



HAND PRINT™  
action towards  
sustainability

## Recycling, Waste Reduction and Creative Re-use



### **A Share-Net Resource Book**

Reading-to-learn curriculum materials to support  
Social Sciences, Technology, Life Orientation, Arts & Culture,  
Economics & Management Sciences and Language learning areas



# Acknowledgments

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Knowledge and activity support materials have been adapted from various sources including the Internet, and web addresses have been provided for readers to access any copyright materials directly.

For this particular resource book, thanks go to Liz O' Donoghue, a teacher at Kingswood College, whose waste recycling project formed the basis of the narrative. She willingly shared her story and also gave advice on how to best design some of the activities.



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P O Box 394, Howick, 3290, South Africa  
Tel (033) 3303931  
sharenet@wessa.co.za

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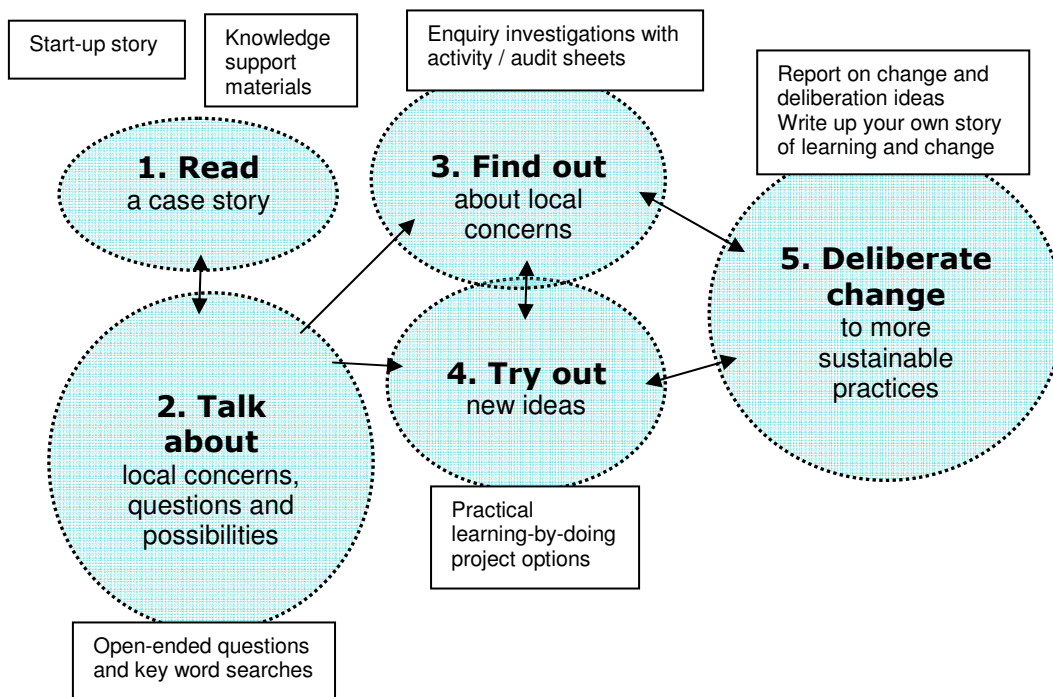
## RESOURCE BOOKS

The **Handprint Resource Books** have been designed for creative educators who are looking for practical ideas to work with in the learning areas of the National Curriculum. The focus is on **sustainability practices** that can be taken up **within the perspective that each learning area** brings to environment and sustainability concerns.

