recycle for Scotland
ath-chuairtich airson Alba

The Highland Council
Comhairle na Gàidhealtachd

Waste and Recycling Education Pack 2012

Don't let a good thing go to waste
Na leig rud math a dhìth

Contents

About this pack

This pack is especially designed for teachers and educators in the Highland Council area who wish to cover the topic of waste and recycling. There is specific information about what recycling can be done in the Highlands and where our waste goes. This pack covers the problems we have with rubbish and why we need to Reduce Reuse and Recycle (The Three Rs). The issues are explained in a manner suitable as a background for staff or for working with pupils (upper primary – lower secondary).

Activities are suggested throughout this pack relating to the Three Rs, composting and disposal. There is also a comprehensive resources section, which references web pages with further information, online games, quizzes and downloadable activity packs from various organisations.

The Highland Council Waste Management Team also has a resource library from which you can borrow craft materials, books and samples of recycled products.

To arrange a visit at your school, borrow from the resource library, or for further information, please contact us:

The Waste Management Team, TECS, Ross House, High Street, Dingwall, IV15 9RY
e-mail: recycle@highland.gov.uk Tel: 01349 886603

February 2012

Curriculum Links

Geography	Location of services, distribution of resources globally and transport.
History	Change in waste and packaging over time and lifestyle changes.
Science	Materials, manufacturing processes, composting/decay and habitats.
Maths	School waste audits, calculations and graphs.
Music	Lyrics, songs, musical instruments made from recycled materials.
English	Poetry, drama, story-telling, writing and debating.
Art and Design	Posters, recycled fashion, recycled craft.
Technology	Product design, properties of materials and treatment & reprocessing technologies.
Religious & Moral Education	Poverty and exploitation.
Personal & Social Education	Lifestyles and environmental effects.
Eco Schools	Waste minimisation and litter are key topics in the Eco schools scheme.

National Priority 4:

Values & Citizenship	Global and local aspects of waste, recycling and resources can be looked at in terms of social and environmental issues.
Health Promoting Schools	Link waste prevention to healthy eating through a waste free lunches programme and integrate composting in the school grounds as part of the healthy school environment.
Enterprise Projects	There are plenty of opportunities for young entrepreneurs to tackle the issue of waste, ranging from raising awareness, recycled products, services and storage solutions.

Part 1: Background

What is Waste?

Waste is anything that is no longer of use to us. We throw things away that are empty, broken, used or just not wanted any more. Virtually everything we do creates waste, which means that we will always need to have ways of dealing with it. A well-known law of physics tells us that matter cannot be created or destroyed. We can change its physical form (solid, liquid or gas) or chemical form, but we cannot make it disappear. This is true when we throw something away - it does not disappear. In the Highlands we send our waste to landfill sites, where our rubbish is buried under the ground. In a landfill some items will decompose, which leaves behind rotted materials and gases. Other items will stay the same for hundreds of years. Another option is to use our waste to produce energy (e.g. by burning), but this still leaves us with ash, heat and gases.

There are different ways of dealing with waste which include recycling or finding other uses for some of it, but we will always have some waste which we need to dispose of.

The History of Rubbish

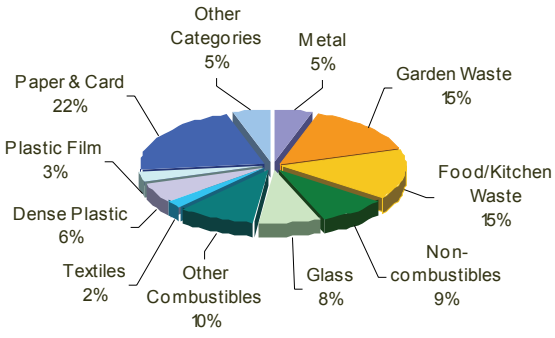
It is through waste that archaeologists have be enable to learn about early peoples and their way of life. In the Stone Age, people disposed of their waste by digging it into the land. In those days, waste was mainly bones, ash and vegetable remains. In other words the waste was made up mostly of biodegradable materials. By digging these materials into the soil, people not only got rid of their waste, but improved the quality of the soil for growing crops. Later, during the Iron and Bronze ages when metals were first being used, there was little change in what was regarded as rubbish. Metals were so valuable that they were rarely wasted. However some metal items may have been buried with important people.

This means that the waste from people of this time was rather similar to that of the Stone Age people, in that it was made up of a similar bits and pieces of biodegradable materials that rot down. Later in time, in the 19th Century, the first dustbin was introduced in the UK. In the year 1875 a law was made insisting that householders kept rubbish in a movable container. The same law also made the local authorities responsible for emptying these containers. Before this everything was thrown into the street!

Our Waste Today

About one quarter of the waste generated in the Highlands comes from households. Most of the rest of Highland waste is from building and demolition (57%) with the remainder coming from businesses. From studying the waste from households, we know about what sorts of materials people throw away. The pie chart shows the breakdown of what goes into the average household bin and the waste which is taken to the landfill skips at Recycling Centres by householders. As you can see, much of this could be recycled or composted such as the paper, card, textiles, cans, glass and garden waste.

Chart 1. Average composition of Highland household waste from refuse collections and items deposited in landfill skips at Recycling Centres (based on two analyses in April and September, 2009)



FACT BITE

In the Highland Council area nearly 102 thousand tonnes of municipal waste was sent to landfill in the year 2010/11 - this is enough for each household to fill one refuse sack every day!

The problem with waste

In Highland most of the rubbish that we put in the general refuse bin is sent to landfill sites. Landfill sites are holes in the ground into which rubbish is tipped and then crushed into layers. The waste is then covered with soil.

There are several problems with the way we currently deal with rubbish, not just here in the Highlands, or in the rest of the UK, but around the world.

Some of the main problems are listed below:

It is an unnecessary waste of the Earth's resources!

Everyday materials that are used to make items such as cans and paper will have either been mined on the other side of the world (bauxite for aluminium), or taken years to grow (trees for paper). All of which involves the use of energy, water and labour. In addition, these processes also create their own waste, which is known as pre-consumer waste. Instead of wasting these resources, we can reduce the amount of waste that we landfill by recycling more. This way we will reduce the demand for raw materials. Making products from recycled materials also saves energy. It generally takes less energy to transport and prepare them for production than using raw materials.

We are running out of space in our current landfills!

Landfill capacity within the Highlands has significantly reduced over the past numbers of years with the closure of the landfill sites at Inverness (2003) and Skye (2006). The rubbish which would previously have gone to these sites is now transported for landfill disposal out-with the Highlands. There are two operational municipal landfill sites in the Highland Council area - at Seater by Wick and Granish by Aviemore. Most of the waste from Lochaber goes to a privately run landfill at Duisky. In order to meet the Scottish Government's Zero Waste targets (to increase recycling to 50% by 2013 and 70% by 2025), The Highland Council's current Waste Management Strategy sets out a range of recycling services and new waste treatment options. A new recycling and refuse service is being introduced throughout the area, including ti the Council's commercial customers. Waste treatment options being considered for the remaining residual waste include anaerobic digestion (AD) and Energy from Waste (EfW).

The cost of landfilling is increasing each year!

The cost of landfilling our waste comes from taxes so ordinary people are paying for this. Landfill Tax is rising by £8 a year. In April 2012 it will rise from £56 to £64 per tonne. Much of what is in the bins doesn't need to be there, as it could be recycled or composted.

Pollution!

There are two main types of pollution associated with landfilling our waste.

Methane – which is a greenhouse gas. This is produced as organic material rots down without air. Methane and other greenhouse gases trap heat from the sun maintaining the Earth's temperature. An increase in the greenhouse gases in the atmosphere could mean warmer wetter winters, less snowfall and more flooding in Scotland. Methane is not produced when organic material is composted, as there is plenty of air present during the composting process. Instead carbon dioxide CO_2 is created, which is also a greenhouse gas but not as potent as methane.

Leachate – this is the liquid that is formed as rainfalls on the landfill and seeps down through the rubbish. As it drains down it can pick up substances from the waste. Modern landfills are better engineered to reduce pollution because leachate is collected and treated and gas is either flared or used to create electricity.

DISCUSSION POINT

What we do with our waste today is very similar to what we did thousands of years ago – i.e. digging it into the ground. However, now we have much bigger towns and cities, and we are producing much more waste, and much more of it is non-biodegradable. Think of the archaeologists of the future - what treasures will they find from our time?

The future

Scotland's Zero Waste Plan

The Scottish Government's Zero Waste Plan sets out a vision of a zero waste society in which all waste is seen as a resource, where waste is minimised, valuable resources are not disposed of in landfill and most waste is sorted, leaving only small amounts to be treated for landfill. The plans include a Waste Prevention Programme for all waste, ensuring prevention and reuse are thought about first. Organic material that will produce greenhouse gas emissions, will be banned from landfill and instead treated to give valuable resources such as compost and methane to be used for heating and electricity generation. Within The Highland Council we may see the introduction of a food waste collection service in some areas.

