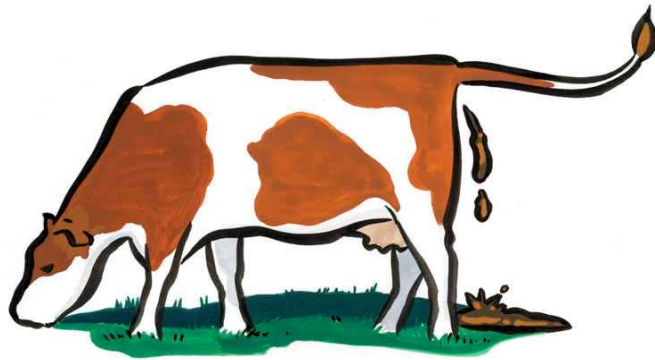




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## **Soil Association Education Resources**

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### **What a waste! Reducing, reusing and recycling waste on farms.**

Written by Vicki Cracknell  
Illustrations by Simon Roberts  
Design by Charlie Dewey



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## Soil Association Education Resources

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### What a waste! Reducing, reusing and recycling waste on farms.

These activities have been designed for children who have visited a farm and have some knowledge of the kinds of waste found on farms. They could however be used by classes that have not visited a farm for an official visit, for example in rural areas where children may have direct experience of farm waste issues. Alternatively the activities could be used as part of a topic on waste and linked to work on waste at school and home.

#### Activities

Activity 1: Waste not, want not. What can we do with all the waste?

Activity 2: Not just a load of old muck! Looking at recycling manure

Activity 3: Make friends with a worm. Build your own wormery

Activity 4: Plastic fantastic. Designing new things with plastic waste from farms

This resource has been produced as part of the Soil Association's waste minimisation project. This project aims to help organic farms and business minimise and manage waste throughout the organic supply chain. The project is sponsored by the RMC Environment Fund and Marks and Spencer.



RMC Environment Fund

MARKS &  
SPENCER

Resources written by Vicki Cracknell  
Illustrations by Simon Roberts

## Activity one: Waste not, want not. What can we do with all the waste?

### Curriculum Links:

Science 2: 1 c) 5 f)

Geography: 5 a) 5 b) 6 e)

PSHE: 2) a) 2) j)

### Objectives:

- To consider the reduction and processing of waste on farms
- To understand that waste can be re-used and recycled in beneficial ways.

### Resources:

Teaching resource WR1 *All kinds of waste*. Additional copies of this colour resource can be downloaded at [www.soilassociation.org/education](http://www.soilassociation.org/education) and go to Key Stage Two resources. You may have some photos from your farm visit that you could use.

### What to do:

In groups pupils study the pictures on WR1 *All kinds of waste*. This shows different kinds of waste found on farms: manure, silage in black plastic, cardboard, and scrap metal. You will probably need to explain that silage is grass or other green plants that are cut and stored, without being dried first to feed cattle in winter, i.e. pickled grass! Do the children remember seeing these types of waste on the farm? Where about did they see them? Can they think of any other types of waste found on farms?

Discuss ideas on how to manage the waste found on farms. Explore the three Rs: Reduce, re-use and recycle. More on this can be found at [www.wasteonline.org.uk](http://www.wasteonline.org.uk) Go to “Browse topics” and then “The problem with waste” or “Waste at home”. Put the children into groups and ask each group to think of ways of processing the different types of waste on farms. Ask them to make comparisons with what they do with waste at home or at school. In their groups they could come up with ways to dispose of or use each kind of waste and write them on an A3 sheet with the word WASTE in the middle.

**Manure:** spread straight away, or compost to break down harmful bacteria and then use to build soil fertility

**Cardboard:** landfill, burn, recycle or compost

**Plastic:** re-use, landfill, burn, recycle or use bio-degradable plastics

**Metal:** re-use e.g. sell to scrap merchants, landfill or recycle

**Vegetable waste:** landfill, feed to farm animals or compost. Alternatively out-grades (produce which is rejected by supermarkets) could be chopped and canned

**Chemicals such as pesticides:** landfill, removal by specialist contractor or minimize use from the outset (synthetic pesticides are not permitted in organic farming so disposing of this kind of waste is not an issue on organic farms).