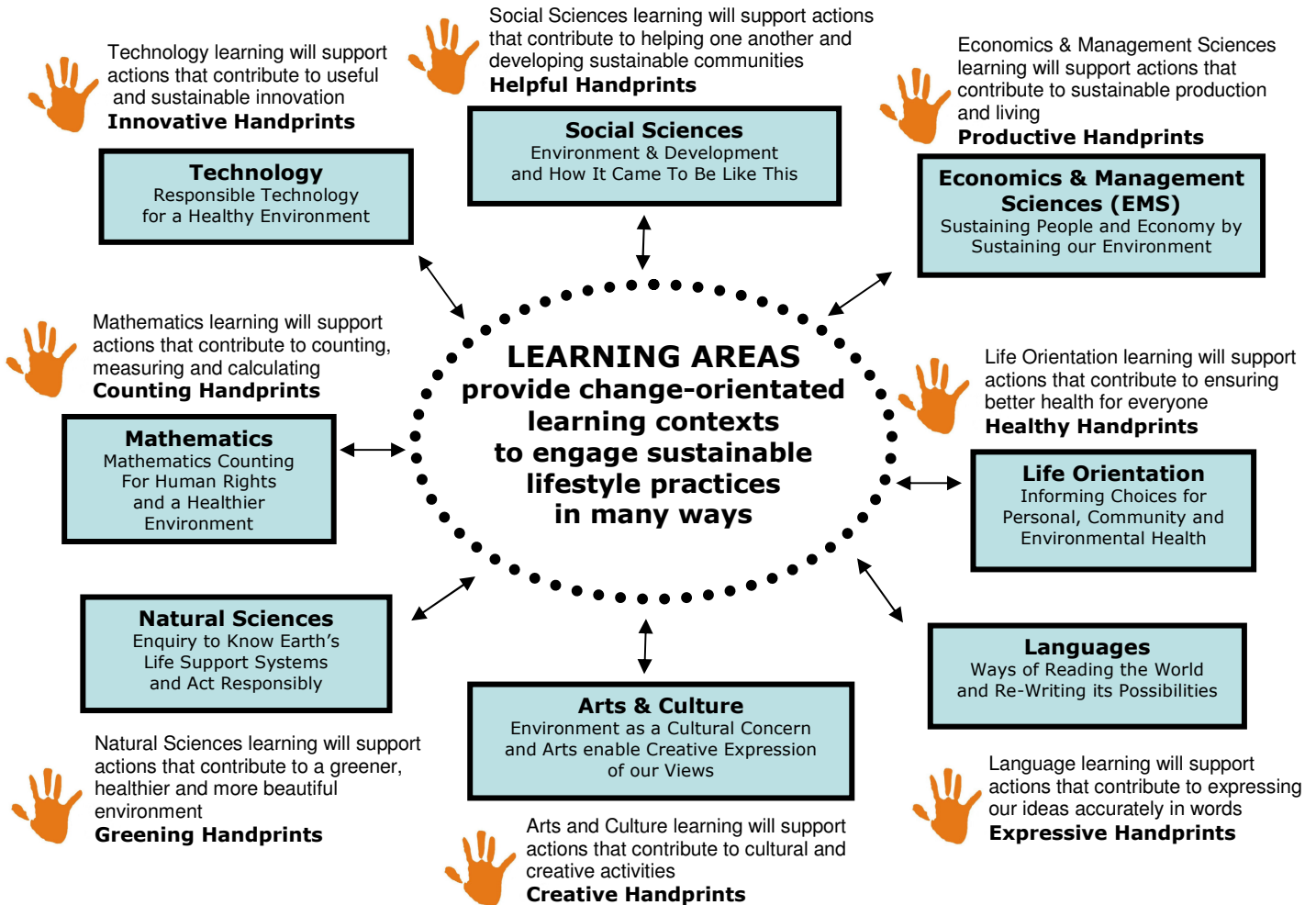
The resource books are intended to provide teachers with authentic start-up materials for change-orientated learning. The aim is to work towards re-imagining more sustainable livelihood practices in a warming world. Each start-up story was developed as a **reading-to-learn** account of environmental learning and change. Included are copies of the knowledge resources that informed those involved in the actual learning experiences described here. Working with local cases of learning and change has allowed us to develop the resource books around **locally relevant knowledge resources** and **practical learning activities** that relate to our African context. We are grateful to teachers and Eco-School support groups who have willingly shared their learning experiences and activities.

The **Handprint Resource Books** are an attempt to work from authentic cases of environmental learning and change. They combine some of the best teaching and learning tools that are being used to support change-orientated learning in the everyday realities of our South African schools. The resource books include:

1. **Start-up stories** with **knowledge support materials** (*Reading for information to build up a picture*)
2. Questions to **talk** about (*Talking to clarify issues and to plan local enquiry*)
3. Tools to **find out** about local concerns (*Writing about and reporting on local issues*)
4. Things to **try out** (*Writing up and reporting on what has been tried out*)
5. Ideas to **deliberate** (*Discussing, weighing up and recording decisions that will allow us to 're-imagine and re-write' our sustainability practices in a warming world*).



# Change-orientated learning & the curriculum



The activities in this book can be used to support learning in the **Social Sciences, Technology, Life Orientation, Arts and Culture, Economics and Management Sciences** and **Language** learning areas, and can contribute to the development of **Helpful, Innovative, Healthy, Creative, Productive, and Expressive Handprints.**

Teachers should consult the learning outcomes and assessment standards and should adapt the activities to suit their grade requirements.

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## Ideas and Tools for Local Learning

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## Waste reduction and creative re-use beats recycling at a Grahamstown school

### Key words

Aluminium

Audit

Eco-School

Recycling

Sustainable



An Eastern Cape teacher and her class started an Eco-School initiative because they wanted to make a difference in their community. The teacher gave a lesson on

waste **(SM 1)** and the Grade 7 class decided to start a recycling project that would link in well to the resource use theme for an Eco-School programme. The rest of the school was enthusiastic and they raised money to make a shelter for a waste collecting site. By the end of the first year, a waste recycling centre had been developed and useful waste was being brought to the school for recycling. The school was awarded an Eco-School green flag due to the success of this initiative. Everyone was proud of what had been achieved.