Current Recycling facilities with the Highland Council region: Kerbside Recycling Collection

The Highland Council first introduced a kerbside recycling collection service in 2003. In September 2010 a programme began to introduce a mixed kerbside recycling collection to all households in The Highland Council area. Paper, cardboard, plastic bottles and food tins & drink cans are collected fortnightly from blue wheelie bins, alternating with a fortnightly collection of general refuse. The change from weekly to fortnightly refuse collection means that most people will have to think more carefully about what they are throwing away - can they recycle or compost it Instead, for example? Areas which already had garden waste collections from brown wheelie bins will continue to receive these. The materials collected in the blue recycling bins are taken to a special plant called a Materials Recovery Facility (MRF) where they are separated out, compacted into bales and sent away to factories to be made into new products. The new alternate weekly collection (AWC) will be introduced to all areas of Highland by July 2012.

Recycling Centres

A Recycling Centre has members of staff to help you recycle many types of household waste. There are 21 Recycling Centres across Highland. Some of them have been re-vamped recently with new signage to make it clearer what can be recycled. The range of materials collected is continually being increased. There has recently been a big increase in the range of waste electronic and electrical equipment (WEEE) collected. This now includes small electrical goods (anything that has a plug or uses batteries, from a lawnmower to a watch). Domestic batteries can also now be recycled as can low energy light bulbs and fluorescent tubes.

How many different items can you think of?

Recycling Points

A Recycling Point is an unmanned site, where you can recycle a range of materials, such as paper, textiles, cans, glass bottles and jars. Recycling Points are found in places like supermarket car parks and community centre car parks. The Council has over 200 Recycling Points spread throughout the Highlands, and continues to improve the range of materials recycled at each Recycling Point. Some Recycling Points now have containers for books and DVDs.

These recycling schemes have successfully resulted in a significant increase in the recycling rate from less than 2% in 2001/2 to 40% in 2011.

The Highland Council Waste Awareness Team

In addition to these improvements to the recycling services, the Waste Awareness Team aims to encourage everybody not only to recycle their waste, but to cut down on waste in other ways too, such as home composting. The Waste Awareness Team carry out various tasks including monitoring kerbside collections, conducting doorstep campaigns, attending road show events and participating in community events. The team is also on hand to visit schools to deliver talks and workshops, including helping to conduct waste audits.

Part 2: The Waste Hierarchy

Reduce Lughdaich **Reuse** Ath-chleachd **Recycle** Ath-chuartaich

When people set about doing something to tackle the problem of waste, recycling is usually the first thing that is thought about. Recycling, while important, is not the only way to minimise the amount of waste that we produce. A concept that is used to describe the ideal means of dealing with waste is the waste hierarchy – also called 'The Three Rs,' that is Reduce, Reuse, Recycle. At the top of the waste hierarchy is reduce, then reuse, and then in third place, recycle, with disposal as the least desirable option. This hierarchy reflects the amount of resources that are used in terms of materials, energy and water. Therefore at the top (Reduce) there is greatest conservation of resources.

This system can be compared to getting a grade in a test. Recycling is great – it gets a 'C' grade, which is a pass, but ideally we should be aiming to get a higher mark – to reduce ('A') or reuse ('B'). Just like the rest of the UK the amount of rubbish we produce in Highland is growing. There are a number of reasons for this. For instance there are a lot more houses now, each producing more waste. We've all got a wee bit more money to spend and there are lots of pressures coming from advertisers encouraging us to spend that money on the latest gizmo, whether we need it or not. However one of the biggest culprits is over-packaged goods.

FACT BITE

If Scotland's lifestyle habits (energy & water use, food and waste) were repeated throughout the world, two planets would be needed to cope with the demand. Source: Scotland's Footprint - Analysing the ecological impact of Scottish living habits in 2001

Targets are in place for increasing the proportion of our waste that is recycled and to reduce the amount of biodegradable waste that is sent to landfill. The recycling rate target for the Highlands is 50% by 2013.

The Scottish Government's Zero Waste Plan states that by 2025 recycling needs to be increased to 70% and that waste going to landfill must be reduced to 5%. In March 2009 The Highland Council produced a joint Waste Strategy with Moray Council to identify how these targets are to be met. The Highland Council is considering treatment options to deal with organic waste – such as kitchen waste. Some residual waste may also need to be treated through an energy from waste plant to deal with the 25% of residual waste that cannot be recycled or composted.

These challenging targets for addressing the problem of our waste will mean that major changes in behaviour are needed.

FACT BITE

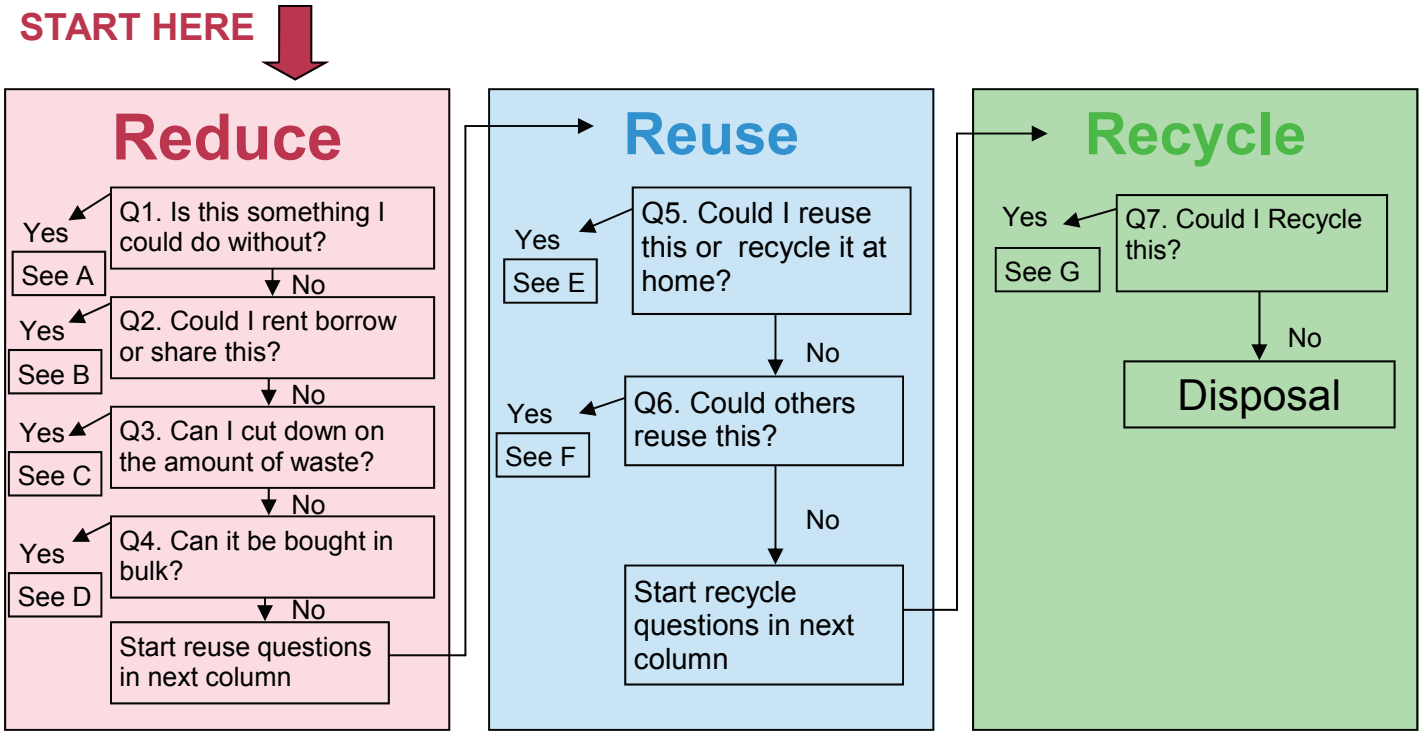
Arresting global warming and environmental degradation will require a 50% reduction in world-wide material consumption. This means that industrial countries need to aim for a 90% reduction in their throughput of materials. Source: Wuppertal Institute for Climate, Environment and Energy

Use the waste hierarchy to make less waste

If you would like to make a difference to your own waste, you can use the waste hierarchy to help you make decisions about what changes to make. You may find that there are simple habits you can change that don't always involve recycling or composting! The chart below had been designed to help see how you can Reduce, Reuse and Recycle your waste. There are some worked examples on the following page.

The Waste Hierarchy Chart

How do I make less waste?



A) Some aspects of our lives that generate waste (e.g. fizzy drinks, or keeping pets or even using bubble bath!) are not always crucial, but may provide enjoyment or improve our quality of life in some way. The decision about whether to give something up can be very personal, so it is therefore up to you to weigh up the options.

B) By renting, borrowing or sharing a range of items, you reduce the goods that you consume and therefore prevent waste in the future. There are a range of things that can be rented or borrowed – ranging from books and DVDs from a library or rental club, glassware, cleaning equipment and DIY machines & tools (e.g. carpet cleaners and cement mixers). To formal wear or fancy dress clothing, and sporting equipment such as bikes or skis. You may also be able to share a range of items with family or friends, such as games and toys, sports equipment.

C) Lower waste alternatives can involve a range of options, for example buying the same goods packaged differently (switching from tinned fruit and vegetables to fresh produce), avoiding or reducing the quantities of materials that are currently not possible to recycle in the Highlands, making things for yourself (e.g. cooking from scratch with fresh ingredients) or perhaps even purchasing from a different place such as a wholesale retail outlet, a greengrocers, a butchers, a bakers or a farm shop.
It is also worth considering the durability of items purchased – the longer the life-span, the less waste in the long run. A further consideration is the relative toxicity of the materials. Try to avoid items that need batteries and choose rechargeable batteries if necessary.

