt bounces the materials up the conveyor. The heavier items (typically the 3D objects) fall back down the conveyor belt, whilst the lighter items (typically 2D objects) travel up the conveyor.

After these two mechanical stages, the materials travel along a horizontal conveyor belt and the objects are sorted by hand. People working along the conveyor belts focus on sorting particular items into the sections behind the conveyor).

How fast are the conveyors? Fast! It depends on the materials and the size of the loads, as the speed can be adjusted.

This short 4 minute [video segment](#) from Totally Wild shows footage of some of the different sorting processes.

As of 2022, Metropolitan Adelaide MRF's include:

- NAWMA (Northern Adelaide Waste Management Authority)
- CAWRA (Central Adelaide Waste and Recycling Authority)
- SRWRA (Southern Region Waste Resource Authority)

Regional MRFs are located in Mt Gambier, Port Lincoln and Whyalla. Other regional areas may have recycling depots or transfer stations instead of a MRF.

## Teacher Resource Sheet Continued



### Suggested Activities

Soak a fruit box or carton in a bucket of water for a few days. You should be able to see how the plastic will separate from the LPB, like it would at the paper recycling centre. This leaves the LPB which can be recycled to make new products.

Hire a papermaking kit from KESAB *environmental solutions* and make your own recycled paper.

## Container Deposit Legislation (CDL)

South Australia introduced Container Deposit Legislation in the 1970s to increase the rate of recycling and to reduce litter. The deposit is only on 'convenience' items or take-away products because these contribute to the litter problem more than the larger containers (such as plain milk, juice and flavoured milk in containers greater than one litre).

The 10c containers that are put into recycling bins (without claiming the deposit) end up at a MRF. From here, they are sorted and then taken to a 'Super Collector'. All of the containers that are taken to local recycling depots where the deposit is claimed are also taken to the Super Collectors. In South Australia, the Super Collectors are Marine Stores Pty Ltd, and Statewide Recycling and Flagcan Distributors.

For more information, history and fact sheets about CDL, take a look at this [fact sheet](#) from the EPA.

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## The Amazing Journey of your Recyclables Big Book Support Information

The following sections have prompting questions or further information relating to the pages in the individual books, as well as some extra tips for recycling each of these materials, and activities relating to the materials.

### Paper

**Pg 1.** Liquid Paper Board (LPB) is a type of paper/cardboard. It is the material that cartons and fruit boxes are made from (see page 4). It has a very thin layer of plastic on both the inside and outside, but this comes off in the giant washing vat before the paper is recycled. Some cartons have a 10c deposit, but plain milk cartons do not.

**Pg 1.** Why can't the fruit box in this book be recycled as is? What do we need to do to it before it can be recycled? (It needs to have the straw removed. The straw is plastic. Removing straws helps to ensure that cartons are empty. Recycling depots can refuse to take containers that pose an OHS & W risk, which can occur if liquid is spilled).

In South Australia, paper is taken in bales from the MRF to New South Wales or overseas, which will depend on demand and price.

## Teacher Resource Sheet Continued



### Suggested Activities

Use the plastics identification code to identify different plastics inside the classroom and at home.

Can some be recycled more easily at home than school? Why? Why not?

Do the same types of plastics look the same? Why? Or why not?

### Plastic

The triangle with a number inside found on plastics is a Plastics Identification Code (PIC). This number identifies the type of plastic the item is made from. More information about the PIC can be found on the [Which Bin website](#).

It is important to note that not all materials with a PIC can be recycled in your kerbside bin. Kerbside recycling cannot take soft, scrunchable plastic or expanded foam plastic. Some supermarkets offer collections for soft plastic, and you can learn more about this from the [REDcycle website](#). There may be local recycling options for expanded polystyrene, and some suggestions can be found on the [Which Bin website](#).

**Pg 1.** What different types of plastic can you see in the picture? (PET 1, HDPE 2, PVC 3, LDPE 4, PP 5, PS 6, Other 7).

**Pg 2.** Would the plastic containers fall through the holes in the trommel, or move through? (They would fall through, because they are 3D objects.)

Plastic lids can now be recycled if they are put into a large plastic milk bottle and the bottle is filled with lids.

**Pg 3.** Can you see any other materials on the conveyor waiting to be sorted? (steel, aluminium, paper, glass).

**Back cover.** Plastics can be spun into thread and made into clothes or carpet. Outdoor benches and infrastructure can also be made from recycled plastic (see [Replas](#) – Australian made recycled plastic products).

Plastics may be recycled locally, or sent interstate or overseas.

[Advanced Plastics Recycling](#) is an example of a South Australian plastic processing plant.

### Aluminium

**Pg 1.** Aluminium is used for some food and drink cans. 10c cans that are at a MRF would have come from a kerbside recycling bin (which means the monetary deposit has not yet been claimed)

**Pg 4.** 'You might get to drink from me again!' This doesn't mean the same can, but when it has been recycled into a new one. Some aluminium cans are made into new aluminium cans, as well as other products.

**Back cover.** When aluminium is turned into recycled products, it is often mixed with other metals. It is likely that the step ladder, drink can and coffee tin are made from aluminium. The bicycle frame may also be aluminium.



## Teacher Resource Sheet Continued



### Suggested Activity

Use a magnet to identify the difference between steel and aluminium containers. Containers made from steel will attract the magnet, whilst aluminium will not.

Which containers are steel? Which are aluminium? Be careful - this test is not foolproof! Some products are also a mixture of several metals.



### Suggested Activity

Can you think of another way that these non-recyclable glass products could be used? Could you collect these and undertake a project that would divert them from landfill? (eg. mosaics, artworks).

### Steel

**Pg 1.** Lids of the steel cans can be recycled, but they need to be placed inside the can and squashed closed. Aerosol cans can be recycled with the small plastic nozzle left on, but the larger plastic lid should be removed and placed separately in the recycling.

**Pg 4.** Labels can be left on cans as they will come off in the washing or melting processes. Steel is infinitely recyclable. It can be recycled continuously without degrading in quality.

**Back cover.** Like aluminium, steel is often mixed with other metals when it is turned into recycled products. On the back page, the construction girders, biscuit tin, beetroot tin, and pots and pans are likely to be steel. Bicycles can be either steel or aluminium – you can often feel the weight of the bicycle to help decide if the frame is steel or aluminium.

### Glass

**Pg 1.** Glass is made of sand, but there are also other ‘ingredients’ including limestone and soda ash. Soda ash (sodium carbonate) can be made synthetically from limestone and salt. Glass does not degrade when it is recycled, so it can be recycled continuously. Most of the recyclables collected from kerbside bins are paper and card. This provides a cushion for the glass and prevents most breakages when glass is travelling in the truck or being tipped out.

If glass is broken at home, this needs to be disposed of in the landfill bin.

**Pg 3.** Glass is sorted into the different colours to keep recycled glass products the same colour. Some items can’t be recycled because they have different melting points (such as pyrex), and some items (such as mirrors) have other things added.

**Pg 4.** The cullet is taken to glass recyclers where it is melted and remoulded into new glass products.

Learn more, and watch a video about glass recycling, [here](#).