The project started gaining momentum and the waste kept on arriving from enthusiastic parents and children. However, the centre started to become a dumping ground as people brought more and more waste paper, aluminium cans, bottles and plastic for sorting and recycling. At one point a wind storm blew the waste that had not yet been sorted, right out of the school and into the town. The project was beginning to defeat its purpose as everyone seemed to have learned to bring their rubbish to school rather than make better choices that would reduce the amount of rubbish they collected and had to dump. If people were more careful about the amount of

waste they produced, recycling would not be as necessary.

Another issue to consider was global warming. Was it viable to increase carbon emissions through transporting recyclable waste to centres that were far away? For example, the nearest paper mill that added recycled paper into its production process was in Mpumalanga.

Exploring this question helped the group to understand why the local waste company stopped collecting as petrol costs increased and also why they were only interested in recycling high quality paper. Next to fail was the plastic recycling as the company only wanted certain products and not everything.

As doubts and collection problems developed, the class decided to undertake a life cycle audit of the four main types of waste being brought to the school: plastic, paper, metal and glass. Each of the four groups investigated the life cycle of the waste to find out how viable it was to recycle. They first considered:

- what waste would bring in the most money?
- what waste recycling would benefit the environment most?
- what was easiest to recycle locally?
- how much waste would be needed for collection to be worth while? and
- what was actually being done with the recyclable material? **(SM 2)**

The class found out that recycling aluminium cans brought in the most money. However, they also learned that recycling aluminium to make new cans has a high impact on global warming because of all of the electricity used. The group researching plastic found out it is difficult to recycle if a product contains many different types of plastic. However, the clear plastic found in coke bottles, for example, is easy to make into a grey cloth that can be used for drainage and habitat restoration.



After reading two articles, one in the local Oppidan Press (**SM 3**), and the other in the Mail & Guardian (**SM 4**), the Eco-School team realised that a new waste management strategy was needed. Recycling was becoming the sole driver and the original project to manage waste better was not leading to waste reduction. People were not buying less

and making choices of packaging and products where waste could be re-used in practical ways. They realised that with creative thought, 'a lot of stuff' doesn't have to be treated as waste at all.

Creative re-use can save money and the overall amount of waste can be reduced as less 'stuff' is bought from the shops.

Based on their new thinking the class decided to make note pads to re-use paper that had only been used on one side. Their creative slogan 're-use one-sided paper' helps to remind us to make better use of quality waste paper before recycling it. They decided to continue recycling aluminium cans, glass and the clear plastic from cool drink bottles but also to try to reduce their use of these. Martha's mother made lemon juice so she agreed to reuse some of the screw-cap bottles dumped at the recycling centre. They wrote a letter asking parents to please bring in only these four items: one-sided paper, aluminium cans, glass bottles and cool drink bottles.

The most important thing the learners learnt from this project was that reducing waste comes before recycling. This change in thinking allowed them to explore the 'zero waste initiative' (**SM 5**). The school now operates a much more efficient recycling depot and learners aim to 'reduce before recycling'.

### Glossary

**Aluminium:** a chemical element (chemical symbol Al). Aluminium is a light, silver-grey metal used for making pans etc. (*Oxford Advanced Learner's Dictionary, 7<sup>th</sup> Ed.*)

**Audit:** an organised and documented process for obtaining evidence.

**Eco-School:** a school participating in the Eco-Schools programme designed to encourage curriculum-based action for a healthy environment. It is an internationally recognised award scheme that accredits schools who are committed to continuously improving their school's environmental performance. (*WESSA; ecoschools@wessa.co.za*)

