

WASTE

Teachers' Notes

Waste or Resource?

→ REDUCE, REUSE, RECYCLE

Goals of the module

This module is about waste—the amount of waste we create; throwing things away; recycling, litter; and where all the waste goes. It will help to teach students about what happens to waste, how much we create and what could be done to improve the situation through less waste generation and more reuse and recycling. The approach is one of exploration and creativity, with students observing their own habits, counting waste, and thinking about what could be reused or how waste can be avoided in the first place. It will familiarise students with some of the concepts behind what is possibly Ireland's most pressing environmental problem. Minimising waste, recycling and making full use of limited natural resources are all core parts of becoming environmentally aware and reducing our negative impact on the Earth.

Curriculum links

The main curriculum link for this module is the Environmental awareness and care strand of SESE, Science and Geography. The activities also relate to other SESE strand units such as Properties and characteristics of materials

(recognise that some materials decay naturally while others survive a long time in the environment) and Science and the environment (recognise and investigate the aspects of human activities that may have positive or adverse effects on environments), and connect to other subjects such as Maths, History and Drama.

Overview of the topic

When we read about waste, the word 'crisis' will soon appear. People are now realising that we cannot afford to create more and more waste, nor can we simply bury it and forget about it. On the other hand, many people find recycling facilities difficult to access and packaged goods hard to avoid, and many have fears

about living near landfills or waste incinerators.

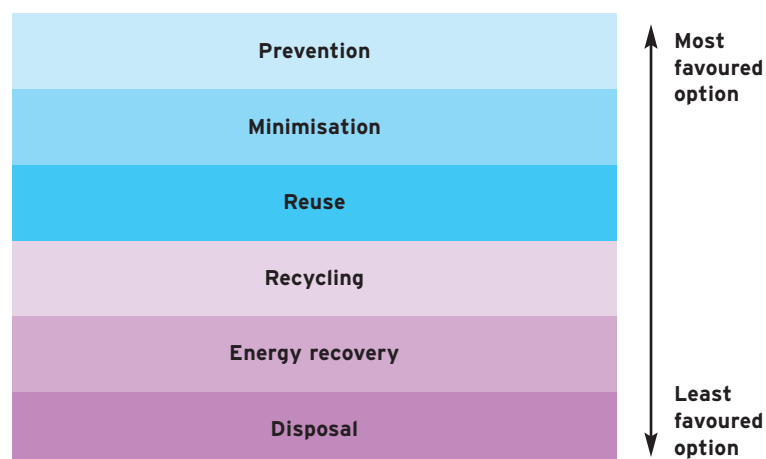
Prevent and minimise

This can mean factories redesigning products to use less materials, or offices communicating by e-mail instead of letters. For most people, the most visible issue here is packaging. Does that item need three layers of plastic around it?

Reuse

If a bottle is melted down and made into a new glass product, this is recycling. But could the bottle simply be washed and reused in its present form? This uses far less energy and materials. Why is this so rare now? This module focuses on reuse as an option to be considered in preference to recycling where possible.

Irish waste policy is based on the idea of the waste hierarchy



WASTE

Teachers' Notes

Continued →

Recycle

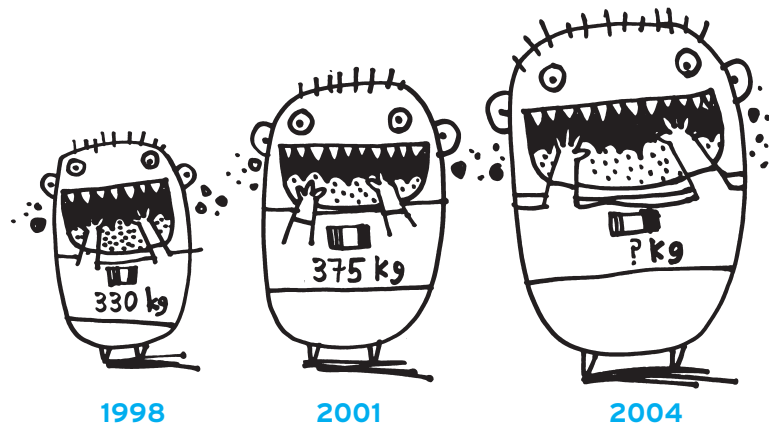
Many materials cannot be reused, but they can be reprocessed and recycled—paper is pulped and made into new paper, waste glass is made into new glass bottles. By international standards our recycling rates are still low, and we have ambitious national targets for improvement.