D) Bulk buying can significantly reduce the packaging to product ratio and may be cheaper.

E) Reusing items or recycling at home (e.g. papermaking or rag rugs) to extend their life is great, because it keeps our waste to landfill down and in many cases it can save you having to buy another product too, effectively reducing waste at the same time!

F) It could well be that reuseable items you regard as waste, could be another person's resource (e.g. shredded paper as animal bedding)

G) If an item is recyclable, then we should make the most of the facilities available!

Using the Waste Hierarchy Chart - Worked Examples

Newspaper:

Q1 - Yes – you could learn about the news by watching TV, listening to the radio, or on the internet.
Q2 - Yes – you could visit a café or library with newspapers available or could share with friends.
Q3 - Yes – could cut down and only get a paper when there is time to read it, or just get weekend newspapers.
Q4 - No – newspapers are not suitable to buy in bulk.
Q5 - Yes – you could make paper logs, paper seedling pots, make papier-mâché crafts etc.
Q6 - Yes - someone may be interested in using this for animal bedding.
Q7 - Yes – you can recycle newspapers at Recycling Points, Centres and through the kerbside collections in your area.

Plastic milk bottle:

Q1 - Yes – it is possible to live on a milk-free or vegan diet, however this may not suit everyone.
Q2 - No - it is not suitable to share this to help reduce waste.
Q3 - Yes – you can buy milk in different types of packaging, such as in re-useable glass bottles, a cardboard carton or a box of powdered milk.
Q4 - No – milk is not suitable to buy in bulk.
Q5 - Yes – you could use plastic milk bottles to make garden cloches, plant guards, or in other craft activities, however, you may produce more milk bottles than you would want to reuse or recycle in this way.
Q6 - No – while other people could reuse or recycle these, it is less likely that others will want your bottles, because people tend to use lots of milk and will have more bottles than are needed for reuse or home recycling projects.
Q7 - Yes - you can recycle plastic milk bottles and other plastic bottles using the kerbside recycling service if you have a blue wheelie bin. You can also take plastic bottles to Recycling Centres. The bottles should be rinsed, squashed down and the caps removed.

Football:

Q1 - No – the keen football player will not give this up easily!
Q2 - Yes – you could share this with your friends or brothers or sisters.
Q3 - Yes – when choosing a new football, look for a durable one that will last longer and also look for one with less or no packaging.
Q4 - No – it is probably not suitable to buy this in bulk.
Q5 - No – unless you can come up with an original creative project!
Q6 - No – see above
Q7 - No – footballs are made up of different materials, which cannot easily be recycled.

Cereal box:

Q1 - Yes – you could have something different for breakfast, but not everyone will be willing to stop eating their favourite cereal!
Q2 - No – it is not suitable to rent, borrow or share this!
Q3 - Yes – It may be possible to buy cereal in just the plastic bags, rather than a bag in a box (e.g. at a wholesalers).
Q4 - Yes – The larger the box, the lower the ratio of packaging to product. Try to avoid the individual helping sized boxes, as these create the most waste.

Q5 - Yes – you can use the cardboard for craft projects, or add this to your home composter.
Q6 - Yes – it is possible that these could be used at school or at a nursery.
Q7 - Yes – the cardboard cereal box can be recycled using the kerbside

Reduce

Decreasing the amount of waste produced.

Reducing the amount of waste that is produced in the first place is the most important thing that we can do to with regards to improving our waste management practices. It can also be the hardest, because it means changing habits not just in what we do with things when we're finished with them, but changing our consumption habits to choose less waste. Some simple tips are suggested below for use at school and at home.

FACT BITE

Scottish households throw away 566,000 tonnes of food waste every year. Over two thirds of this could have been avoided if it had been more effectively planned, stored and managed. Avoidable food waste costs Scotland nearly £1 billion a year, that's the equivalent of £430 per household! www.zerowastescotland.org.uk/lovefoodhatewaste

Top REDUCE tips for School:

- Ensure that everyone knows to photocopy on both sides.
- Set printers up to print double sided as a default setting.
- Print two pages to a sheet as another paper-saving measure.
- Have a box of one-sided scrap paper available by printers and photocopiers.
- Encourage everyone to print e-mails only when absolutely necessary. Consider adding reminders to e-mail signatures to encourage others not to print messages unnecessarily. If you do print out e-mails be careful to avoid printing out duplicate copies of the original messages.
- Only use one paper towel at a time.
- Avoid disposable, single use products, such as cleaning wipes.

Top REDUCE tips for Home:

- Choose less packaged goods, for example buy fruit and vegetables loose.
- Buy concentrated products that use less packaging, such as cleaning products, concentrated fruit juice and squash.
- By choosing items such as wind-up torches, radios, watches and toys together with solar powered items such as garden lights you can help to reduce the amount of batteries that you need to dispose of.
- By repairing your household items you can extend their life and reduce the amount of waste you have to throw away.
- Look after stuff so that it lasts longer. For example, don't leave your bicycle out in the rain to rust and remember to oil the chain, bearings and cable regularly and keep the tyres pumped properly so they don't crack.
- You can reduce your waste by using multiple use shopping bags made from cotton or jute. Sturdy plastic 'bag for life' shopping bags are also useful.
- If you hire rather than buy you may save money and cut down on items that you may only need for a limited time. There are a range of items that can be hired readily from glassware to costumes, video & DVDs and bicycles.
- Registering with the Mailing Preference Service can stop unwanted mail that is delivered to a named addressee at your address. Call 0845 7034599 or visit www.mpsonline.org.uk
- Another service to reduce unwanted mail is the Royal Mail Door to Door service. This can stop mail that is delivered to you without an address such as leaflets, fliers etc. To find out more: visit www.royalmail.com, email optout@royalmail.com or call 08457 950 950.

Reduce - Activities

Posters

To encourage the whole school to remember to cut down on waste, design posters about all the things that can be done to reduce your waste.

Waste-free lunches

Making changes in behaviour is great – and even better if you can measure it to keep an eye on how well you are doing. But when you start to do more things to reduce your waste, it is harder to measure, because after having carefully avoided lots of waste, you have nothing to put on the scales! One way that you can monitor your success is to start a project where regular measurements are taken – and remember to start measuring before you make the changes. This activity involves examining the types of packaging that can be found in a lunchbox. We need to package our food to keep it fresh and to keep it intact. However there are several types of packaging that go straight into the bin that could be avoided.

Typical Lunch Packaging

- Food held in a plastic carrier bag
- Food wrapped in clingfilm or aluminium foil
- Individual juice carton, pouch or Fruit Shoot bottle
- Individual crisp bags or biscuit mini-packs
- Bought sandwiches in plastic packets
- Plastic disposable cutlery, paper

Low Waste Packaging

- Reusable sealed boxes
- Refillable water bottle – fill it with your favourite squash
- Put small quantities of crisps and biscuits from bigger packets into little containers
- Fruit – compost the apple cores, orange peels and banana skins
- Make your own biscuits and cakes. Keep them fresh in a sealed box

Before lunch, mention that at the end of lunch you will be looking at the lunch boxes, so ask the class not to put litter in the bins, but to keep it in their boxes or bags.

At the end of lunch time, collect the rubbish separating out the compostable waste such as fruit and vegetable left-overs. Make sure that there is nothing left in the lunch boxes, except for reusable boxes and bottles. Look at the compostable waste first – you may wish to collect this in a box (or compost caddy if you have one) either for composting (if your school does composting) or to examine how much of the waste could be composted. Put the waste that cannot be recycled or composted and has to go in the bin into a bag and weigh it. This can be used to examine the normal amount of waste that the class produces. Repeat the activity at regular intervals, however, be sure to send home information to parents about the Waste-Free Lunches, so that they know about what sorts of foods to include and what to avoid. Plot the progress on a chart. This links in nicely with Health Promoting Schools, because it is a way of encouraging pupils to eat more fruit and less processed snacks, which come with lots of packaging. A workshop on Waste-Free Lunches is available from the Council's Waste Management Unit.

Web links:
Visit www.wastefreelunches.org - an American site dedicated to waste free lunches or www.recyclenow.com and look under schools - reducing food waste.

Measure your Global Carbon Footprint

Schools Global Footprint is a teaching resource that The Highland Council supports which helps you measure and reduce the environmental effect your school has on the planet. To link to the Schools Global Footprint Tool (SGFT) go to:
www.ltscotland.org.uk/schoolsglobalfootprint

FACT BITE

A person living in the industrial world will consume 19 times more aluminium, 14 times more paper, 13 times more iron and steel, 10 times more energy, 6 times more meat and 3 times more fresh water than their fellow humans living in the developing world.
Source Earthscan, 1992

Reuse

The use of a product more than once in its same form, either for the same purpose or a different purpose.

