it's been rubbish for years!

A numeracy activity addressing key elements of the National Numeracy Strategy (NNS) and examining the recent history of waste and how we can reduce it

Relevant elements of the Year 5 NNS Teaching Programme (p 22-23)

Suggested focus for this activity:

Percentages

- Begin to understand percentage as the number of parts in every 100, and find simple percentages of small whole-number quantities

Handling data

- Solve a problem by representing and interpreting data in tables, graphs and diagrams including those generated by a computer [with] vertical axis labelled in...20s where intermediate points...have meaning

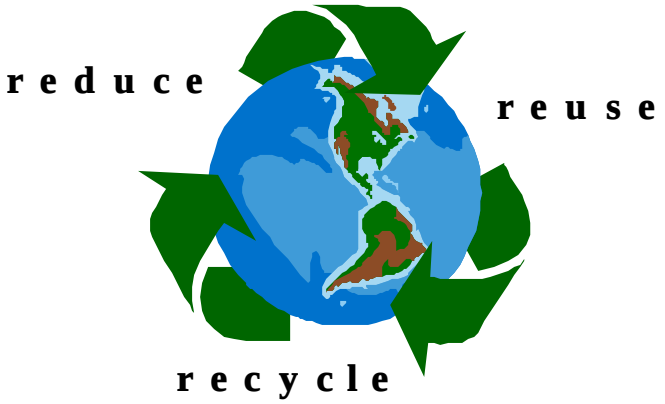
Solving problems:

- Choose and use appropriate number operations to solve problems, and appropriate ways of calculating
- ...recognise and explain patterns and relationships
- ...solve simple word problems involving numbers and quantities based on 'real life', money or measures...and finding simple percentages

Global Citizenship aims of the history of rubbish activity

- ✓ To find and select evidence and begin to present a reasoned case
- ✓ To help children understand the relationship between people and the environment
- ✓ To recognise the consequences of choices on other people and the environment both locally and globally
- ✓ To foster a sense of responsibility for the environment and for the use of resources
- ✓ To equip children with the knowledge and understanding to empower them to take positive actions which ensure greater social justice and protect the environment

These aims are based on the Oxfam Curriculum for Global Citizenship, available from Oxfam Education, 274 Banbury Road, Oxford, OX2 7DZ



Suggested lesson structure

This activity could be used as an introduction to an understanding of percentages as the number of units out of every 100.

Mental and oral starter

This part of the lesson should reinforce and practise the concept of percentage as the number of parts in every 100. Mental work should involve finding simple percentages of various small whole-number quantities. Children could be presented with money puzzles, e.g. if I had 20% of £1.00 in my pocket what coins might I have in my pocket? What about 50% of £1.00? 99% of £1.00? etc. This idea could then be extended to ask children to calculate 20% of £2.00/£4.00 etc. Children could respond by writing answers on individual whiteboards.

The main teaching activity

The activity provides an opportunity to combine understanding of percentages with accurately reading and interpreting real life data presented in the form of a graph.

Introduction: A few simple calculations should be discussed, e.g. 20% of multiples of 100 such as 20% of 300, 400, 1000 etc. Calculation strategies should be explored, e.g. find 20% of 100 and multiply by 2 for 200 or 4 for 400 etc. The worksheet opposite may be photocopied or turned into an OHT and introduced and discussed with the whole class.

Tasks: Less able children could work on the activity with support and focus or the first three questions. More able children could be challenged to work out kg quantities of different rubbish materials for the average 1990s person throwing away 400kg per year.

Plenary session

The main purpose of the plenary session will be to explore the calculation strategies used in the numeracy questions. It is also important that there is an opportunity, either during the plenary session or at another time, to examine some of the waste issues raised in the questions for discussion, particularly that there have been positive and negative changes since the 1930s and that waste can be reduced. Below is some information which may be useful for this discussion.

In the 1930s

- Plastic was virtually unknown as a packaging material.
- Most households had a coal fire which generated significant amounts of ash and dust, hence the high percentage of this type of waste and the name dustbin
- People burned much of their paper waste
- Liquids were packaged in glass containers which could be returned for a refund and then refilled