Energy recovery

Incineration provokes widespread concern about the environment and our health. However, the counter argument is that proper, safe thermal treatment reduces the amount of material going to landfill and also generates energy to replace fossil fuel use, thus having wider environmental benefits. Opinion is divided and the debate is far from closed. Government policy is in favour of the thermal treatment of waste as one component of a wider waste management strategy.

Dispose

This should be the last resort, and as little material as possible should be involved. When disposal is necessary it should be managed to the highest standards to avoid the risk of pollution and interference with local communities. There have been bad experiences in the past, but modern landfill sites are highly controlled, precise operations and represent a big improvement.



Waste generated per person in Ireland is growing steadily. For every man, woman and child in Ireland, 375 kilograms of waste was produced in 2001. How many times the typical weight of a child in your class is that?

How much is there?

Waste generated per person in Ireland is growing steadily:

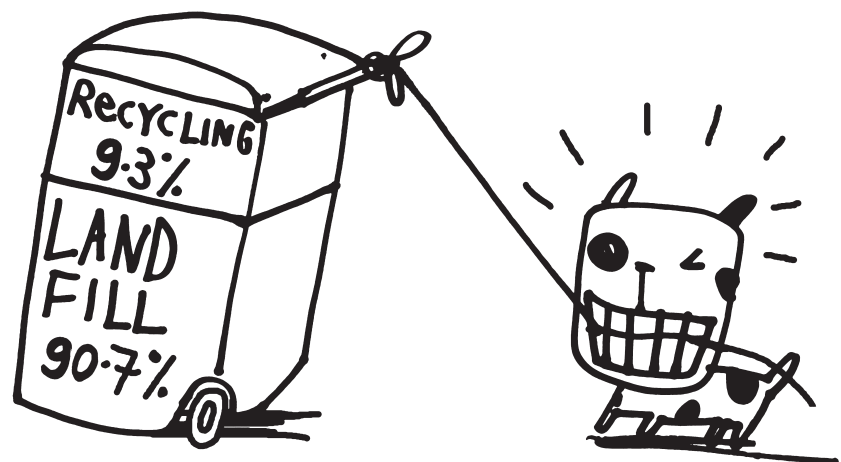
1998: 330 kg

2001: 375 kg

For every man, woman and child in Ireland, 375 kilograms of waste was produced in 2001. How many times the typical weight of a child in your class is that?

What happens to it?

Recycling rates are improving, particularly for commercial packaging waste. Recycling of household waste remains low at 5.6% in 2001. However, recent data shows that rates are climbing: the recycling rate for 2002 was 9.3%. In 2003, 42% of households were segregating at least some of their waste, which suggests more recycling is now happening.

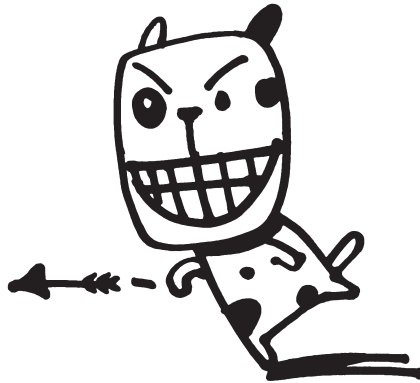


In 2002, 9.3% of household waste produced in Ireland was recycled: the rest, 90.7%, went to landfill.

WASTE

Teachers' Notes

Continued →

**What are the targets?**

The deadline for significant improvements in Irish waste management is 2013, by which time we should be:

- Diverting 50% of household waste from landfill (mainly into recycling and composting)
- Recycling 35% of municipal waste

So far, progress is good in many areas. The availability of recycling facilities is key to the management of household waste, and emphasis is being placed on providing more bring centres and making it easier for people to recycle.

What can students do?