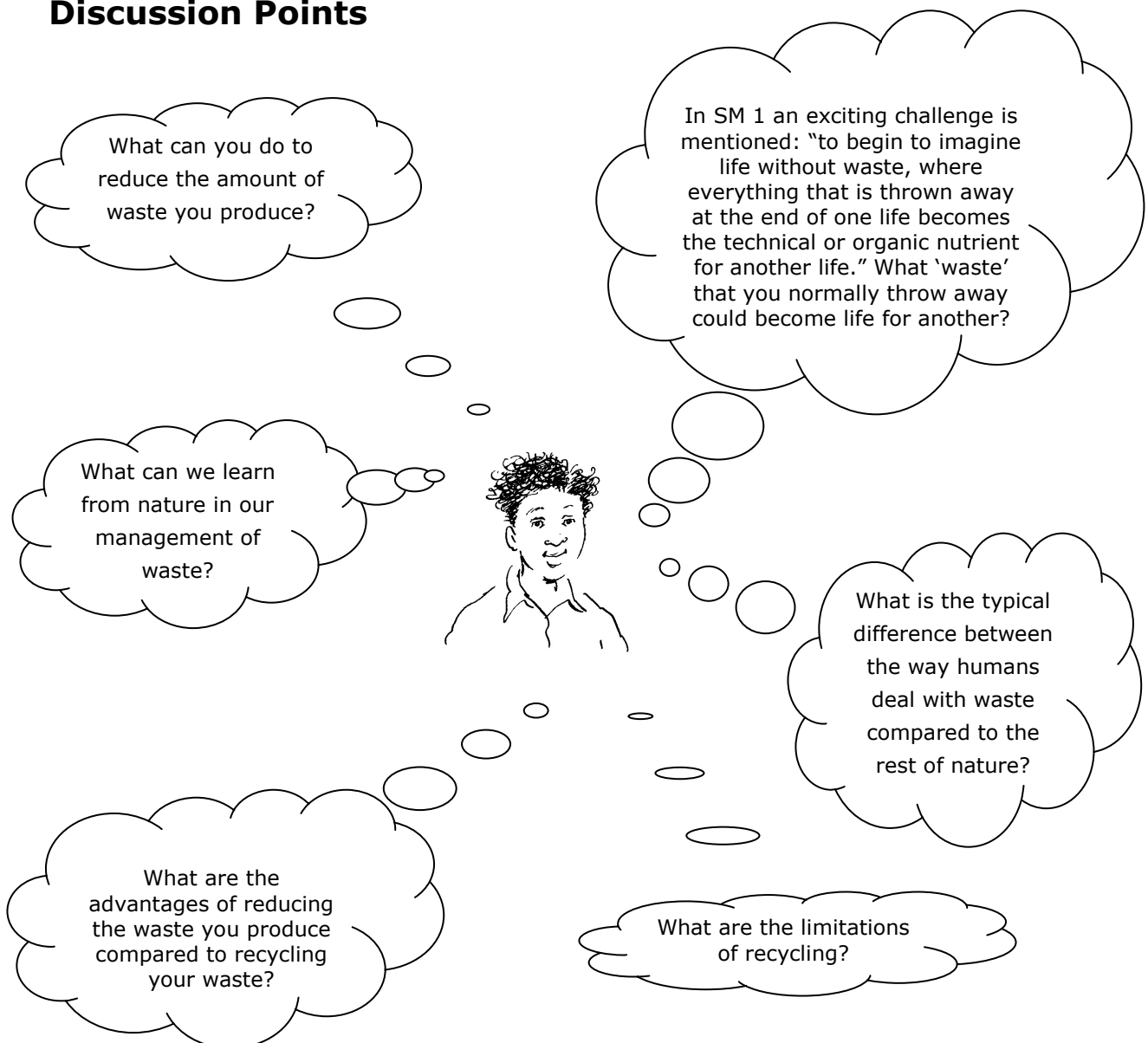
**Recycle:** to treat things that have already been used so that they can be used again. (*Oxford Advanced Learner's Dictionary, 7<sup>th</sup> Ed.*)

**Sustainable:** involving the use of natural products and energy in a way that does not harm the environment. (*Oxford Advanced Learner's Dictionary, 7<sup>th</sup> Ed.*)

## Comprehension Questions

1. What problem resulted from enthusiastic parents bringing their rubbish to school?
2. Why do you think the project was beginning to defeat its purpose?
3. What are some of the problems of recycling?
4. What are the benefits of creative re-use?
5. Recycling is one practice to deal with the problem of waste in our society. What other things could you do?
6. What would the class find out by undertaking a life cycle waste audit? What are some of the important things you learnt through reading **SM 2**?
7. What message do you think **SM 3** and **SM 4** contained that influenced the change in strategy to creative re-use?
8. In what ways do you think the zero waste initiative differs from the original recycling project that the class did? (**SM 5**)

## Discussion Points



Add your own ideas and questions

## **FINDING OUT ACTIVITIES**

### **Activity 1: Undertake a waste audit**

1. As the teacher, bring to school a week's worth of waste from your home.
2. For health and practical reasons put the compost waste in a separate bag before you get to school. Also make sure the 'waste' is clean.
3. Get the learners to weigh this waste.
4. Work out how much this waste would weigh if you included every person's waste in the classroom.
5. Work out how much it would weigh if it was waste accumulated over the whole year.
6. Work out how much it would weigh if it included everybody's waste in South Africa over a whole year.
7. Separate out waste that can be composted, recycled or reused.
8. Re-weigh the remaining waste.
9. Work out the difference in weight between throwing all your 'rubbish' away, compared to composting, recycling and reusing the 'rubbish' that you can.

### **Activity 2: Investigate the potential of recycling and reusing waste within your community**

Investigate the recycling depots in your community. Calculate the distance from your school to each of these. Find out how far each recycling depot needs to transport the waste for it to be recycled.

Many homes also creatively re-use what seems to be waste. Ask each child to investigate what products are re-used in their own home. Each learner should report back to the class.

## **TRYING OUT ACTIVITIES**

### **Activity 1: Paper pads**

Get your class to make paper pads which they could either sell or use to take notes in class. Knowledge and activity support material 6 describes how to make these paper pads. You could mention to the learners the following two important benefits to making pads from paper.

