

Teacher's Guide

- **Recycling Lesson**
- **Recycling Lesson Bolt-On**



Introduction

This Teacher's Guide contains background information to help you deliver the Recycling Lesson (with optional bolt-on) to your class. This lesson is intended for primary school pupils in Scotland aged 7 – 11. The Recycling Lesson has been designed to take approximately 35 minutes and the optional bolt-on to take up to an additional 25 minutes to deliver.

The aim of this lesson is to educate pupils on recycling. It intends to inform children of Zero Waste Scotland's key messages which include: why we should recycle, what can be recycled (highlighting less commonly recycled materials if appropriate) and the recycling journey (including statistics about recycling). To support teachers in the delivery of this lesson, this guide covers this information in order to give teachers confidence in the material and should be used alongside the other resources in this pack. The information in this guide follows the same order in which the lesson is designed to be delivered along with supplementary information. The sections include:

- 1** Recycling Lesson
- 2** Recycling Lesson Bolt-On
- 3** Lesson Links with Curriculum for Excellence
- 4** Additional Zero Waste Ideas for Your School

Recycling Lesson

Aspects in this lesson include:

- What is Recycling?
- Why Recycle
- What can I recycle?
- Recycling Journey (including video transcripts and answers to activity questions)
- Recycling Quiz (including a suggested marking scheme)

Activities in the lesson are generally self-explanatory.

Class settles, topic is introduced, and learning intentions & success criteria are covered

Learning intentions and success criteria should be covered by displaying them to pupils (using the Recycling Lesson PowerPoint slide 2) and having the teacher read them to the class. Alternatively, these could be read out by pupils if they are old enough or able enough.

Think-Pair-Share

Think-Pair-Share is a simple cooperative learning activity that helps to assess prior knowledge on a topic. This three-step technique is delivered as follows:

- 1) Pupils work individually to answer the three recycling questions writing their answers on their mini-whiteboards with whiteboard pens. – 1 minute**
To encourage participation, pupils may be invited to hold up their mini-whiteboards for the teacher at the end of the minute. This step allows pupils to form their own ideas.
- 2) Pupils work with a partner to share their answers with one another; pupils can add to their own answers on their mini-whiteboards. – 1 minute**
This step allows pupils to articulate their thoughts and consider others' ideas.
- 3) The teacher invites pupils to share their ideas with the class. – 1 minute**
Having rehearsed their answers with a partner, pupils should be more comfortable sharing their refined ideas with the class.

Education Scotland considers Cooperative Learning to be an effective approach to learning. To read more about cooperative learning please click [here](#).

What is Recycling?

To recycle an item means to use the item to make something new.

Pupils may use words such as cycle, reduce, reuse, or compost to help in their definition. They may start to: apply concepts such as preventing rubbish (or waste reduction); discuss the environmental benefits (e.g. saves energy) or identify recyclable items (glass, paper, cans, etc.)

Why Recycle

This section provides background information on why we should recycle. Older or more able pupils may wish to discuss these in more detail.

Recycling conserves resources

When we recycle, used materials are converted into new products, reducing the need to consume natural resources. If used materials are not recycled, new products are made by extracting fresh, raw materials from the Earth, through mining and forestry

Recycling helps conserve important raw materials and protects natural habitats for the future.

Recycling saves energy

Using recycled materials in the manufacturing process uses considerably less energy than that required for producing new products from raw materials – even when comparing all associated costs, like transport.

Plus there are extra energy savings because more energy is required to extract, refine, transport and process raw materials ready for industry compared with providing industry-ready materials.

Recycling helps protect the environment

Recycling reduces the need for extracting (mining, quarrying and logging), refining and processing raw materials all of which create substantial air and water pollution.

As recycling saves energy it also reduces greenhouse gas emissions, which helps to tackle climate change. Currently in Scotland, recycling is estimated to save nearly 1.9 million tonnes of CO₂ a year – the equivalent to taking half a million cars off the road.¹

Recycling reduces landfill

When we recycle, recyclable materials are reprocessed into new products, and as a result the amount of rubbish sent to landfill sites reduces. There are over 1,500 landfill sites in the UK, and in 2001, these sites produced a quarter of the UK's emissions of methane, a powerful greenhouse gas.²

What can I recycle?