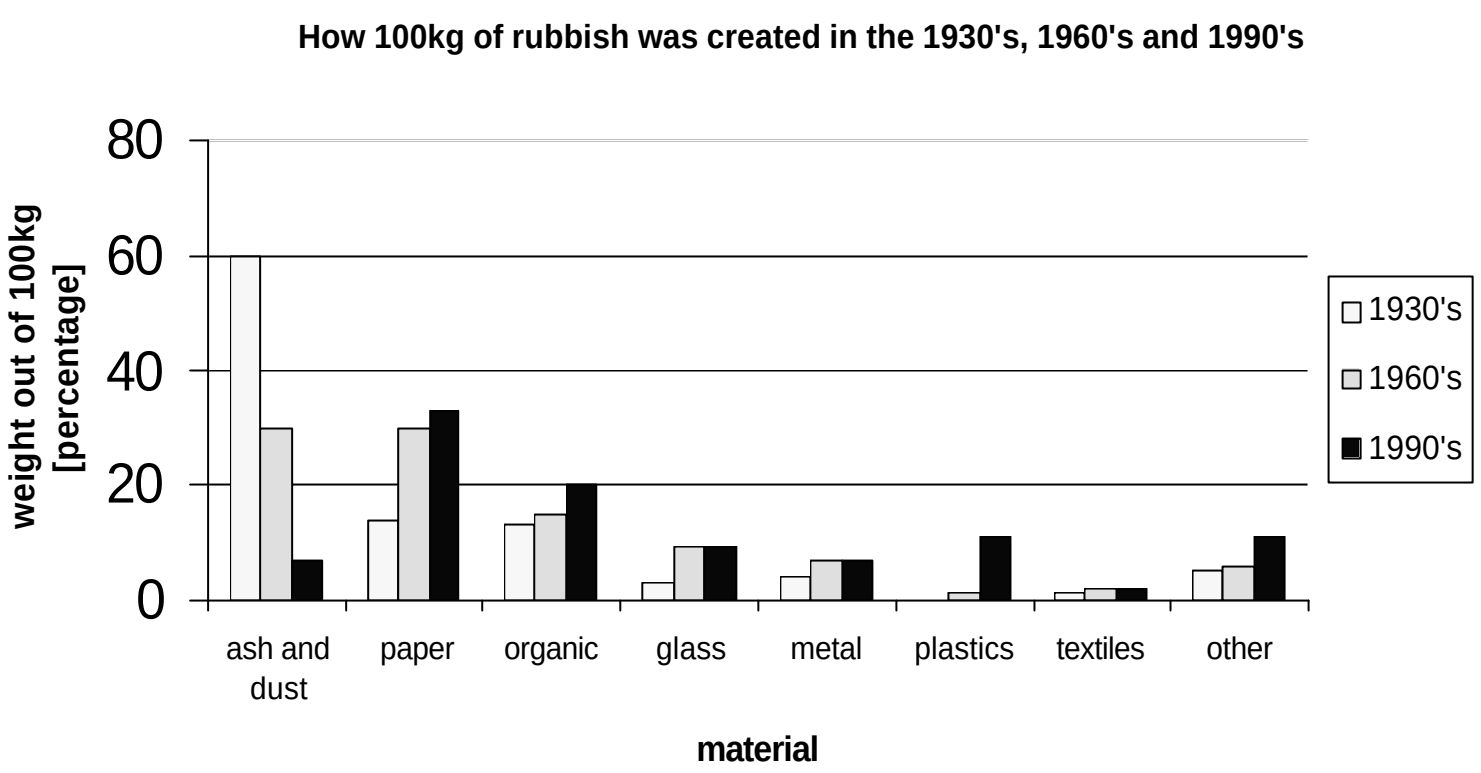
In the 1960s:

- Fewer homes had coal fires because of the Clean Air Act 1956, introduced after severe smog's in the late 1940s and early 1950s.
- More and more homes introduced central heating systems
- Glass deposit schemes began to disappear and plastics began to appear in household waste.

In the 1990s:

- Hardly any homes used a coal fire as their main source of heating.
- The range of plastic packaging had increased substantially
- As people became better off financially the amount of waste in weight and volume rose by about 2% per year.

The rubbish split



The graph above shows how much rubbish was created by each of seven different materials in the 1930s, 1960s and 1990s out of every 100kg of rubbish. Percentage (%) is a word that means 'out of every 100'.

Answer the following questions using percentages.

1. Estimate the percentage of each type of rubbish in the 1960s. Check the total adds up to 100%
2. Which two materials have not changed their percentage between the 1960s and 1990s?
3. Estimate the difference in percentage of paper waste between the 1990s and the 1930s
4. Each person in the UK created about 400kg of waste per year in the 1990s. 20% of rubbish in the 1990s was organic, (things like fruit and vegetable peelings and thrown away food). This means 20kg out of every 100kg was organic rubbish. Estimate what weight of organic rubbish each person created in the 1990s.

Questions for discussion

1. Which material formed the most rubbish in the 1930s? Why do you think this was? Why had this type of rubbish reduced so much by the 1990s?
2. Which material formed the most waste in the 1990s? What could we do to reduce this type of rubbish?
3. Why was there no plastic rubbish in the 1930s? Why has plastic waste increased so much by the 1990s? How could we reduce the amount of plastic waste we create?
4. What types of rubbish might be in the 'other' category?