A table is provided in Waste Activity 1, 'What's in your bin?' outlining how we can reduce, reuse and recycle a range of materials. It may be useful to review this at the outset.

Reduce Most homes and schools could set up a compost bin or wormery for food scraps. Local authorities usually offer compost bins at low prices and will give guidance on how to use them and what can be put in. It is amazing how much the amount of waste in your bin each week will be reduced if you start composting! This module also focuses on packaging, and encourages students to consider this when making choices about what to buy. Demand from customers may encourage suppliers to change the way they package things.

The plastic bag levy of 15 cent per bag encouraged people to stop and think before simply taking disposable plastic bags to pack their shopping. Most people are now in the habit of bringing reusable bags and thus the waste and litter caused by plastic bags is reduced. Shops now give out less than one tenth the number of plastic bags they did before the levy was introduced.

Reuse While much of the discussion on waste focuses on recycling, reuse is nearly always better (using less energy and materials than recycling) and should be considered whenever possible. In this module, children look at creative ways to reuse. Even when some of the ideas are of limited practicality, encouraging children to think about reuse will help them to realise how wasteful much of our current use and disposal of materials is.

Since the plastic bag levy started, a huge variety of reusable shopping carriers have become available including durable plastic, cloth and paper bags and crates. Even normal disposable plastic bags can be reused many times until they wear out, and people realise that they save money by reusing bags.

Recycle Most children are conscious of recycling these days—many have better habits than adults! Talking about how recycling happens and what can and can't be recycled is a good opportunity to turn this behaviour into wider awareness. According to Ireland's Environment 2004 there will soon be nearly 2000 bring centres in Ireland, double the number in 1998. Recycling is now easier and will eventually become the norm.

WASTE

Teachers' Notes

Continued →

Shabra Plastics, Carrickmacross, County Monaghan

Shabra Plastics makes plastic bags by recycling Irish plastic waste. Over 70% of its raw material is recycled plastic. The company also offers to collect waste plastic from its customers, forming a closed circle where plastic is used as packaging and then returned for recycling into new products.

Wellman International, Mullagh, County Cavan

Wellman International manufactures polyester and nylon fibre for use in the textile industry, for example as insulation in jackets. Wellman International uses plastic bottles from household collection systems throughout Europe as a raw material. Every day Wellman International at Mullagh recycles roughly 5 million bottles.

Where to go for more information

Irish facts and figures, policy and targets

Ireland's Environment 2004
(available at www.epa.ie)

Also www.raceagainstwaste.com

On where to recycle

Information from Repak,
(www.repak.ie, Tel: 1850 950999)
and also www.irelandrecycling.ie

Some good educational sites

- www.blackrock-edu.ie
click Environment
- www.iwt.ie
click IWT projects, then click
City Learning Naturally
- www.enfo.ie
click Schools and Teachers,
then click Teaching Aids for
information
- www.ipcc.ie Homepage
- www.scoilnet.ie
click Students and Science—
this site has a good online web
library and worksheets

WASTE

Teachers' Notes

Continued →

**The waste pack–
content overview**

Please note: teachers and students should always wear rubber or plastic gloves when handling waste.

**1. What's in your bin?
Reduce, Reuse Recycle**

This activity is a great introduction to the topic of waste, getting pupils thinking about all the things we throw out, the amounts involved, and asking them to explore ideas for reduction, reuse and recycling. The teacher assembles a 'clean' bin of typical waste items and uses it to start the discussion on waste.

Theme Demonstration (D)

Curricular Strands

SESE Science–Materials; Properties and characteristics of materials; Science and the environment

SESE Science and Geography–Environmental awareness and care

Skills Questioning, observing, predicting, sorting, classifying and recognising patterns

Time 35 minutes

**2. A juicy graph–
Counting waste**

Pupils collect and rinse juice or milk cartons (tetrapak) and use these to build a 3D graph of the amount of cartons used on a daily and weekly basis. This illustrates

visually the amount of carton waste and links well to surveying, counting and graphing skills.