Top Reuse Tips for School:

- Have a well labelled scrap paper tray in every room.
- You could shred paper to use as animal bedding, which could be given away or sold as an enterprise project.
- Encourage pupils and teachers to bring in waste-free packed lunches and snacks. This means using refillable food containers and bottles and avoiding over-packaged foods. Fruit and vegetables work well in a waste-free lunch, as any waste can be composted! Making up your own juice or squash from concentrate in a reusable bottle not only saves waste, but can save money too!
- Reuse envelopes – envelope reuse labels can help to cover up the previous address and reseal the envelope. They are available from many organisations such as Oxfam, Friends of the Earth, Trees for Life, Centre for Alternative Technology, World Wildlife Fund and Surfers Against Sewage to name but a few. Why not make your own using the school logo?
- Use rechargeable batteries.
- Reuse containers and packaging for creative craft activities!
- Reuse plastic containers such as yoghurt pots, margarine tubs etc. during art activities for glue and paint pots.
- Set up a collection for spectacles to donate to Vision Aid. Vision Aid is an organisation that sends unwanted spectacles to developing countries to be reused. Send with a note of the details of the spectacles to: Vision Aid Overseas, 12 The Bell Centre, Newton Road, Manor Royal, Crawley, West Sussex, RH10 2FZ. Website: www.vao.org.uk.

Top Reuse Tips for Home:

- Unwanted clothing and household items can be donated to your local charity shops so that they can be reused.
- Ask in your local shops if it is possible to get refillable products, such as ink cartridges, lighters and washing up liquid.
- Look out for bottles of fizzy drinks in returnable glass bottles.
- There are lots of alternatives to disposable items such as batteries, razors, nappies, sanitary protection, handkerchiefs, cleaning wipes and toiletries. For further information on reusable nappies contact Highland Real Nappy Project – Tel: 0845201 2609 e-mail: info@hrnp.org.uk or visit www.hrnp.org.uk

Reuse - Activities

Let's get Creative!

Gather together a range of objects that would regularly be regarded as rubbish, such as a pizza box, glass jars, advertising/unwanted CDs, plastic bottles, match boxes etc. Get the pupils into small groups where they can sit or stand in a circle and give each group an item of rubbish. They should pass the item around, taking it in turn to come up with an idea of how the item could be transformed and used again. Some good examples to get the imagination going would be: taking an old pizza box and decorating it to make a jewellery box, making a clock with an old CD as the face, using a glass jar to store marbles or other small bits and pieces. Suggestions can be for functional or decorative reuse. Let each group have a few minutes on each item of rubbish.

If you wish to take forward any craft projects, you can borrow some books about craft from scrap from the Council's Waste Management Team to help with ideas.

Make a trinket box from old packaging

Attractive boxes of various designs and for a multitude of uses can be made from cardboard and plastic packaging coated in a layer of papier mache. Decorate with coloured tissue applied with diluted PVA glue.

If you wish to take forward any craft projects, you can borrow some books about craft from scrap from the Council's Waste Management Team to help with ideas.

Real nappy maths

Work out how much it could cost to have a 'real' nappy baby versus a disposable nappy baby. Using the average figures below, what is the cheapest cost possible in which a family could clad a baby in disposable nappies? What is the most it could cost using disposable nappies? How cheaply could you clad a baby in washable 'real' nappies? What is the most expensive it could be to use washable nappies? What is the difference in cost for a second child, looking at the cheaper options for both disposable and 'real' nappies? The average number of nappy changes per day is 6. A child might stop wearing nappies between 24 months old and 36 months old.

Washable nappy costs:

Flat	£1.75 to £3.50 each
Shaped & One Size	£4.75 to £10.99 each
All-in-one	£7.90 to £14.50 each

Complete 'Birth to potty' nappy kits are also now available for around £250 - but as little as £150

Washing at home costs £1 per week taking into account washing powder, electricity and wear and tear on washing machine. One child would need 25 – 30 'real' nappies.

Disposable nappy costs:

The average cost of a disposable nappy is £0.20

There is now a growing on-line market in second hand real nappies. Users could recoup, say, 30% of the cost by selling them on when they have finished with them - or buying them second - hand so you could also add in this cost saving.
Useful information on comparative nappy costs:
www.clothnappytree.com
www.hrnp.org.uk
www.goreal.org.uk

Recycle

To process an item, in order to regain materials for remanufacture either as the same thing or as part of a different product.

In order to reduce our reliance on landfill and to ensure value is recovered from waste, the Council is working towards recycling or composting 50% of household waste by 2013 - the present figure is approaching 35%. By the summer of 2012 Kerbside Recycling will have been introduced throughout the Highland Council area.
The network of Recycling Points and Centres has also been improved and expanded to allow you to recycle more of your household waste. Full details of the Council's recycling services are available on www.highland.gov.uk. In addition to the Council's recycling services, there are other ways that you can send your waste to be recycled, some of which are listed below:

Top Recycle Tips for School:

- Use your kerbside recycling collection to recycle everything you can. By the summer of 2012 all schools in the Highland Council area will have blue mixed recycling bins for clean paper, cardboard, plastic bottles, food tins and drink cans.
- Compost your organic waste such as fruit peelings, tea bags and any garden waste. The compost that you make can be used to improve your soil.
- You can raise some money either for the school or for charity by recycling old mobile phones and ink cartridges. There are several organisations that you can do this with. One of these is Recycool. Visit www.recycool.org for more details.
- Consider composting your school's cooked food waste with a wormery.
- Collect used stamps and send to a charity.

Top Recycle Tips for Home:

- Make use of your nearest Recycling Points and Centres to recycle household items such as paper, drinks cans, food tins, textiles and glass.
- Recycle household batteries with some stores e.g., Currys, Dixons and PC World.
- Many charities collect coins, stamps and postcards – e.g. Guide Dogs for the Blind, Oxfam, The Royal National Institute for the Blind, Action Aid and The Leprosy Mission
- Recycle your ink cartridges and give them to a charitable cause. The selection to choose from includes: Friends of the Earth, Red Cross, Tommy's, SSPCA and WWF.
- You can recycle your old mobile phones and give to charity – e.g. Action Aid, Child Advocacy International, Scope, Highland Hospice, Oxfam, Help the Aged and Red Cross.
- Send your unwanted computer for reuse or recycling to Reboot in Forres, Moray – call 01309 671681.
  Also visit: www.computersforcharities.co.uk or www.itschoolsafrica.org
- Polyprint accept the plastic film that magazines etc may be packaged in: Polyprint Mailing Films, Mackintosh Road, Rackheath Industrial Estate, Rackheath,Norwich, NR13 6LJ.
- Unwanted CDs and DVDs not suitable for giving to charity shops can be recycled by companies such as: - Poly C Reclaimers - www.plasticwaste.co.uk - 0800 6191817.

Community Recycling

There are many active community groups in the Council area operating recycling, reuse and composting activities. To find out more about your nearest organisation, please contact the Community Recycling Network for Scotland Highlands and Islands Development Officer - www.crns.org.uk.

Recycle - Activities

Paper-making

You can borrow paper-making kits from the Council's Waste Management Team or you can look into making simple equipment yourself. There are a few ways which you can make your own - ranging from using an old picture frame, biscuit tin, or timber to create a frame, over which you need to stretch some fabric such as some curtain netting, tights or fine wire mesh. Once you have prepared your frame or 'mold and deckle', you need to prepare your paper and make a pulp. Tear up paper (no bigger than 4 x 4 cm) and place it in a bucket. Add 1/2 a litre of water for every 5 sheets of newspaper. Now you can either leave it to soak for a while to soften the paper, or you can go straight ahead to blending the paper with a liquidiser. Use a basin larger than your frame to hold the pulp mix.

Now you are ready to make a sheet of paper.

Dip the frame into the pulp and submerge it for 5 - 10 seconds. Lift it out of the bowl and let the water drain away from the mesh for a few seconds. Place a J-cloth over the mesh on top of the pulp and carefully tip the frame upside down and onto newspapers. Press down on the frame to allow the pulp to stick to the J-cloths then carefully lift off the frame. Leave it to dry overnight and you can remove the J-cloths from your newly made sheet of recycled paper. Petals, leaves and pressed flowers can be used to decorate the paper – just place them on the pulp on the frame before you place the J-cloth on top. Detailed instructions are supplied with the kits on loan, or visit www.bbc.co.uk/dna/h2g2/A839216

Rag rug making

You can borrow rag rug looms from the Highland Council's Waste Management Team, along with all you need to get started with weaving scrap fabric into rugs, seat cushions or wall-hangings. You will need to string the looms up for the pupils – instructions are available with the looms when you borrow them. Cut strips of fabric, which pupils can weave in and out of the wooden pegs. Once covered in fabric, the pegs can be lifted out of the block of wood and the fabric transferred onto the strings. The pegs can then be slotted back in again if more weaving is required to create the size of woven item that is desired. Detailed instructions are supplied with the kits on loan.

Research Project

Recycling reduces the demand for raw materials. This means less mining, quarrying or logging. Many parts of the world have been blighted by mining and quarrying, which destroys the natural environment and wildlife habitats and may cause environmental and health problems for local people. Also transporting raw materials around the world uses fossil fuels and has an environmental impact. Although some materials for recycling need to be transported around the UK, the impact of this is significantly less than that of transporting raw materials from often remote locations in other parts of the world. Split the class into groups and give each group one or two materials to find out where in the world they come from, and about the different habitats and wildlife that are native to those areas. Handy hint: The Peters Atlas will be useful for this available on loan).