Finally sort the types of waste into waste that will ROT and waste that will NOT. Introduce the term “bio-degradable” and compare with materials such as plastic.

### Teachers' notes:

An excellent website with links to other waste organisations is [www.recyclezone.org.uk](http://www.recyclezone.org.uk)

Go to the Teacher Zone and choose “waste on the web”.

## Activity two: Not just a load of old muck! Looking at recycling manure

### Curriculum Links:

Science 2: 1 c) 5 f)

Geography: 5 a) 5 b) 6 e)

PSHE: 2) a) 2) j)

### Objectives:

- To understand how manure can be composted and safely recycled
- To appreciate that there are ways of improving soil fertility without using chemicals that harm the environment.

### Resources:

Teaching resource WR2 *Not just a load of old muck!* Additional copies can be downloaded at [www.soilassociation.org/education](http://www.soilassociation.org/education) and go to Key Stage Two resources.

### What to do:

Remind the children of activity one, and explain that today you are going to be talking about muck... What were their ideas from the last session about what can be done with all the manure produced by the animals on the farm? Explain that there are ways of using it which are safe and maximise its benefits to soil fertility. What do they think is meant by soil fertility?

Give each group a set of the pictures and text and ask them to arrange them in order to show the “manure cycle”. They can arrange them in a circle which starts and ends with the picture of cows eating grass. The correct order would be:

1. Cows eating grass
2. A cow doing a cowpat
3. Manure heating
4. Manure being spread
5. Grass growing

You can discuss with children the role of:

#### *Micro-organisms*

1. Millions of micro-organisms live in a handful of soil. Some are too small to see with the naked eye.
2. Micro-organisms live in soil and decompose organic matter in various ways. They need warmth and moisture to do this. This is why organic farmers let the manure heap heat up and then turn it regularly.
4. Micro-organisms release nutrients from organic matter as they break it down and some micro-organisms bring soil, and nutrients, to the surface for plants to use.

#### *Worms*

1. Vermicomposting (vermi is latin for worm) is the process of using worms to process organic food waste into soil that is rich in nutrients.
2. Worm poo makes very good compost. It is rich in beneficial microbes and nutrients and is a great fertiliser.
3. The best types of worms for processing food waste are red worms (not earth worms) because their main goal in life is to break down organic matter. Red worms can eat their own weight in food waste every day!

4. Red worms are not fussy eaters! They will eat vegetable and fruit peelings, coffee grounds, newspaper and anything that is organic (i.e. anything that is natural and will rot down)
5. Once manure has broken down and been spread on the fields, then earthworms mix the manure with the soil.

### **Teachers' notes:**

In reality animals are often rotated on grazing areas, for example sheep follow cows. This helps avoid the build up of parasites that affect certain species. Also, manure spreading on grass is often used to produce hay and silage (grass that has been preserved in large black plastic bags) to feed the animals during the winter months.

### **Activity three: Make friends with a worm. Build your own wormery**

#### **Curriculum Links:**

Science 2: 1 c) 5 f)

#### **Objectives:**

- To appreciate that soil is full of living organisms
- To understand that worms facilitate decay and alter the structure of the soil.

#### **Resources:**

1. A collection of worms from different habitats. The children could collect them by looking in soil, leaf litter and under stones. Or you can buy some (see below)
2. Different types of soil, e.g. clay, sandy, loam, sand and compost
3. Leaves and plant matter
4. A fish tank with dark covering for the sides and a lid.

#### **What to do:**

Put layers of different soil, sand and compost in an aquarium and finish off with a layer of old leaves. Add some worms and then make sure the sides and top are covered by dark paper. Keep the tank moist but not water logged. From time to time the class can lift off one side of the paper to see how the worms are getting on, where they are working and how quickly they mix up the layers.