To adapt this lesson to your school's council area and so pupils understand what they can and can't recycle, use the **Recycling Locator** to discover what can be recycled at home:

- 1 Click to open the [Recycling Locator](#)
- 2 Click **How to Recycle at home**
- 3 Enter your school's town or postcode
- 4 Become familiar with what you can (and cannot) recycle in your school's council area

The teacher should use the Recycling Locator in advance of the lesson. The knowledge gained from the Recycling Locator can be used to inform pupils what they can and cannot recycle along with Recycling Lesson PowerPoint slides 6 & 7. Slide 7 should be adapted to reflect additional items that can be recycled in your school's council area. In other words you should delete image(s) on slide 7 as appropriate. For example if cartons and foil trays can be recycled then the slide should be amended to show:



It is also recommended that this task is set to pupils in advance of the lesson. Pupils are to find out what items can and can't be recycled in their council area. This can be achieved by asking their parent(s)/ carer(s), researching online, etc.

If possible it will be useful to have a couple of items with the recycling symbol brought in to pass around the class. Examples of items include a biscuit box, a plastic juice bottle and a glass sauce jar.

Game: What can I recycle?

For this game split the class into two groups. For each room each group will write down as many items as they can as well as the material it is made of, e.g. shampoo bottle, plastic. Use a timer to give the groups one minute per room. Award one point for each room to the group with the most correct answers. In the event of a tie award each group one point. The group with the most points at the end wins.

This activity focuses on items that can be recycled but the teacher may wish to discuss items that cannot be recycled with older or more able pupils. The teacher should also discuss items that may be recycled in your school's council area: food & drink cartons, aerosols, foil, and plastic pots, tubs and trays, as well as food waste.

Recycling in the Bathroom

There are lots of items in the bathroom that can be recycled, and this can make a huge difference. For example, if everyone in the UK recycled one toothpaste box, it would save enough energy to run a fridge in over 2,000 homes for a year. Here's a handy list to remind you:

- ✓ Toothpaste boxes
- ✓ Toilet roll tubes
- ✓ Plastic shampoo and conditioner bottles
- ✓ Shower gel containers
- ✓ Liquid soap bottles
- ✓ Bathroom cleaner bottles

Just remember to remove the trigger spray and pump dispenser tops!

Furniture and toys may be able to be re-used - check local recycling centre.

Recycling in the Living Room

Did you know that it takes seven days for a recycled newspaper to come back as newspaper again? You could be reading your favourite newspaper comic on recycled paper in no time at all! In this room you can often find these items for recycling:

- ✓ Envelopes
- ✓ Newspapers
- ✓ Cardboard packaging from online shopping
- ✓ Cans
- ✓ Plastic bottles
- ✓ Glass bottles

- ✓ Greeting cards
- ✓ Paper
- ✓ Plastic cup - depending on the school's council area

Furniture, books and toys may be able to be re-used - check local recycling centre.

Even air fresheners can make a difference - if one aluminium air freshener aerosol is recycled by everyone in the UK; enough energy could be saved to vacuum over 876,000 homes for a year – that's a lot of tidy homes!

Recycling in the Bedroom

If everyone in the UK recycled one aluminium deodorant aerosol, enough energy would be saved to run a TV in over 151,000 homes for a year. Amazing isn't it? Items to look out for include:

- ✓ Empty tissue boxes
- ✓ Old magazines
- ✓ Empty deodorant aerosols and hairspray - depending on the school's council area
- ✓ Old clothing - depending on the school's council area

Furniture, books and toys may be able to be re-used - check local recycling centre.

Recycling in the Kitchen

Along with the usual drinks bottles in the kitchen, remember to check the cupboard under the sink! Items often forgotten include:

- ✓ Washing-up liquid bottles
- ✓ Surface cleaner bottles - just remember to remove the trigger top!
- ✓ Washing liquid and conditioner bottles
- ✓ Aerosols, tins of furniture polish and air fresheners - depending on the school's council area
- ✓ Empty dishwasher tablet boxes and kitchen wrap boxes/tubes
- ✓ Cereal boxes
- ✓ Plastic sauce bottles e.g. ketchup
- ✓ Cardboard egg cartons
- ✓ Plastic yoghurt pots - depending on the school's council area
- ✓ Plastic drink bottles
- ✓ Food tins e.g. baked beans
- ✓ Glass bottles and jars
- ✓ Drink cans

Furniture, books and toys may be able to be re-used - check local recycling centre.