On-line Resources

There are plenty of on-line recycling games and quizzes:

- www.ollierecycles.com/uk
  Visit the clubhouse for a rubbish sorting game.
- www.recyclezone.org.uk
  Visit the fun zone for games on recycling.
- www.recycle-more.co.uk
  Several games and activities are available on this site, split into ages 5-11 and 11-16.

Composting

Composting is Nature's way of Recycling!

By piling fruit and vegetable scraps and garden waste in a compost bin or heap, gardeners create an ideal habitat for decomposer organisms. These micro-organisms break organic material down to form humus. In addition, the heat inside the pile from all the biologic activity will kill off many diseases and unwanted seeds. Making compost requires turning, mixing and exposing the materials to air.

A kerbside collection of garden waste is available to 45% of Highland households at present, which is hoped to rise to 66% by the end of the year. This is for garden plant waste such as grass clippings, twigs, leaves, weeds, hedge trimmings, flowers and plants. It is collected in a normal refuse collection vehicle, and is taken to a composting facility, where it is shredded and heaped into a large pile. The pile is turned using a large machine called a loading shovel, to let air mix with the garden waste. This helps the waste to rot down. As it rots it gets up to temperatures as high as 60-70 Celsius and creates rich brown-coloured compost which can be used as a soil improver.

Home Composting

Did you know that up to 60% of the average household bin can be composted (including both garden waste and uncooked kitchen waste)? Composting is one of the simplest and best things that can be done to tackle the issue of waste. In landfill sites biodegradable materials rot down and give off the greenhouse gas methane. This is more potent than carbon dioxide, which is the gas that is created when these materials are composted. Because the recycling process takes place in situ it can drastically cut down on the amount of waste materials that have to be transported, saving on fuel. Home-made compost will improve your soil naturally, saving you money by reducing your need to buy compost. Composting can be carried out both at home and in the school grounds, using fruit peelings from packed lunches and snacks, tea-bags, paper towels, and garden waste such as fallen leaves and weeds. It is also important to know what sort of things NOT to compost – avoid adding cooked foods, meat and fish left-overs, cheese, coal ash, and cat and dog litter/poo.

To get good results with your compost, you need to put in the right mixture of materials – if you collect lots of tea-bags and fruit peelings from classrooms and the staffroom your compost maybe rather slimy! You need to make sure that you mix your 'browns' which are rich in carbon shredded paper, dried leaves, chopped woody stems, cardboard) with your 'greens' – nitrogen-rich materials such as grass clippings and fruit and vegetable food waste. In addition to adding the right materials, you should also introduce air into the compost, either by turning it using a fork, or by adding scrunched up paper and card, which act as air traps. Another aspect of your compost's wellbeing to look out for is the moisture content – like all things a balance is required between wet and dry. When compost is squeezed in your hand a few drops of water should be produced. If it is too wet cover it and add dry materials; if it is too dry add some water, or leave the lid off to let the rain in. Your compost heap will be home to lots of mini-beasts that help to breakdown the organic materials into compost. Keep an eye out for worms and other creatures living in the compost!

The Highland Council's Waste Awareness Team can offer advice on composting - and setting up a wormery. We can also bring a working wormery to your school to show to pupils - contact us on 01349 868439 or email: recycle@highland.gov.uk

Composting — Activities —

Home and School

Compost in a bottle

This is a great way to get a look at the composting process using empty 2-litre plastic drinks bottles as mini see-through composters. If you use one bottle between 5-6pupils, this should be enough. In preparation for this activity, you will need to cut off the top of the bottle but not completely –leave a small section to act as a hinge. You will also need:soil, scraps of newspaper, dried leaves and cut grass, fruit and vegetable peelings, as well as a permanent marker pen and Sello tape. An optional extra ingredient to use would be some fertiliser or compost accelerator, which you would add after a layer of vegetable scraps. This may speed up the process, however you will also get results without using this. Get the pupils to add a layer of soil in the bottom of their bottles about 2-3 cm deep. Next add a layer of vegetable scraps about the same depth and cover this with a thin layer of soil. Now add some dry leaves and grass, then another layer of vegetables and a layer of ripped up pieces of newspaper. If you wish to use a fertiliser/compost accelerator, add this after the layers of vegetable waste. Repeat this layering process until the bottle is full. Now close up the bottle and tape up the opening that you made. Mark the final level of compost with the marker pen. Create a prediction sheet with the pupils, where they make a diagram of the bottle and all its layers, and make a prediction about what they think will happen to the level at the top of the bottle over the next few weeks. The pupils should record the changes over the following weeks. While you would find mini-beasts in a normal compost heap, there is no need to add mini-beasts to this experiment. The conditions in the bottle may not be ideal for them, with less space and more light than some creatures may need. While mini-beasts are important in the composting process, the waste needs to have started to rot before they can digest it.
Bacteria and fungi, which are already present in the soil, will start to break the materials down during the experiment.

Mini-beasts and foodchains

Worms and other mini-beasts are very important in the composting process. If you wish to do further work on mini-beasts 'School's Out' by the Highland Environmental Network (HEN) has a mini-beasts section and is available at www.highlandenvironment.org.uk (go to projects then schools out)

School Grounds

If you start composting at your school, you may wish to look at other aspects of your school grounds to compliment this, such as a garden area where you can use the finished compost.

The following websites are good sources of information for composting and gardening in School Grounds:
The Growing Schools Garden - www.thegrowingschoolsgarden.org.uk
Grounds for Learning - www.gflscotland.org.uk
Highland Environmental Network (HEN) - www.highlandenvironment.org.uk.

Worm composting

Composting with worms is called vermin-composting. If your school is interested in setting up a wormery, the Waste Awareness Team is happy to help and to advise. Some books are available on loan with information about how to compost with worms and classroom activities relating to worms and composting. We can also arrange a visit to demonstrate a working wormery to pupils.

Web Resources

www.gardenorganic.org.uk/schools

Disposal

At present in the Highland Council area most of the waste that is not recycled is sent to a landfill site. However, a modern landfill is not just a hole in the ground which gets filled up with rubbish. It is lined at the bottom with clay and heavy sheets of plastic, which are then covered with sand or gravel so that the large vehicles which crush the rubbish don't puncture the liner. The reason that the landfill needs to be lined is because rainwater seeps through the rubbish and mixes with the waste, picking up substances, some of which could be harmful to the environment. This liquid, called leachate, needs to be prevented from leaking into soil or water. The leachate is collected and pumped to a treatment plant before it is discharged. The landfills are built up bit by bit, in sections called cells. When a cell is filled up it is topped off with a cap that stops any more rain getting into the waste and making more leachate. In addition to the liquid leachate, landfill sites also have gas waste, methane, which is produced as organic materials rot down. The Council landfill sites are operated in accordance with Pollution Prevention Control Permits enforced by the Scottish Environment Protection Agency (SEPA), which means that there are controls on leachate and methane gas management.

Relative lengths of time required for materials to decompose.

Paper	2-5 months
Orange peel	6 months
Milk Carton	5 years
Cigarette filter tips	10–12 years
Plastic bags	10–20 years
Leather shoes	25-40 years
Nylon cloth	30-40 years
Plastic containers	50-60 years
Polystyrene & glass	never

Source: www.dep.org.uk

Every day, lorries with rubbish arrive at the landfill site and waste is put into the active cell. Then it is compressed by a heavy vehicle called a toothed wheel compactor. Some of the materials will break down and decompose fairly quickly, whereas others will not.

Another option for waste disposal is the production of energy through the burning of waste, Energy from Waste (EfW). Household waste is made up of a number of different materials, some that will burn (combustible) – e.g. paper and kitchen waste- and some that won't burn (non-combustible) –e.g. tin cans and glass. Before burning, as much of the non-combustible material is recovered for recycling. However even with EfW there is still ash waste to be disposed of, so landfill is still required. Gasification, pyrolysis and anaerobic digestion are other technologies that can produce energy from waste. The first two technologies involve heating the waste to a very high temperature and using the gas produced to generate electricity. Anaerobic digestion is a naturally occurring process of decomposition that also produces gas that can then be used to produce energy. Mechanical Biological Treatment (MBT) is yet another form of waste treatment. This method has a mechanical element that extracts as much of the recyclable material from the waste as possible. The remaining waste is mostly biodegradable. This can then be composted (the biological element of the treatment) and used as a soil conditioner or made into pellets to be burned as a refuse derived fuel (RDF). All of the above methods are preferable to landfill as there is some kind of end product from the process, either energy or a soil conditioner.

Litter

Litter is described as waste in the wrong place and occurs when people fail to dispose of their waste responsibly. It is a crime to leave litter or to fly-tip with fines ranging from £25 - £20,000. Litter is expensive to deal with and it cost the Council £3.75 million in 2008/9 to keep Highland streets clean. It is also unsightly and if not dealt with can take many years to decompose. It is also dangerous - to people and animals. The Royal Society for the Prevention of Cruelty to Animals (RSPCA) staff regularly rescues pets and wild animals trapped or hurt by litter. This led to the introduction of the 'Lethal Litter' campaign. Another national campaign – Stop the Dumb Dumpers is also running, encouraging people to report fly tipping or any areas that need clearing up – telephone 0845 2304090.

Eco Schools Scotland have a topic sheet on litter with several links to other resources on litter –visit: www.ecoschoolsscotland.org.