Further resources

The following titles offer opportunities for further activities on issues of waste and recycling for KS2.

Protecting our environment: a practical guide to waste minimisation. A resource pack for Key Stage 1 & 2 produced by the Tower Hamlets Waste Education Project. Features a host of facts and figures on waste as well as pupil activities and curriculum links. Available from HEC (contact details on back page) Price: £14.95 inclusive of postage and packaging.

The Dustbin Pack. A resource for Key Stage 2 produced by *Waste Watch*. Contains teachers notes, children's fact sheets and activities on waste and its impacts and the potential for reduction through reuse and recycling. Available free to schools (contact details on back page)

Useful websites on waste and recycling

Waste Watch: www.wastewatch.org.uk Click on schools and kids, then 'Fun for kids' option for games, activities, quizzes, facts and figures on waste.

Recycle-more: www.recycle-more.co.uk/b2s/intro.html A schools section of the site for both teachers and pupils who want to learn more about how to tackle waste. Includes activities, games and information on waste and recycling.

Environment Agency: www.environment-agency.gov.uk/kids contains information, environmental games, and animations for children on waste and other environmental issues.

Feedback on these activity ideas would be much appreciated. Comments can be sent to HEC or your local DEC or made via the Global Footprints website.

Further ideas, contacts and information

What a Waste! Challenge

The amount of waste we create is increasing all the time. An average person in the UK now throws away 450kg of rubbish each year.

Try the challenge below to see if you can estimate accurately the equivalent number of individual items the weight of material represents.

1. Estimate…

Calculate…

- We each use about 6 trees worth of paper a year (unless of course we use scrap and buy recycled paper!). How many trees a year does this mean are used by your class?

Material	Weight (KG)	Equivalent to
Paper and cardboard	149	____ magazines
Organic – things that rot	90	____ banana skins
Plastics	50	____ drinks bottles
Glass	41	____ jam jars
Metals	30	____ baked bean cans
Textiles	9	_____ T-shirts
Other	81	____ batteries
Total	**450**	

- The amount of textiles thrown away each month weighs the same as 40,000 cars. How many cars worth of textiles are thrown away each year?
- It has been worked out that for every £50 spent on buying things, £8 goes to pay for the packaging! How much would a family that has spent £3000 on things have paid for the packaging?
- If milk is bought in glass bottles the bottles can be returned to be refilled time and time again. If a family who buy two cartons of milk a day switch to buying refillable bottles instead how many cartons would they prevent being thrown away over a period of four weeks?

Answers

Estimate...

149 kg of paper and cardboard equivalent to 570 magazines
90 kg organic equivalent to 2000 banana skins
50 kg of plastic equivalent to 900 drinks bottles
41 kg of glass equivalent to 164 jam jars
30 kg of metal equivalent to 630 baked beans cans
9kg of textiles equivalent to 45 T-shirts
81 kg of other waste equivalent to 1800 batteries (9 volts)

Calculate...

1. 6 x number of children in the class. A significant bit of forest!
2. 40,000 x 12 = 480,000 cars worth of textiles thrown away every year!
3. (£3000 ÷ £50) x 8 = £480 spent on packaging!

Further information about waste

The following organisations will be able to provide further information on waste and recycling

Oxfam 274 Banbury Road, Oxford OX2 7DZ Tel:01865 313600
Produce a range of global citizenship education packs. Education catalogue contains extensive range of resources across the curriculum. To order phone 01202 712933. Also have a website dedicated to teachers and children which contains information and activities: **www.oxfam.org.uk/coolplanet**

Friends of the Earth 26-28 Underwood Street, London N1 7JQ Tel: 020 7490 1555 **www.foe.co.uk**
Produce information sheets and other resources suitable for young people on all environmental issues including waste and recycling.

Waste Watch Europa House, Ground Floor, 13 - 17 Ironmonger Row, London EC1V 3QG Tel: 0870 243 0136
www.wastewatch.org.uk
A national charity with cross-sector support which aims to educate, inform and raise awareness on waste reduction, reuse and recycling.

Eco schools Tidy Britain Group, The Pier, Wigan, WN3 4EX
www.eco-schools.org.uk
A Europe wide project designed to encourage whole-school action for the environment. Operate an award scheme for schools who adopt an action plan to make environmental improvements in the school community

Development Education Centres (DECs)
This resource has been produced by the Humanities Education Centre, a DEC in Tower Hamlets, with contributions from other DECs. Your local DEC will be able to provide a range of exciting resource ideas for the teaching of Global Citizenship. To find your nearest DEC contact:
Development Education Association,
29-31 Cowper Street, London, EC2A 4AP
☎ 020 7490 8108 e-mail devedeassoc@gn.apc.org

Your local DEC: