

Lesson Plan 5 - Understanding Packaging Design in Modern Society



Objective

To demonstrate to pupils the necessity for a variety of packaging in modern society and the challenges of managing the associated waste streams.

Activity

Examine product packaging and determine whether it is recyclable and also whether the packaging for the product is excessive.

Curriculum Links

Curriculum Links Key Stage 2 Design & Technology

Pupils should be taught to:

3c) Recognise that the quality of a product depends on how well it is made and how well it meets its intended purpose (for example, how well products meet social, economic and environmental considerations).

Mathematics

Pupils should be taught to:

2f) recognise the equivalence between the decimal and fraction forms of one half, quarters, tenths and hundredths; understand that 'percentage' means the 'number of parts per 100' and that it can be used for comparisons; find percentages of whole number quantities, using a calculator where appropriate

QCA Links

Science Key stages 1 & 2

Unit 1C – Sorting & using materials

Unit 3C – Characteristics of materials

Design & Technology Key stages 1 & 2

Unit 3A – Packaging

Mathematics

Unit 5 – Fractions, decimals

PRACTICAL ACTIVITY

Planning required for activity

Apparatus Required






Kitchen Scales

Calculators

Packaging example

Each pupil requires a piece of packaging used to contain food or drink. It should be empty, clean and still have any labels on. The lids and caps to the containers should also be brought in. (The teachers should also bring some containers as examples and extras if required). There should be examples of different materials used for packaging

Activity Procedure

1. The teacher should prepare copies of the Understanding Packaging Table 
2. The class should be separated into several groups according to the types of material they have brought in to class e.g. cans, plastic wrapper, plastic bottles, glass containers etc 
3. Each group should now examine their containers and determine the weight of the product that was in the packaging. The net weight written on the label will represent the contents only. Liquid contents should be calculated on the assumption that 1 litre = 1kg 
4. The individual packages should be weighed on the scales. 
5. Data should be recorded on the Understanding Packaging Table 

6. The percentage of packaging for each individual product should be calculated using the following formula:

$$\frac{\text{Packaging Weight (A)}}{\text{Total Weight of product (C)}} \times 100 = \text{Percentage of Packaging (D)}$$

Once all of the individual packages have been weighed each group should calculate the average percentage of packaging for their group using the following formula:

$$\text{Average percentage of packaging for material} = \frac{\text{Sum of percentages in column D}}{\text{Number of individual packages}}$$

7. The results should be displayed for each group on the board.



Key questions for the class to answer

1. Which of the packaging materials represents the smallest percentage of the overall weight of the product?
2. What are the advantages of the various different types of packaging?
3. Did any of the packaging seem excessive for what it contained, in volume and weight?
4. Are some products contained in a number of different materials?

Each pupil should now be asked to see if they have a recycling symbol on their packaging.

5. What does recyclable mean?
6. Which of the packaging used is made from recycled material?
7. Is there any packaging that can be recycled but does not have a symbol?
8. Could any of the packaging looked at be reused?

Discuss with the class how we can reduce the waste from packaging?

Here are some suggestions to help reduce the waste occurring from packaging:

- Buy products with less packaging.
- Buy products with no packaging.
- Buy products in bulk
- Buy products that have refillable containers.
- Buy products that have packaging that can be reused for other purposes.
- Buy products made from recyclable material or made from material that is recyclable.

THE HISTORY OF WASTE AND PACKAGING

TIME LINE

Cave dwellers
4000 BC?



Farmers 3000BC?



First Outbreak of Black
Death 1348 leading to
the introduction of first
waste collections



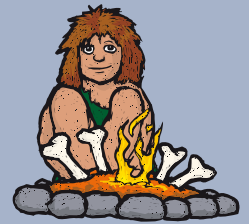
1408 Legislation to
prevent the build up
of waste



1700's Industrial
Revolution leads to
growth in towns



Early cave dwellers and hunter-gatherers did not create much waste. They would have had bones from animals they had eaten, vegetable scraps and ash from the fire. All of these materials eventually decompose creating a more fertile soil



The hunter-gatherers gave way to farmers. Since populations at this time remained very small waste did not cause a problem. People would eat the crops that they grew and eat the animals that they reared

As populations grew people began to live closer together making communities. They needed ways to deal with the waste that was being generated. They fed vegetable scraps to the animals and then manure and green waste were used on the fields as fertiliser to help next season's crops

The problems with waste grew as populations increased slowly moving away from the countryside to form large cities

The effects of poor waste management culminated in the 14th century. London saw the streets littered with rotting food and sewage. This resulted in an increase in vermin and disease. The hazards of the unhygienic environment soon became apparent with the first outbreak of the plague, known as 'The Black Death' in 1348



Populations continued to increase; consumption and demand for produce also grew. Although reuse and recycling existed the amount of waste being generated began to prove to be more of a problem

In 1408 Henry IV passed a ruling that household rubbish should be kept inside until the 'rakers' took it away. The 'rakers' carted the rubbish to outside the city gates or took it down to the river where it was piled onto boats and taken away¹