Disposal — Activities —

Landfill Experiment

Get some clear containers with lids (e.g. take-away tubs) and half fill them with soil. Collect scraps of different sorts of materials, such as food, paper, plastic and metal. In each different container bury one of the materials, putting the scraps at the nearside of the container where they can be easily seen. Label each container with a note of which material is buried inside. Add some extra soil on top and moisten the soil. Leave some air space at the top of the container (about 3 cm). Observe the containers over at least a 3-week period. Make predictions about which materials will and will not decompose in a landfill. Then wait and see what happens to the materials in the containers, making notes on any changes.

	Week 1	Week 2	Week 3
Plastic - predicted			
Plastic - observed			
Paper - predicted			
Paper - observed			
Vegetables - predicted			
Vegetables - observed			

Litter Campaign

Hold a campaign to tackle litter in the school. Litter 'Clean it Up' packs may be available – visit www.ecoschoolsscotland.org to find out further details.

Role Play Debate

Not everyone wants to live next door to a landfill site or an Energy from Waste plant (Not In My Back Yard - NIMBY) However our waste must go somewhere for disposal. In the Highland Council area we have already filled up one of the landfill sites, and we need to do something so that we can deal with our waste in the future nearer to where it is produced. Organise a role play debate in which there is to be a Council meeting to discuss the issue of how to solve the problem of waste disposal locally. Different view points possible are: family, school, politician, environmentalist, local manufacturing company, and local tourist industry representative. Each role should receive a couple of sentences describing why they are interested in the issue and ways that it may affect them.

Use the table below which describes advantages and disadvantages of the two options for disposal.

Advantages	Disadvantages
Landfill	
It is relatively cheap and easy at the moment, although it is getting more expensive. Some of the gas produced in landfill sites can be used as energy. Landfill sites are usually existing holes in the ground resulting from activities such as quarrying.	When 'green waste' rots down it produces a very powerful greenhouse gas called methane. As water seeps through the waste, pollution (known as leachate) can be spread into the land and water nearby. Landfill sites fill up! More and more will be needed in the future, but where are we going to put them?
Energy from Waste	
It gets rid of lots of rubbish very quickly. The energy produced when the rubbish is burnt can be used to power other things.	The ash created needs to be buried, and can be polluting. Gases emitted need to be controlled and checked very carefully to reduce risk of pollution.

Glass

What is glass made from?

Glass is made from 3 raw materials – limestone, sand and soda ash. Soda ash is the chemical sodium carbonate, and is a natural grey/white powder. Limestone and sand are also natural materials, and are taken out from the ground from quarries. Quarries change the natural landscape and disturb local people through noise from explosions and the heavy lorries, which take away the rock and sand.

What happens to it?

Glass put into the bin will go to landfill, where it will never rot down. If you take your glass to a bottle bank, it will be taken to a recycling factory where it will be crushed and cleaned, and melted down and used to make new bottles and jars and also glass fibre insulation - which helps to keep buildings warm and save energy.

Where does it go?

Our glass is collected from all over the Highlands, and taken to Bonneting near Edinburgh to be recycled.

What about Reuse?

Jam jars make excellent pen pots, vases, storage containers and candle holders. Glass milk bottles from the milk delivery service are returned, washed out and used again as many as 40 times! Unfortunately, now there are less and less dairies providing milk in reusable glass bottles.

Glass Recycling Facts

- On average, every family in the UK consumes around 500 glass bottles and jars every year. This is about 8 percent of our waste (by weight).
- Sadly, five out of six glass bottles are thrown straight into the dustbin.
- The energy saved from recycling one glass bottle is enough to power a 100-watt light bulb for an hour, or power a computer for 25minutes.
- Recycling one glass bottle causes 20% less air pollution and 50% less water pollution than when a new bottle is made from raw materials.
- Glass can be recycled without any loss of quality again and again and again and again and again!

Further Resources

For more information and games visit:

British Glass - www.recyclingglass.co.uk - general information on glass, teacher's area and games.

Waste Online - www.wasteonline.org.uk - a glass information sheet.

Textiles

What are textiles?

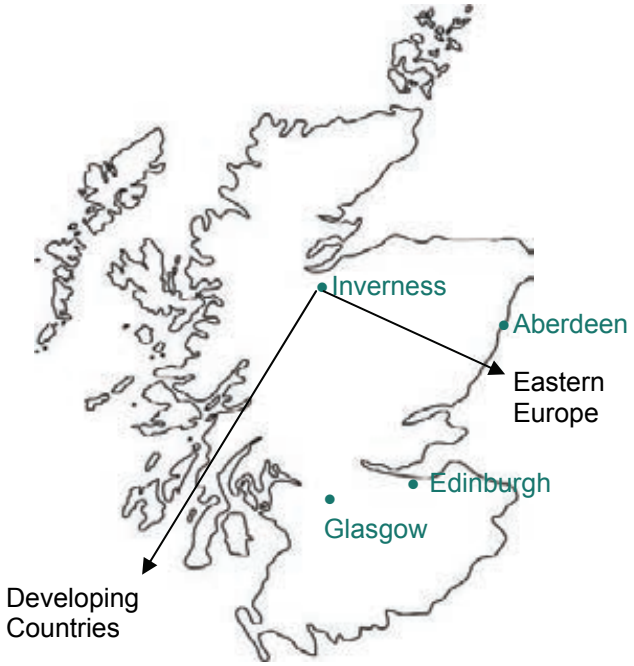
Textiles are natural or man-made fibres. Natural fibres are things like cotton, wool and silk. Man-made fibres include nylon, polyester and acrylic. The fibres are knitted, woven or bonded together to make textiles. Things made from textiles include our clothes, bedding, curtains, carpets, cleaning cloths and soft toys.

What happens to it?

Textiles that are put in the bin will be sent to landfill. While some of the natural materials will eventually break down, it may take several years before they even start to rot. Textiles which are collected for recycling from Council textile banks are sorted into different categories so that they can either be sold for reuse (e.g. sent to less well-developed countries) or recycled as sound-proofing or industrial cloth.

Where does it go?

Textiles from recycling banks in Highland are sorted at various locations in Scotland and beyond. Much of the clothing is sent to Eastern Europe and developing countries. As an alternative to using a textile bank, you can donate your waste textiles to a charity shop. The clothes will be sorted out, and the ones which can be worn again will be sold to raise money for the charity. You could also give them to a friend or take them to a jumble sale.



Textile Recycling Facts

- Textiles make up about 3% (by weight) of the average UK household bin.
- At least 50% of the textiles going to landfill are recyclable.
- If everyone in the UK bought one reclaimed woollen garment a year, it would save an
- average of 371 million gallons of water (the average UK reservoir holds about 300 million gallons) and 480 tonnes of chemical dyestuffs.
- Over 70% of the world's population use second hand clothes.

Further Resources

Waste Online - www.wasteonline.org.uk - a textiles information sheet.

Paper & Cardboard

What are Paper and Cardboard made from?

Paper and cardboard are made from cellulose fibre, most commonly pulped wood, although other organic, once living, materials can be used including rags, cotton, grasses, sugar cane, straw, waste paper and even elephant dung.
Think of all the things that are made of paper and cardboard: writing paper, exercise books, bus tickets, wrapping paper, newspapers, comics, magazines, cereal boxes, birthday cards, calendars, packaging around toys, electrical appliances and all sorts of other goods.

What happens to it?

When paper and cardboard are put in the refuse bin they are sent to landfill where they will rot and give off methane gas (remember they came from once living, organic material).
Paper and cardboard segregated for recycling is sent to a paper mill where it is chopped up and mixed with water to make a pulp slurry; ink and other materials such as clay and short fibres are removed. Paper fibres can be recycled 5-7 times before they become too short to be recycled again. Shorter fibres can be used to make card but longer fibres from new wood pulp are often added to improve strength for making finer paper.
The pulp slurry is sprayed onto a huge flat wire screen which is moving very quickly through the paper machine. Water drains out, and the fibres bond together. It is then pressed between rollers which squeeze out more water and compress it to make a smooth surface. Heated rollers dry the paper which is then slit into smaller rolls or cut into sheets.

Where does it go?

Paper and cardboard put into the blue recycling bins is sent to one of three Materials Recovery Facilities (MRFs) at Evanton, Perth and Grangemouth where is it separated into paper and cardboard, baled then sold on the world market – some will be reprocessed in Britain but some will be exported to other countries. The material from the 'paper only' banks at Recycling Points and Centres is of higher quality (which is why it is important that people don't put cardboard in these containers). It is transported to paper merchants who sell it to two paper mills in North Wales and North West England.
In Britain in 2010 nearly 46% of recovered paper was reprocessed in Britain, another 12% in other EU countries, about a third in China and the remaining 9% in other parts of the world.

Paper and Cardboard Recycling Facts

- On average, each household in the UK throws away 2-3 kg of newspaper and magazines each week.

- For every tonne of paper used for recycling the
- savings are: at least 30,000 litres of water, 3-4000 KWh electricity (enough for an average 3 bedroom house for a year) and 95% of air pollution.

- It is a common misconception that recycling waste paper saves trees. Trees for paper making are grown and harvested as a long term crop with new trees planted to replace those cut down. However, environmental problems can occur when old forests with many different species of trees and rich habitat for wildlife are replaced by managed conifer forests in order to meet the demand for paper.