Pupils are to watch the 'Recycling around the home' video (1m:10s) to consolidate their learning on this section. The website where this video is located can be accessed by clicking on the video image on slide 13 which is accessible when PowerPoint is viewed in 'Slide Show' mode; alternatively the web address can be copied and pasted into an internet browser.

Recycling Journey

This section covers the recycling journey for cans and plastic bottles. Pupils will watch a video on each and then answer questions as a class. Videos can be accessed by clicking on the video image on each slide and these are accessible when PowerPoint is viewed in 'Slide Show' mode; alternatively the web addresses are located in the notes section of each slide. The answers to the questions are bolded in each video transcript below.

Cans – how they are recycled (0:53s)

Last year in the UK we recycled around 3.5 billion aluminium cans - that is enough to stretch around the world over 10 times so...

Here's how we do it. Cans are sorted from other waste either by hand or by machine; the cans are then divided into metal types using magnets, steel cans are separated leaving aluminium cans to be shredded into small pieces. These small pieces of aluminium are then formed into blocks. The blocks are then put into a furnace and heated to over 750°C. Chemicals are added to improve the quality of the molten metal which is then poured into moulds and cooled by a curtain of water and then rolled into very thin sheets, ready to be made into more cans and can be back on the shelves **in just 6 weeks**.

Plastic Bottles – how they are recycled (0:47s)

In the UK we use millions of plastic bottles, tubs and trays a day.

Most of these could be recycled into really useful things; here's how.

Bottles, tubs and trays are separated from other recyclable materials by hand or machine.

They are cleaned and sorted by plastic type using clever technology, then sorted by colour - blue, natural, green and mixed - and are shredded, washed, melted and reformed into pellets which can then be used to make **fleeces and footy shirts as well as toys, chairs and picnic benches or... more plastic bottles**.

Recycling Action

This task is to encourage pupils to help recycle more at home. Each pupil will complete an action card by writing at least one action. Examples of suitable actions are:

- Encourage my parents to recycle
- Find the recycling symbol on packaging
- Use more things that are recyclable
- Recycle my drink cans (or any other appropriate item)

Pupils should be encouraged to take these cards home to their parent(s)/carer(s). To follow up, pupils should be encouraged to discuss in class the following week how they are getting on with their actions.

Recycling Quiz

This short quiz will help to reinforce the key recycling messages. The quiz may be carried out as formative assessment by pupils writing their answers on their mini-whiteboards or as summative assessment by pupils writing their answers on paper so that a record may be kept. The quiz is out of a total of 10 marks.

1) Give a reason why we should recycle. (How is it good for the environment?) – 1 mark

[Pupils to list one of the following for 1 mark.]

- i) Recycling saves resources
- ii) Recycling saves energy
- iii) Recycling helps protect the environment
- iv) Recycling reduces landfill

2) Name 5 items that you can recycle in your home. – 5 marks

[Pupils to list any 5 of the following for 1 mark each. Please verify that pupils can in fact recycle the items that they list in your school's council (see 'What can I recycle').]

Items that can be recycled anywhere in Scotland:

- Glass bottles and jars
- Food tins and drinks cans
- Plastic bottles
- Paper and card

Items that can be recycled in some councils in Scotland:

- Food and drinks cartons
- Aerosols
- Foil
- Plastic pots, tubs and trays
- Food waste

3) Choose 2 items that you can recycle and briefly describe what happens to these items when they are recycled. – 4 marks

[Pupils to briefly describe any two of the following for 2 marks each. Pupils may list two steps in the recycling process or summarise the entire process in two statements.]

Cans

Cans are sorted from other waste either by hand or by machine/ The cans are divided into metal types using magnets/ Steel cans are separated leaving aluminium cans to be shredded into small pieces/ Small pieces of aluminium are formed into blocks/ The metal blocks are put into a furnace and heated to over 750°C/ Chemicals are added to improve the quality of the molten metal/ The metal is poured into moulds and cooled by a curtain of water / The metal is rolled into very thin sheets ready to be made into more cans/ The cans can be back on the shelves in just 6 weeks.