1. It saves money and valuable resources as children don't need to buy paper pads. (To make one ton of paper 100 tons of water is needed).
2. The paper is reused in creative ways, rather than recycled. This reduces the carbon contribution as the paper does not have to be transported anywhere.

### **Activity 2: Recycled paper**

Help your class to make functional recycled paper. Support material 7 gives you instructions on how to make recycled paper.

### Activity 3: Seedling containers

An exciting way to use milk cartons is to turn them into containers for planting seedlings. The containers are an excellent shape for the plant's roots and decompose in the soil.

All you do is cut the plastic rim off using a sharp knife. Snip the bottom edges of the container so that water can flow through it. Put some good soil in it and plant your seedling. It's as simple as that.



## DELIBERATION IDEAS



To deliberate is to think carefully about, to consider, to discuss in a focused way, to weigh up and debate. Here are some ideas to support this process in your learners.

### How to better manage your school's waste

Think about the way that your school currently manages its waste. Deliberate how your school can better manage its waste and use this to guide the development of a school waste management strategy. Strategies include recycling, reusing and reducing the amount of waste.

Guiding questions to help learners decide what waste they should reduce, recycle and reuse include:

- The economic incentives to recycle the particular product
- The environmental costs to recycling the product
- The closest recycling depots
- Potential for creative reuse.



## A LESSON ON WASTE

The earth is a 'closed system' – nothing disappears. In nature, the cycle of life operates in a circular system and waste generated by one organism becomes food for another. Fallen leaves decay and the nutrients are returned to the earth, to become food again for the tree. An exciting challenge facing city communities is to begin to imagine life without waste, where everything that is thrown away at the end of one life becomes the technical or organic nutrient for another life.

### Defining waste

**Solid waste** is classified into two main categories: general and hazardous waste.

**General waste** does not pose an immediate threat to people or the environment and includes household waste, builder's rubble, and garden refuse, dry industrial and commercial waste. It may, however, with decomposition and infiltration by water, produce leachate (the liquid that oozes out of waste) which may have pollution potential and is likely to have hazardous properties.

**Hazardous waste** is any waste that may cause danger to health or to the environment, whether directly or when it comes into contact with other waste.

If anything in your dustbin has a use (can be reused by somebody else, recycled or repaired) it should not be there!

### Waste, pollution and the environment

Pollution is any substance that cannot be absorbed, used or managed by the environment. For example, toxic chemicals poured into natural water systems cannot be broken down by that system and will damage all organisms within it. Pollution can be harmful to living organisms.

Waste eventually returns to the natural environment – even if it takes a plastic bottle up to a thousand years to do so. When waste is not properly managed it causes pollution. As matter starts to decay in a landfill, a liquid called leachate is produced. If not treated, it can poison soil and groundwater.

One of the main greenhouse gases, methane, is produced when organic waste in landfill sites decays in the absence of oxygen. Methane is 21 to 24 times more harmful than carbon dioxide as it stores much more heat (that warms our earth, contributing to global warming) and remains in our atmosphere for hundreds of years.

### Reference

Smart Living Handbook. City of Cape Town. <http://www.capetown.gov.za/en/EnvironmentalResourceManagement/Pages/SmartLivingHandbook.aspx>



## THE RECYCLING CYCLE

### The benefits of recycling

- Reduces the amount of waste going into landfill sites, saving space
- Creates jobs and money for schools and organisations; generally, the most valuable recyclable materials are: steel, copper, aluminum, brass, mercury and zinc from appliances, light fixtures, cladding, flashes, plumbing, wiring and structural materials
- Reduces pollution and litter
- Saves raw materials needed to make new products
- Reduces the need to import expensive raw materials
- Slows down the consumption of the world's non-renewable (oil, coal and iron) and renewable resources (trees)
- Reduces energy costs in manufacturing of containers, packaging, etc.
- Saves water (used in packaging and product manufacture) - recycled paper uses 50% less water than paper that is made from wood pulp.

### Tins and metals

It does not matter if cans are crushed, rusted or burnt – they can all be recycled. About 400 tons of cans are recycled monthly in the Western Cape. Collect-a-Can claims to recycle 66% of all beverage cans in South Africa, providing **a source of income to more than 37 000 people**. Metals are used to make new products of the same quality – conserving irreplaceable natural resources. Aluminum is an expensive metal and thus can bring in a relatively high income when recycled. For example, the Collect-A-Can depot in Westmead pays R0.45 per kg for steel cans and R4.50 per kg for aluminum cans.

**Recycling tins and cans saves about 95% of the energy needed to make a new can from iron ore.** And recycling one aluminium can save you the equivalent amount of energy that a can half full of petrol would produce. If you recycled a six-pack of aluminium cans you could save enough energy to drive a car nine kilometres. (*San Diego County Office of Education 1991. RAYS – Recycle and You Save*)

### Cardboard and paper

Cardboard and paper are excellent materials for recycling. **For every ton of paper recycled, 17 trees are saved, 40% less energy and 30% less water is needed to make paper.** For example, if you managed to recycle a ton of writing paper, you would save 26 500 litres of water. (*Newman, S. & Schwarz, M. 1993. 50 Simple Things Kids Can Do to Recycle. Berkeley, CA: EarthWorks Press.*) Recycling paper also reduces the amount of air pollution produced by 74% and water pollution by 35%. (*Paper Stock Institute. 1990. "Why Recycle Paper?" Recycling Paper*)

Do **not** recycle:

- Wet or dirty paper (tissues, paper towel, food wrappings, paper with spills)
- Wax- or plastic-coated packaging for liquids (milk cartons)
- Self-adhesive paper (including post-it notes and envelopes)

- Carbon paper
- Chemically-treated fax or photographic paper
- Dog food bags, potato bags, wax-coated boxes.

## Plastics

Plastics generally do not degrade as they are made from petroleum-based chemicals (oil, coal and gas). They can be a problem to recycle because they are often combined with other materials. Plastics are made from different plastic polymers. It is important that similar plastics are recycled together. Find out from your nearest drop-off centre what plastic types they accept. Unfortunately, other than for PET, HDPE and LDPE plastic types, there is very little demand within the recycling industry in South Africa to recover plastics from post-consumer sources, which means they currently end up at a landfill site.

### Typically, the following kinds of plastics are grouped together for recycling:

ID Number	Plastic Resin Type
1	PET: polyethylene terephthalate
2	HDPE: high-density polyethylene
3	PVC: polyvinyl chloride or V (vinyl)
4	LDPE: low-density polyethylene
5	PP: polypropylene

PET bottles can be made into polyester that is used to make products such as carpets and clothes. 11 recycled plastic bottles can make a pair of men's trousers. It can also be made into a grey cloth that is used for drainage and habitat restoration. There is only a little bit of money to be made from a lot of collecting: you could get R1.50 if you collected and sold 21 used plastic bottles.

### Glass bottles and jars

- Recycling a glass bottle saves enough electricity to light a 100W bulb for four hours.
- For every ton of glass recycled, 1.2 tons of raw materials and 114 litres of oil energy are saved.
- It is important to remove bottle tops and corks from glass bottles and containers.
- Certain glass products cannot be recycled.

### Reference

Adapted from  
Smart living Handbook. City of Cape Town. <http://www.capetown.gov.za/en/EnvironmentalResourceManagement/Pages/SmartLivingHandbook.aspx> (facts and figures taken from the Fairest Cape Association and DEAT's Responsible Tourism Manual)



## TURNING YOUR JUNK INTO FUNK

Michal Blaszczyk

The Oppidan Press 08. 10. 08

With student budgets running low, we thought we'd offer you a few tips on how to save on decorations and other bits and bobs for your digs, while at the same time becoming more ecologically-friendly. All you need is a little creative flair and some rubbish.

For starters – what to do with all those cans? Well, besides recycling them, you could convert your used cans into personalised pencil or toothbrush holders. After you've thoroughly washed the can and sanded down the inner edges, paint it or wrap it in funky wrapping paper or a cool picture. *Et voila!* Say hello to your very own homemade pencil holder.

Papier-mâché is another good way to go. To create your tailor-made papier-mâché bowls – a handy thing for holding anything from chips and popcorn to jewellery and stationery – all you need is newspaper, flour, cling wrap and a bowl.

- To make the paste, boil 1 part flour with 5 parts water until a glue-like consistency is formed. Leave the paste to cool down until lukewarm.
- Tear, don't cut, the newspaper into strips.
- Cover the bowl with cling wrap.
- Dip the strips of newspaper into the paste, making sure they are completely covered. Then cover the outside of the

bowl with the strips. Do about four layers.

- Leave to dry for about five hours, and then remove the bowl. Leave until completely dry.

For a nicer smelling bowl, add some cinnamon to the paste mixture. For interesting textures and colours you can add pressed flowers. Paint the bowl as desired once it is completely dry. For those who want to sculpt their own works of art, tear the newspaper into tiny pieces and mix with the solution to create a kind of mush. Then sculpt at will.



A papier-mâché bowl made with added pressed flowers



## MAKING THE CASE FOR LESS WASTE

**Nichole Sunshine**

**Mail & Guardian 12. 08. 08**

Waste is costly. The earth is a closed system. Any nutrients and resources being taken out of the system (and buried in a landfill, or burnt) are resources lost to us. Aesthetically waste causes various forms of pollution, from land to water pollution, to blocked drains caused by littering.

The waste we put out in bins from our homes each week is really just the tip of the iceberg. For every product you use each day, such as paper, clothing or food, substantial waste has been generated in the making of the product. It is estimated that as much as **90% of the materials used in the manufacture of a product become waste almost immediately**. Less waste means that we really need to think about what and how much we really need to consume.