- 12.5 million tonnes of paper and cardboard are used annually in the UK.

Further Resources

Waste Online - www.wasteonline.org.uk - a paper information sheet.

www.recycledpaper.org.uk - confederation of paper industries website with lots of information fact sheets about paper

Steel Cans

What is steel?

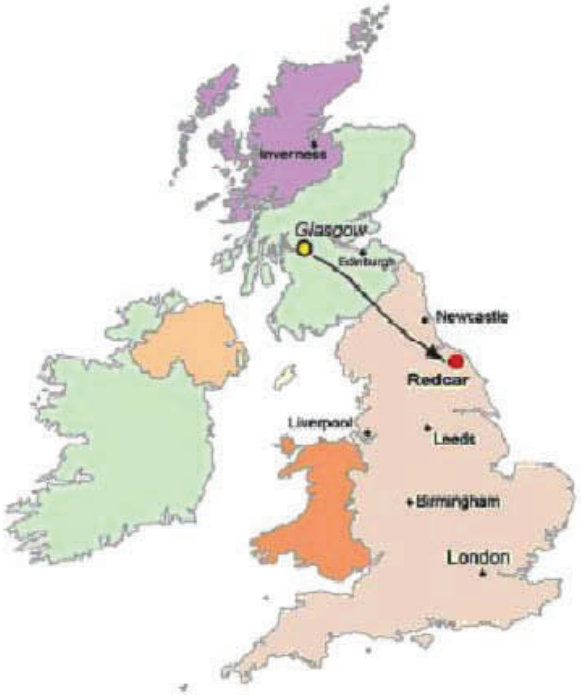
Steel is made from 3 main ingredients: iron ore from mines, limestone from quarries and lastly old, used steel. It is used for lots and lots of everyday things - most food and pet food cans, 1/3 of drinks cans, aerosols and paint cans, knives and forks, washing machines, cars, paper clips, bridges and lots, lots more!

What happens to it?

If steel is put in the bin it will go to landfill, where it may take hundreds of years before it rusts and disappears. Even then tiny bits of it will be left behind polluting the area. If steel is put in a can bank for recycling, it will first of all be separated from aluminium cans using a magnet (steel cans are magnetic and aluminium cans are not). The steel cans are then taken to a de-tinning plant where the tin lining is removed and saved for re-use. This tin lining is used to protect the steel from starting to rust, which would happen if the steel came into contact with the food in the can. The steel that's left is melted down to be used in making new steel.

Where does it go?

Steel cans from the can banks collections are taken to Invergordon where they are crushed and baled. They then go to Redcar in Teesside for reprocessing via a merchant in Glasgow. The cans from the mixed kerbside blue bin collections are separated from the other materials at a Materials Recovery Facility (MRF) and supplied to domestic, continental and world markets.



Steel Recycling Facts

- Steel cans have a very thin layer of tin that protects the surface of the can, which is why steel cans are often called "tins".
- Food and drinks cans (both aluminium & steel) make up about 2% of household waste.
- Every year in the UK we use 13 billion steel cans which, if placed end to end, would stretch to the moon three times over!
- Up to a quarter of every new steel can is made from recycled steel.
- Producing steel from recycled steel saves 75% of the energy needed to make it from raw materials.
- A 60-watt light bulb can be run for over a day by the energy saved from recycling ½ kg of steel (about 23 cans).
- Did you know that steel cans have been used for food packaging since 1810, when Nicholas Appert responded to Napoleon's challenge to invent a method of preserving food for the French army?

Further Resources

Steel Can Recycling Information Bureau - www.scrib.org - lots of information on steel cans e.g. the history of steel cans and recycling facts. There's a teacher zone where downloadable packs are available, with a list of other resources available (videos & cds). There is a children's zone with games and information.

Waste Online - www.wasteonline.org.uk - a metals information sheet.

Aluminium Cans

How is aluminium made?

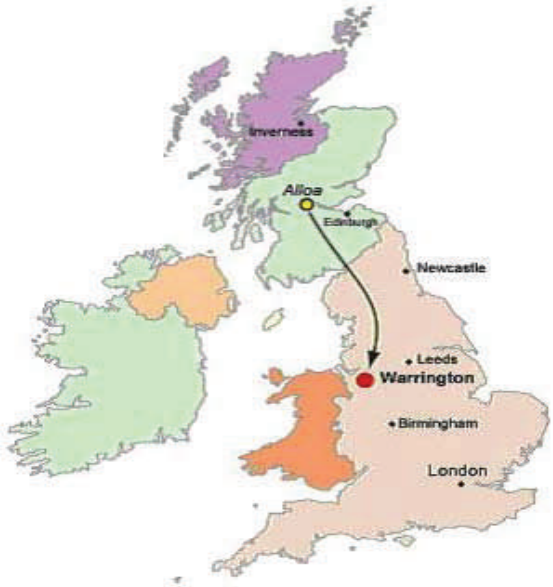
Aluminium is made from bauxite, which is dug out of the ground using big mechanical diggers. Bauxite is found mainly in tropical areas such as Australia, Brazil and West Africa. A white powdery material, called alumina, is removed from bauxite. The alumina is processed into silver coloured liquid aluminium. The aluminium is poured into moulds to make lumps called ingots which can be rolled or moulded into the shapes that are required. Aluminium has many uses: - drinks cans, door and window frames, cars and foil packaging.

What happens to it?

Aluminium that is put in the bin, will go to landfill where it may take hundreds of years before it disappears. Even then tiny bits of it will be left behind polluting the area. Aluminium cans that are placed in can banks for recycling are separated from the steel cans, (the steel cans are removed by a magnet). The cans are melted to make ingots, which are then used to make the required products. Aluminium can be recycled for an indefinite number of times and is used to make new cans and foil and other aluminium products.

Where does it go?

Aluminium cans from can banks are taken to Invergordon where they are crushed and baled. The bales are transported to a merchant in Alloa and then to an aluminium reprocessor in Warrington, England. The cans from the mixed kerbside blue bin collections are separated from the other materials at a Materials Recovery Facility (MRF) and supplied to domestic, continental and world markets.



Aluminium Recycling Facts

- The average annual consumption of aluminium cans in the UK is 1.5kg per person (about 90 cans) or 3.5 kg per household.
- Recycling aluminium can bring energy savings of up to 95% compared with making a can from raw materials.
- An aluminium can sent for recycling today can be made into a new can, filled and be back on the shelf in just six weeks.
- Aluminium can be recycled, without loss of quality, over and over again and again and again and again and again …
- Bauxite ore, which is a raw material used to make aluminium is mined in Australia, South America, China and India. Our recycled cans have made a much shorter journey!

Further Resources

Aluminium Packaging Recycling Organisation (Alupro)- www.alupro.org.uk – visit 'education' for downloadable resources and information about aluminium recycling.

Waste Online - www.wasteonline.org.uk - a metals information sheet.

Think Cans - www.thinkcans.com - downloadable worksheets and teachers notes.

Plastic Bottles

What is plastic made of?

Most plastic used in the world is made from oil; this is a fossil fuel which means it has taken millions of years to form and so is a non renewable resource – we can't replace what we use up in our lifetime. About 4% of the world's annual oil production is used as the raw material for making plastic and another 3-4% is used as energy in its manufacture.

Although over-use of plastic in packaging has become a big problem it does have uses. It is hygienic and very light – which helps to cut down on the environmental cost of transporting goods.

What happens to it?

Plastic put in the refuse bin will go to landfill where it can take hundreds of years to decompose. Plastic tends to be broken down by sunlight – which doesn't occur in a landfill site. Plastic subjected to sunlight in the ocean can break down in as little as a year, but releases toxic chemicals which end up in the guts of animals. Plastic litter on beaches has increased 135% since 1994. Seabirds mistake floating plastic litter for food, and over 90% of fulmars found dead around the North Sea have plastic in their stomachs.

Plastic bottles can now be recycled throughout The Highland Council area, either at most of the Recycling Centres or using the blue kerbside recycling wheelie bin services. The bottles are mostly made of two types of plastic: type 1 (PET) – e.g. water bottles and juice bottles - which can be turned into fleeces and other clothing; and type 2 (HDPE) – e.g. milk bottles and some detergent bottles – which can be made into items such as fencing, garden furniture, water butts, garden sheds and composters.

At present in the UK most plastic sorting is done by trained staff who manually sort plastics into the different polymers (types) and/or colour. Methods are being introduced to sort plastics automatically using laser technology. This will allow a wider range of plastic to be collected for recycling. Following sorting the plastic is either melted down directly and moulded into a new shape, or melted down after being shredded into flakes and then processed into granules.

Where does it go?

The plastic bottles are separated out at a Materials Recovery Facility (MRF) where they are baled up. They are then sold on the global market for re-processing into new products.

Plastic Recycling Facts

- We produce and use 20 times more plastic today than we did 50 years ago.
- Plastic packaging is the largest single use of plastic in the UK and accounts for about 35% of plastics consumption.
- A survey estimated that 24,000 tonnes of plastic bottles were collected in the UK in 2003 – but this amounted to only about 5.5% of all the plastic bottles sold!
- One tonne of plastic is the equivalent of 20,000 two litre drink bottles or 120,000 plastic bags.
- It takes 25 two litre plastic drink bottles to make one fleece garment.
- The amount of plastic waste generated annually in the UK is estimated to be nearly 3 million tonnes.
- About 56% of all plastic waste is used packaging, three-quarters of which is from households.