Plastic bottles

Bottles, tubs and trays are separated from other recyclable materials by hand or machine/ Plastic items are cleaned and sorted by plastic type (using clever technology)/ Plastic items are sorted by colour - blue, natural, green and mixed/ Plastic items are shredded, washed, melted and reformed into pellets/ Plastic pellets can be used to make fleeces, footy shirts, toys, chairs, picnic benches or more plastic bottles.

Recycling Lesson Bolt-On

This optional bolt-on is designed to be delivered in 25 minutes and contains additional activities to support pupil learning of the Recycling Lesson. If the Recycling Lesson Bolt-On is to be used, insert the additional activities after the 'Recycling Action' and before the 'Recycling Quiz'.

Recycling Facts Activity

This activity is designed to allow pupils to be creative and artistic. Pupils will be numbered off 1 – 4 by the teacher. Four recycling facts will appear on the screen: a pupil that has been designated '1' will be assigned Recycling Fact 1. Pupils may use their mini-whiteboards to draw a picture that describes their fact and they will have 5 minutes to complete this task. If the teacher wishes to extend this activity further or to have a record of pupil work then paper and pens can be used instead. After 5 minutes, pupils will pair up, will show their picture and tell their fact to their partner.

Depending on the age and ability of the pupils, the teacher may wish to differentiate this task by assigning more complex facts to more able pupils. A selection of facts from the list below may be used:

- It can take 7 days for an old newspaper to be recycled and put back in the shops as a new newspaper.
- All of the newsprint in the UK contains around 78% recycled paper.
- If you recycle 1 tonne of cardboard you can save 17 trees.
- Drinks cans are a great thing to recycle because it takes 20 times less energy to make a can from recycled aluminium than it does from new aluminium.
- Around three quarters of all aluminium ever made is still used today because it is such a useful resource.
- The energy saved from recycling one plastic bottle can power a lightbulb for 3 hours.
- It only takes 25 big plastic bottles to make a fleece jacket.
- In Scotland we use 57,000 tonnes of cartons every year – that is the same weight as 331 blue whales.
- Drinks cans are 100% recyclable and can be made into anything from football stadiums to bicycle frames.

This task may be extended to create artwork that shows pupil development in using visual elements and concepts (line, shape, texture, etc.)

This task may also be extended to develop pupil numeracy. Each recycling fact above contains a number which could be used to make further calculations. For example, "If you recycle 1 tonne of cardboard you can save 17 trees" could be used to help pupils calculate how many trees could be saved if you recycle 5 tonnes of cardboard.

Don't Let Your Good Recycling Go To Waste

This section is designed to educate pupils on recycling contamination. Recycling bins are contaminated if they contain items which they are not supposed to. For example when a recycling bin for paper has plastic inside, or when a plastic bottle recycling bin contains a plastic bottle with juice inside. In order to avoid contamination make sure recycling is:

- Emptied - Food residues contaminate other materials.
- Rinsed - Rinsing keeps your recycling container clean.
- Sorted - Paper, metal, plastic and glass should all be recycled in the correct container.

If these steps are not followed, items may go to landfill.

Reduce, Re-Use, Recycle

This section is intended to guide a deeper understanding of waste management generally including the concepts of reduce and re-use in addition to recycle. It provides practical ways to motivate behavioural change in pupils.

Reducing waste is the best way to help the environment followed by re-using and recycling. Reducing waste is avoiding waste creation in the first place. It involves thinking before anything is purchased and asking, "Do I really need it?". One way that pupils could reduce waste is by giving family or friends a gift experience instead of a product (e.g. cinema, bowling, dinner at a restaurant, passes to a museum or tickets to a sports game). Another example of reduction is making things instead of buying, or packing lunches in re-usable containers to avoid packaging waste. Invite pupils to come up with their own examples.

Re-using is being able to find ways to use things again. For example, pupils could pass on their unwanted items, like clothing, toys or furniture, to someone else, swap with friends or take to a charity shop. Invite pupils to come up with their own examples of re-use, e.g. customising clothing, repairing a punctured bicycle tyre etc.