### **Noteworthy facts:**

- To produce one ton of paper, 100 tons of water are used.
- For every litre of beer you drink, 10 litres of water have been used in the fermenting process.
- Producing one cell phone requires 75 kg of resources.
- A toothbrush requires 1,5 kg of resources – coal, oil and water – for its production.

Generating less waste ensures that smaller amounts enter landfill sites and saves valuable space. This drastically delays the need to clear new areas and destroy natural habitats.

Every year in the Western Cape, enough waste is thrown away to fill a row of trucks equalling the distance from Cape Town to Gauteng – that is about 1 200 kilometres!

### **Waste is not waste until it is wasted**

Large amounts of resources are used to generate the products we use, many of which do not decompose in nature. Non-renewable resources are used to make the aluminium, plastic and glass found in our products – often simply as packaging. Mining these resources requires energy and money and is harmful to natural habitats.

There are a number of benefits to reusing and recycling many of the 'waste' products from our homes:

- The demand for new materials will be reduced, reducing the need to mine non-renewable resources.
- The use of energy and water will decrease as smaller amounts are needed for recycling as compared to making new products from extracted (mined) resources.

When more materials from our refuse are recycled, less waste will be dumped into our landfill sites.

### **Reference**

Smart living Handbook: City of Cape Town.  
<http://www.capetown.gov.za/en/Environmental Resource Management/Pages/SmartLivingHandbook.aspx>



## ZERO WASTE

### Making the conceptual leap

Many suggest that recycling of waste, while possibly an important interim measure, is simply being **less bad**, or is an attempt to make a **bad system** more efficient. Recycling offers the recapture of small amounts of smashed up materials. It is inefficient and difficult as the products are not designed for reuse. The best that recycling has to offer is the destruction of products after one use (through smashing, chopping, grinding, etc. at a notable cost in resources, particularly water and energy) and laborious recapture of only the bare materials.

The ZERO WASTE strategy calls for a totally new approach to the design of products and the methods of production. The zero waste strategy suggests that we look to nature for inspiration. Take the example of ants. All the ants on the planet together have a greater biomass than humans. Although they have been industrious for millions of years, their productivity nourishes plants, animals and soil. Human industry in the past hundred years alone, by contrast, has seen a decline in the health of all the ecosystems on the planet.

Zero waste looks to intelligent design, drawing on the principles and examples of natural ecosystems, where waste from one cycle becomes food for another. In this system products would be designed to be healthy and renewable in the first place. *Waste* is eliminated altogether.

For further information contact: the Institute for Zero Waste in Africa. Tel. 083 471 7276 or zerowaste@iafrica.com

#### Reference

Smart living Handbook: City of Cape Town. <http://www.capetown.gov.za/en/EnvironmentalResourceManagement/Pages/SmartLivingHandbook.aspx>

# MAKING PAPER PADS



## Equipment needed

- paint brush with end cut off
- wood glue
- heavy object (e.g. a brick wrapped in a cloth/ newspaper or a railway sleeper)
- tray for paper
- a wad of scrap paper used on one side only

## Steps to making paper pads from 'waste' paper

1. Collect enough one-sided paper to make a pad.
2. Make sure the paper is all the same side up and is lined up.
3. Put the pad of paper on a tray, right to the edge.
4. Place a heavy object on the pad of paper. It could be a railway sleeper or a brick wrapped in a cloth or newspaper.
5. Cut off the end of a paint brush to give it hard bristles.
6. Put some wood glue on the brush and then paint the edge of the paper. Also jab/stipple the brush to the paper so that glue goes inside.
7. Put extra glue on the edges of the paper as this is where the paper most easily comes undone.
8. Scratch the paper when the glue is still wet as it will give you a stronger bond.
9. Leave it for about 2 hours.
10. Repeat the gluing process if required.



## MAKING RECYCLED PAPER

Recycling paper is simply a process of turning waste paper back into pulp. The pulp is then recaptured on a gauze to once again become a sheet of paper. Pulp is made with warm water and postage stamp sized pieces of paper. After soaking to soften, it is shredded up into pulp with a hand food-mixer or egg beater.

The best way to start making your own paper may be to buy or borrow a recycling kit. There are a number on the market and all have advantages and disadvantages. Another option is to develop your own paper making technology and to branch out into making other things from pulp. Valuable products are egg boxes and vegetable trays. For these, use a thick soup of pulp and a pressure mould to squeeze out the excess water.

Recycled paper can be used as covers for projects, as art paper and to make envelopes, to mention only a few options. To make card, simply use a thicker pulp mix. Part-drying and then ironing between a fine cotton material produces smooth and textured paper. Pulp can also be dyed and mixed for a mottled effect. The best dyes that are least polluting are food colouring and stamp-pad ink. It is best to dye the pulp before adding it to the trough for paper making. Try to avoid using strong chemical agents to make paper white as waste disposal then becomes a problem.