Further Resources

Waste Online - www.wasteonline.org.uk - a plastics information sheet.

Marine Conservation Society - www.mcsuk.org/what_we_do/Clean+seas+and+beaches/Litter+campaigns/Litter+campaigns

Plastic Oceans - http://www.plasticoceans.net/the-facts/what-a-waste/

Part 4 — Useful Resources

Web Resources

There are many resources available on waste and recycling – here we have focused on web-based resources, from which it is possible to either order or download additional packs for waste education in schools. There are a few Scottish sites providing waste education and several other UK sites where activities are referenced to the national curriculum in England and Wales. Some sites will contain games, quizzes and activities suitable for pupils to take part in online, as well as teacher zones with notes on activities.

General Waste Education and Information

Changeworks: www.changeworks.org.uk/schools/wasteprevention
Formerly LEEP (Lothian & Edinburgh Environmental Partnerships). There are some fun activities, downloads and fascinating facts on this site. Visits and talks are offered, however this only applies to the Edinburgh and Lothian area.

Community Recycling Network for Scotland: www.crns.org.uk
Organisation to support community recycling projects throughout Scotland, with contact details of local organisations.

Eco Schools: www.eco-schools.org.uk or www.ecoschoolsscotland.org
Information on the Eco Schools programme, which aims to get everyone in the school community involved in making the school environment better.

Finding out about packaging - www.incpen.org
On this site there is a downloadable resource book with information and activities referenced to the National Curriculum (England & Wales). There is also an interesting timeline showing key events in the history of packaging.

Mailing Preference Service: www.mpsonline.org.uk.
Stop unwanted mail.

Ollie Recycles: www.ollierecycles.com/uk
Lots of games, quizzes, puzzles and information. Ollie and his friends show you around and teach you more about the Three Rs (reduce, reuse and recycle). There is a teacher's area too, with some lesson ideas and information on Education for Sustainable Development.

Online Recycled Product Guide: www.recycledproducts.org.uk
Provides a national, comprehensive database of products made from recycled materials as well as suppliers of composting and recycling products. Find gifts and products for your home, garden or office. The site is owned and administered by WRAP.

Recycle More: www.recycle-more.co.uk
The awareness raising campaign in England and Wales. There's a schools section with games and information. Teachers can download resources for classroom activities with both primary and secondary children in the 'activities' section.

Recycle Now: www.recyclenow.com
There's a School section to this site with case studies and ideas on recycling in schools.

Recycle Zone: www.recyclezone.org.uk
A UK-wide site with information sheets, games and activities – set out in different zones – fun zone, info zone, teacher zone and so on..

Reuze: www.reuze.co.uk
A useful A-Z site with details for where more unusual items can be sent for recycling - describes itself as the 'how, what and where of recycling in the UK'.

SEPA Kids: www.sepakids.com
Scottish Environmental Protection Agency website for children. Here you can learn about what SEPA does to help protect the environment - and what you can do to help.

Waste Online: www.wasteonline.org.uk
In depth information on waste.

Waste Watch - www.wastewatch.org.uk
London based UK environmental charity with up to date website. Waste Watch 'shows what we can do to change the way we produce, buy, use and dispose of things'.

The Highland Council - www.highland.gov.uk
Information on services in the Highland Council area, with up to date details of recycling facilities and lots more information about waste and how to reduce it. Go to 'Waste Management' in the A-Z of Council Services; see also 'Sustainable Development'.

Waste-Free Lunches:
www.wastefreelunches.org
US resource on low waste lunches.

Recyclenow partners -
www.recyclenowpartners.org.uk
UK national website with links to regional sites; schools pages with fun section for kids and downloadable resources and lesson plans for teachers at both primary and secondary level.

Waste Watch - www.wastewatch.org.uk
London based UK environmental charity with up to date website. Waste Watch 'shows what we can do to change the way we produce, buy, use and dispose of things'.

Zero Waste Scotland:
www.zerowastescotland.org.uk
Information on recycling and other waste reduction campaigns and issues across Scotland.

WRAP (Waste & Resources Action Programme)
www.wrap.org.uk
WRAP (Waste & Resources Action Programme) works in England, Scotland, Wales and Northern Ireland to help businesses and individuals reap the benefits of reducing waste, develop sustainable products and use resources in an efficient way.

General Environmental Education and Education for Sustainable Development

Concrete2cookers -
www.concrete2cookers.org.uk
concrete2cookers is an educational game for late primary and early secondary school children developed by Heriot-Watt university. By interactively exploring a school building they can learn about the steps they can take to reduce their school's carbon footprint.

Schools Global Footprint
www.ltscotland.org.uk/schoolsglobalfootprint
Schools Global Footprint is a teaching resource, that The Highland Council supports, which helps you measure and reduce the environmental effect your school has on the planet.

Environment for Young Europeans:
http://ec.europa.eu/environment/climat/campaign/control/takecontrol_en.htm
Information, quizzes, games and video clips on the theme of Climate Change and how we can help stop it.

Highland Environmental Network:
www.highlandenvironment.org.uk
HEN is a Regional Environmental Education Forum (REEF) for the Highland Council area. The aim of HEN is to raise awareness and involvement in environmental matters. HEN produces a quarterly newsletter, “An Arainneachd” and hosts an annual conference. On the website is the educational resource “School’s Out”, which includes a section on mini beasts and waste.

Learning & Teaching Scotland Sustainable Development:
www.ltscotland.org.uk/sustainabledevelopment
This website provides advice, support, resources and staff development to the education community in Scotland; includes a large excellent section on sustainable development and a Climate Change calendar - in both English and Gaelic.

US Environmental Protection Agency:
http://idahoptv.org/dialogue4kids/season6/garbage/links.cfm
Waste education resources from the US Environmental Protection Agency, including Recycle City, in which you explore how an imaginary town has restored itself from Dumptown to Recycle City.

WWF’s education site: www.wwf.org.uk/what_we_do/working_with_schools
The WWF’s ‘One Planet Schools’ project provides information, encouragement and inspiration for schools working to put sustainability issues at the heart of school life.

Recycling Schemes

Computer Recycling
http://www.reboot-forres.co.uk
ReBoot Moray Computer Recycling is a local company with charitable status which provides high quality low-price refurbished computers. See a link to a Highland Council press release below
http://www.highland.gov.uk/yourcouncil/news/newsreleases/2011/December/2011-12-30-01.htm

I.T Schools Africa: www.itschoolsafrica.org
IT Schools Africa is a UK-based charity which delivers recycled computers to African schools to improve education and cross-cultural communication.

Poly C Reclaimers: www.plasticwaste.co.uk
CD and DVD recycling.

Recycool: www.recycool.org
Ink cartridge and mobile phone recycling scheme with competitions and teacher resources.

Materials for Recycling

Alupro: www.alupro.org.uk
Information on recycling aluminium. Alupro is currently developing new resources for schools which will be available for the academic year 2012-13.

British Glass: www.recyclingglass.co.uk
Find out about the history of glass and how and where it is made. There is a teacher's area –where you can order a free CD – ROM and there are also games.

Steel Can Recycling Information Bureau: www.scrib.org.uk
Lots of information on steel cans e.g. the history of steel cans and recycling facts. There's a teacher zone where downloadable packs are available, with a list of other resources available (videos & cds). There is a children's zone with games and information.

Think Cans: www.thinkcans.com
Games and downloadable teacher resources for Key Stages 1-4.

Compost and School Grounds

Grounds for Learning Scotland: www.gflscotland.org.uk
Helping schools and early years settings use and develop their grounds.

Growing Schools Programme: www.thegrowingschoolsgarden.org.uk
Since 2001, Growing Schools has been encouraging and helping teachers to use the outdoor classroom as a resource across the curriculum for pupils of all ages and abilities.

Schools Organic Network: http://www.gardenorganic.org.uk/schools_organic_network/learning_zone/beans.php
Information on making compost, and also using it in an organic garden. There is also a Fun Zone with online quizzes and word searches.

The Adventures of Herman the Worm: www.urbanext.uiuc.edu/worms
An American site with useful info on worms for worm composting projects.

"Real" Nappies

Highland Real Nappy Project: www.hrnp.org.uk
Local 'real' washable nappy campaign.

Women's Environmental Network: www.wen.org.uk
Covers many issues from organic food growing and food waste to fuel poverty, real nappies and sanitary protection.

Go Real: www.goreal.org.uk
Historically known as the Real Nappy Campaign, Go Real is now independently run by a Cornish based social enterprise by parents who have had first hand experience bringing children up in real nappies. Site contains lots of information, facts, tips and a nappy finding service.

Teaching Resources

Carleton College Teaching Geoscience: http://serc.carleton.edu/introgeo/roleplaying/howto.html
Teaching role play resources.

Everything Preschool: www.everythingpreschool.com
An American site with songs, games and activities covering many themes for pre school age children, including recycling and worms.

recycle for Scotland
ath-chuairtich airson Alba

The Highland Council
Comhairle na Gàidhealtachd

Don't let a good thing go to waste
Na leig rud math a dhìth

For further information contact the Waste Awareness Team

☎01349 886603 ✉ recycle@highland.gov.uk

www.highland.gov.uk