The eighteenth century saw the industrial revolution; the amount of goods produced and consumption increased rapidly with the advent of machinery. People moved to towns for employment. The usual methods of feeding rubbish to the animals that worked so well in the country didn't work in towns and the rubbish piled up in the streets. Scavengers went through the rubbish and sold what they could find including bits of wood, coal, rags and bones. There were even people that worked in the sewers picking through the waste where they might find coins, jewellery, metal, rope and bones¹

Dustmen originated from the need to remove the ashes from the fires that everyone burnt. There was no central heating at this time and most fires burnt coal. The dustmen emptied the dustbins on to a horse drawn cart. These were then taken to a dust yard and sorted through, any valuable items were taken out and sold

1848 First landfills in Britain

1848 saw the introduction of the Public Health Act. This introduced the first landfills to Britain, which were known as 'midden heaps'. These were holes in the ground located close to the houses²



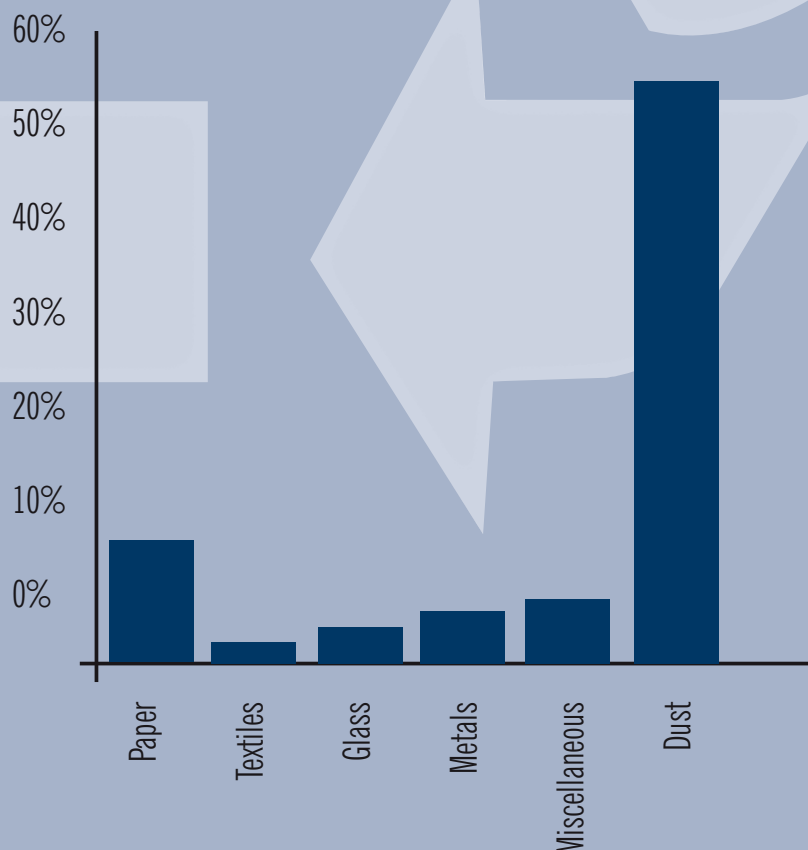
Council collections of rubbish begin

The 1875 Public Health Act was brought in and made local authorities responsible for the collection and disposal of waste. This was the start of the system we have today

Rubbish is mainly burnt in household fires

In the 1930's, Britain's people were encouraged to burn their rubbish with the slogan "Burn your refuse - reduce your rates" written on the side of the rubbish vehicles. Rags, metals and glass were collected and were used in recycling schemes¹. This decade also saw the first plastics made³

The contents of a 1930's dustbin (source: Waste Watch)



1952 The Great Smog hits London



On Friday 5 December 1952 a dense smoke-filled fog shrouded London and it hung over the city for the next four days. London came to a standstill. Over 4,000 people died, motor vehicles were abandoned, trains were disrupted and airports were forced to close⁴



1956 Clean Air act was introduced to stop people burning rubbish

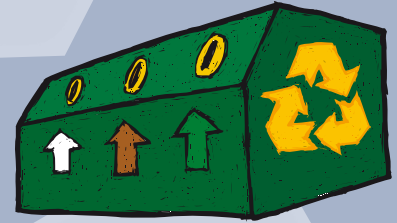


In 1956 the Clean Air Act was passed leading to a decline in the number of open fires, these being replaced by central heating fuelled by gas, oil and electricity. During the 1950's there was an economic boom, which resulted in a rapid increase in production and consumption.³ The distance products travelled before being purchased increased and this resulted in an increased need for packaging to protect the goods

1970's throwaway society begins
1977 first glass bottle bank introduced in UK



The 1970's saw a massive increase in convenience food which required a great deal of packaging. People also began to expect goods to be available all year round. Electric and electronic goods began to be replaced more and more regularly. The demands by an ever growing population for consumables meant that the amount of rubbish going to landfill increased