Theme Class activity (CA)

Curricular Strands

SESE Science–Materials; Properties and characteristics of materials

SESE Science and Geography–Environmental awareness and care
Maths–Data; Numbers; Shapes and space

Skills Questioning, observing, predicting, sorting, classifying, recognising patterns, recording and communicating

Time 30 minute introduction and 10–15 minutes each day collecting and rinsing cartons to build the graph; 20–30 minutes for questions at the end of the exercise

**3. What a waste! A day in the
life of Catherine Kelly**

As an introduction to some of the concepts addressed in the rest of this module, students think about the word 'waste' and consider what it means and how it is used. This is approached through a story of a day in the life of a typical Irish girl.

Theme Class activity (CA), Demonstration (D)

Curricular Strands

SESE Science–Science and environment

SESE Science and Geography–Environmental awareness and care

English–Developing cognitive abilities through oral language; Emotional and imaginative development through language; Reading; Developing interests, attitudes, information retrieval skills and the ability to think

Skills Questioning, recording and communicating

Time 10–15 minutes for the concept map; 20 minutes for the story and questions

4. Food for thought–Investigating biodegradable waste from a family meal

Students investigate the amount of biodegradable or organic waste generated while preparing an average family dinner. Alternatively, if students use the bins in the school to dispose of leftover food, these could be the focus, though this will be messier!

Students gain a better understanding of how much biodegradable waste is produced at home or at school and start to consider ways to reduce it. There are also opportunities for using maths skills to move from the investigation to a more general estimate of waste generated.

Theme Class activity (CA)

Curricular Strands

SESE Science–Materials; Properties and characteristics of materials; Science and the environment

WASTE

Teachers' Notes

Continued →

SESE Science and Geography–
Environmental awareness and care
Maths–Multiplication; Weight

Skills Questioning, observing,
predicting, estimating
and measuring, recording and
communicating

Time 10 minute introduction;
30 minutes preparing, weighing
and calculating

5. Rot or not? Investigating biodegradable and non-biodegradable waste

An investigation based on bury-
ing various waste items and
monitoring them over time to
see which rot quickly and which
remain intact. Students will dis-
cuss and learn about how we
deal with most of our waste and
how this affects the environment.

Theme Class activity (CA)

Curricular Strands

SESE Science–Materials;
Properties and characteristics
of materials; Science and the
environment
SESE Science and Geography–
Environmental awareness and care

Skills Questioning, observing,
predicting, investigating and
experimenting, recording and
communicating

Time 30 minute introduction;
20–30 minutes on predictions;
10–30 minutes burying the waste
depending on whether the holes
are prepared in advance or not;

20 minutes to check on waste
after two weeks and again after
a month

6. Fan of wrap? Investigating packaging waste

Students examine the amounts
and types of packaging waste
from a range of typical items
from the shopping. Recording and
discussing looks at packaging and
the amounts of waste created.

Theme Class activity (CA)

Curricular Strands

SESE Science–Materials;
Properties and characteristics
of materials
SESE Science and Geography–
Environmental awareness and care

Skills Questioning, observing,
predicting, investigating,
sorting, classifying, recording
and communicating

Time 10 minutes the day before;
10 minutes for the introductory
activity; 20–30 minutes to com-
plete the survey; 10 minutes for
questions and discussion

7. Expedition! Back to the Future

This drama activity involves
pupils imagining they are explor-
ers in the year 3004. They come
across an ancient rubbish dump
from a thousand years ago. What
could all these strange objects
be? What were they used for?
The game gets children thinking

about all the things we throw
away and what else they might be
used for.

Theme Drama (Dr)/Role play (RP)

Curricular Strands

SESE Science and Geography–
Environmental awareness and care
English–Emotional and
imaginative development through
language
Drama–To explore feelings,
knowledge and ideas, leading to
understanding

Skills Questioning; cooperating
and communicating; creative
thinking; exploring feelings,
knowledge and ideas leading to
understanding

Time 40 minutes (or longer if
desired)

8. Making compost

This is a step-by-step guide to
making and using your own
compost including advice on
choosing and positioning contain-
ers, what can and cannot be
composted, and when and how
to use the compost. From the
ECO-UNESCO pack 'Protecting
your Local Environment', used by
kind permission.