#### **Teachers' notes:**

For a useful guide to setting up your own worm composting bin in school, go to [www.ciwmb.ca.gov/Publications/Schools/56001007.pdf](http://www.ciwmb.ca.gov/Publications/Schools/56001007.pdf)

You can order worms from the following suppliers:

[www.wormsdirectuk.co.uk](http://www.wormsdirectuk.co.uk), [www.wigglywigglers.co.uk](http://www.wigglywigglers.co.uk) and [www.recycleworks.co.uk](http://www.recycleworks.co.uk)

## **Activity four: Plastic fantastic. Designing new things with plastic waste from farms**

### **Curriculum Links:**

Design and technology 1 a) 1 d) 4 a)

Geography: 5 a) 5 b) 6 e)

PSHE: 2) a) 2) j)

### **Objectives:**

- To appreciate that plastic is a non-biodegradable material
- To use their creativity to design products that could be made from recycled plastic.

### **Resources:**

1. Picture of plastic waste from a farm (on teaching resource WR1)
2. Pictures of a range of products that have been made from recycled plastic. See websites below
3. Examples of everyday objects made from plastic. This should include a fleece.

### **What to do:**

Pupils could begin the activity by discussing what they think happens to all the plastic waste from farms (and houses, schools, supermarkets, restaurants etc). Do they know what happens to most kinds of plastic when they are buried in a landfill site? Explain that most kinds of plastic don't break down, and fill up lots of space at landfill sites. Compare the difference with organic matter and how it breaks down and forms compost.

Pupils can then investigate what products can be made from recycled plastic by looking at the following websites:

[www.recoup.org/business/default.asp](http://www.recoup.org/business/default.asp)

[www.recycle-more.co.uk/](http://www.recycle-more.co.uk/)

[www.wasteonline.org.uk/resources/InformationSheets/Plastics.htm](http://www.wasteonline.org.uk/resources/InformationSheets/Plastics.htm)

[www.itdg.org/html/technical\\_enquiries/docs/recycling\\_plastics.pdf](http://www.itdg.org/html/technical_enquiries/docs/recycling_plastics.pdf)

Following on from this, the pupils could design a product made from recycled plastic. The ideas could be made into a class book called "Plastic Fantastic".

### **Teachers' notes:**

It may be interesting to discuss with children that oil in the form of petrochemicals is one of the key ingredients used to make plastic. This means that if we use lots of plastic and don't re-use or recycle it we are using up a precious and finite natural resource. For child friendly information on everyday uses of oil go to the oil industry website [www.priweb.org/ed](http://www.priweb.org/ed)

## **Full Curriculum Links:**

### **Science - Life processes**

1. c) Make links between life processes in familiar animals and plants and the environments in which they are found.
5. f) Understand that micro-organisms are living organisms that are often too small to be seen, and that they may be beneficial [ for example, in the breakdown of waste, in making bread ] or harmful [for example, in causing disease, in causing food to go mouldy].

### **Geography**

5. a) Recognise how people can improve the environment [ for example, by reclaiming derelict land ] or damage it [for example, by polluting a river], and how decisions about places and environments affect the future quality of people's lives
5. b) Recognise how and why people may seek to manage environments sustainably, and to identify opportunities for their own involvement [ for example, taking part in a local conservation project.
6. e) An environmental issue, caused by change in an environment [ for example, increasing traffic congestion, hedgerow loss, drought ], and attempts to manage the environment sustainably [for example, by improving public transport, creating a new nature reserve, reducing water use].

### **PSHE**

2. a) To research, discuss and debate topical issues, problems and events
2. j) That resources can be allocated in different ways and that these economic choices affect individuals, communities and the sustainability of the environment

### **Design and technology**

1. a) Pupils should be taught to generate ideas for products after thinking about who will use them and what they will be used for, using information from a number of sources, including ICT based sources
1. d) Communicate design ideas in different ways as these develop, bearing in mind aesthetic qualities, and the uses and purposes for which the product is intended.
4. a) Pupils should be taught how the working characteristics of materials affect the ways they are used