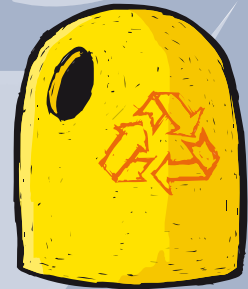


In 1990 the Environmental Protection Act was passed. This required anybody dealing with waste to handle it in a safe manner. The Landfill Tax was introduced in 1996 increasing the cost of disposal with the aim of encouraging reuse and recycling
In 1997 Producer Responsibility Obligations (Packaging Waste) Regulations were passed, which meant that large businesses had to recover and recycle packaging waste

2000 Legislation introduced forcing councils to increase recycling in the UK



The National Waste Strategy was produced in 2000 setting recycling and recovery targets for local authorities to achieve. This has resulted in kerbside collections of recyclable materials and waste awareness promotion to encourage as many people as possible to recycle

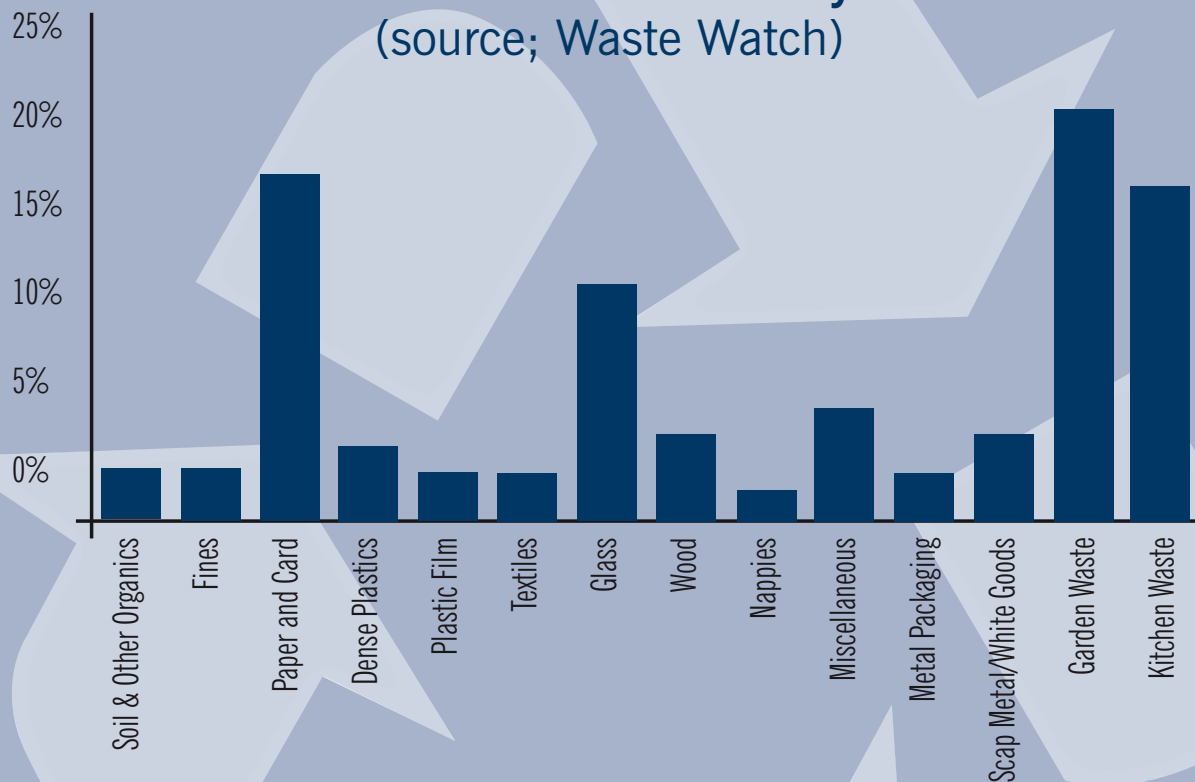


Leicestershire authorities are required by the Government to set out how they plan to manage waste across the county. The Leicestershire Waste Management Partnership consisting of Leicestershire County Council and the seven District and Borough Councils of Blaby, Charnwood, Harborough, Hinckley & Bosworth, Melton, North West Leicestershire and Oadby & Wigston produced a Waste Management Strategy in 2002. This Strategy was driven by the need to meet recycling targets set by the Government. Since that time, the Partnership has made significant progress, and all the Districts and the County Council met their targets achieving some of the highest recycling rates in the country.

Over the next 15 years the Government has set challenging targets for Leicestershire to decrease the amount of biodegradable waste disposed of in landfill sites. Largely in response to these new targets, the Waste Management Partnership is reviewing its Strategy and the new Strategy will be adopted in 2006.

For further details, please contact the Leicestershire Waste Management Partnership on 0116 265 6837 or visit www.lesswaste.org.uk.

The contents of a 21st Century dustbin (source; Waste Watch)



References

- 1 Project Integra – A history of Waste
- 2 Learn.co.uk from the Guardian
- 3 Wasteonline – Waste Watch
- 4 BBCNewshttp://news.bbc.co.uk/2/hi/uk_news/england/2546563.stm.