### Instructions

1. Tear the paper into postage stamp pieces and soak them in warm water for 3-4 hours.
2. Make up the paper making frame by sandwiching gauze (mesh) between two wooden frames that are slightly larger than the size of paper you want to make.
3. Mix the pulp with warm water in a large basin.
4. Hold the frame firmly with the gauze uppermost. Insert the frame at a steep angle into the basin with the pulp; hold it in the basin at a level so that the gauze is filled with pulp; then slowly lift out of the basin.
5. Drain the water while holding the frame level.
6. Lift off the top frame. Using both hands lift up one end of the gauze. Place the paper on a drying board – masonite, formica and perspex are best. Sponge out the water. Lift off the gauze. Dry in the sun or overnight.

### Notes













- The quality of the paper is dependent on the quality of the waste paper that is pulped.
- Formica or perspex are smooth surfaces suitable for laying out paper to dry.
- Dry all equipment after paper making.
- To avoid bubbles being trapped under the paper, lay out the paper with a slow rolling motion.

### Reference

Adapted from a Share-Net resource compiled by the Environmental Education Services, Natal Parks Board. 1995. *How to series: Make recycled paper*. Howick.



## Handprint resource books available from Share-Net

TITLE	LEARNING AREAS COVERED (BROADLY)
 <b>1.</b> Reusing Shower and Bath Water	Language Natural Sciences Technology
 <b>2.</b> The Buzz on Honey Bee Economics	Language Natural Sciences Social Sciences Technology Economics & Management Sciences
 <b>3.</b> Have you Sequestered your Carbon?	Language Natural Sciences Technology Mathematics
 <b>4.</b> Did you Grow your Greens?	Language Natural Sciences Social Sciences Life Orientation Arts & Culture
 <b>5.</b> Clearing Invasive Weeds	Language Natural Sciences Technology
 <b>6.</b> The Secret of a Spring	Language Natural Sciences Social Sciences Life Orientation Technology Mathematics
 <b>7.</b> The Secret of the Disappearing River	Language Life Orientation Social Sciences Economics & Management Sciences
 <b>8.</b> Creative Garden Design	Language Natural Sciences Technology
 <b>9.</b> Recycling, Waste Reduction and Creative Re-use	Language Social Sciences Life Orientation Arts & Culture Technology Economics & Management Sciences
 <b>10.</b> Worming Waste	Language Natural Sciences Technology
 <b>11.</b> Growing Mother-tree Seedlings	Language Natural Sciences Technology
 <b>12.</b> Rooibos: a Biodiversity Economy at Risk	Language Natural Sciences Economics & Management Sciences

Many more Handprint resource books are in the planning stages. These resource books and many others for teacher educators and teachers are available electronically in pdf format on [www.tessafrica.net](http://www.tessafrica.net). The Handprint resource books can also be downloaded from [www.handsforchange.org](http://www.handsforchange.org).

The adaptive use of these resource books for educational purposes is encouraged. Anyone wishing to develop their own resource or adapt one, can contact Share-Net [sharenets@wessa.co.za](mailto:sharenets@wessa.co.za) for a version in Microsoft Word.



HAND PRINT™  
action towards  
sustainability

*This handprint is of a 10-year-old girl, Srija, from a school in Hyderabad, India, who was involved in a project taking action for sustainability. Her handprint can be taken as a symbol for positive action.*

## Increase your handprint. Decrease your footprint.

Human impact on the Earth has tripled since 1961 and our human footprint is now 25% bigger than the planet can support. In other words we are using 25% more natural resources and services than the planet can create and provide. The 'Ecological Footprint' is one way to measure what area of land and water the whole human population requires to produce the resources it consumes and to absorb its wastes, and we now need 25% more area than is available on the whole planet. This means that the planet is simply being damaged beyond what it can repair, and this cannot continue without causing very serious threats to all life, including our own.

Education is a key way to achieve the changes we need to live in a manner that the planet can support. Environment and Sustainability Education (an environmentally focussed approach to Education for Sustainable Development – ESD) is a move away from seeing education just as a means of producing the skills to carry on doing what we are doing. It develops the abilities needed to address the big issues affecting the planet, and builds the capacity in communities to make important decisions about their future. Environment and Sustainability Education calls for action.

The Handprint is one measure of Environment and Sustainability Education action. The idea is to decrease the human footprint and to make the world more sustainable. The Handprint is a new approach or 'tool' being developed by the Centre for Environment Education (CEE), in Ahmedabad India, with many partners across the globe. The purpose of the Handprint is to help measure **positive action for change** at different levels. We all need to decide **what we can do** at the individual, community, national and global level in order to increase our Handprint, and decrease our Footprint.

**“Through our actions, we add substance and vigour to the quest for sustainable living.”**

The Ahmedabad Declaration 2007: A Call to Action, 4th International Conference for Environmental Education



[www.handsforchange.org](http://www.handsforchange.org)