Questions

These questions will help to reinforce the 'reduce', 're-use' and 'recycle' concepts. These questions may be carried out as a formative assessment by pupils writing their answers on their mini-whiteboards or as a summative assessment by pupils writing their answers on paper so that a record may be kept. They may instead be discussed orally and the teacher may wish to add their own questions in this section.

1) **What is one thing you should do with your recycling to make sure it doesn't go to landfill?**

Emptied

Rinsed

Correctly sorted

2) Put these in order starting with the best for the environment:

Wrong order:	re-use	recycle	reduce
Correct order:	REDUCE	RE-USE	RECYCLE

3) What is one way that you can re-use an item?

Swap with friends

Take item to a charity shop

Pupil Reflection on the Recycling Lesson

The pupil reflection should be completed by each pupil in order that they can evaluate their learning and skills. This can be found in a separate document entitled: Pupil Reflection on Recycling. Copies of the reflection can be printed for each pupil if the teacher would like to have a record kept and these could be included in pupil learning logs or similar. Otherwise, these may be completed using mini-whiteboards.

On completion of the reflection, the teacher may wish to discuss pupil answers with the class.

Lesson Links to Curriculum for Excellence

The Recycling Lesson is interdisciplinary and covers themes for global citizenship such as education for citizenship and sustainable development education.

When this lesson is delivered in a primary school, all learners will have the opportunity to develop in the four capacities of Curriculum for Excellence (CfE). Pupils will be able to: use literacy and numeracy skills to develop as successful learners; achieve in different areas of activity to become confident individuals; evaluate environmental issues as responsible citizens; and communicate in different ways as well as work in partnership showing that they are effective contributors. In accordance with CfE's framework for assessment, appropriate learning intentions and success criteria have been included.

The pack incorporates the topic of recycling into curriculum areas including:

- Expressive Arts;
- Health and Wellbeing;
- Languages (Literacy and English);
- Mathematics;
- Sciences;
- Social Studies; and
- Technologies.

The teaching resources in the recycling pack are intended for pupils aged 7 to 11 and have been linked to applicable CfE experiences and outcomes at the second level. These resources could be tailored for younger pupils and the outcomes adapted for the first level. Some or all of the outcomes may be covered depending on how each resource is used/extended (e.g. to what depth) and the ability level of the pupils. This pack has been linked to the following curriculum areas and associated outcomes:

Curriculum Area	Outcome
Expressive Arts – Art and design	I can create and present work that shows developing skill in using the visual elements and concepts. EXA 2-03a
Health and wellbeing – Mental, emotional, social and physical wellbeing	(Social wellbeing) I value the opportunities I am given to make friends and be part of a group in a range of situations. HWPB 2-14a
Languages – Literacy and English	(Finding and using information) As I listen or watch, I can identify and discuss the purpose, main ideas and supporting detail contained within the text, and use this information for different purposes. LIT 2-04a

Curriculum Area	Outcome
Mathematics – Number and number processes	Having determined which calculations are needed, I can solve problems involving whole numbers using a range of methods, sharing my approaches and solutions with others. MNU 2-03a
Sciences – Topical Science	I can report and comment on current scientific news items to develop my knowledge and understanding of topical science. SCN 2-20b
Social studies – People, place and environment	I can discuss the environmental impact of human activity and suggest ways in which we can live in a more environmentally-responsible way. SOC 2-08a
Technologies – Technological developments in society	Having analysed how lifestyle can impact on the environment and Earth's resources, I can make suggestions about how to live in a more sustainable way. TCH 2-02a

Additional Zero Waste Ideas for Your School

In addition to this Recycling Lesson and Recycling Lesson Bolt-On, there are additional ways that you can incorporate zero waste ideas into your school. These include:

- Delivery of the 'Recycle for Scotland' Food Waste Recycling Lesson;
- Arranging a visit to your local recycling centre;
- Request a visit from your local waste officer/ recycling assistant;
- Organise a litter pick;
- Organise a waste audit;
- Recycling at school; and
- Get involved with Recycle Week which takes place every year in June.

For further information please contact Jenny Fraser at Zero Waste Scotland's Local Authority Communications Team by emailing jenny.fraser@zerowastescotland.org.uk.