

Sustainability: Waste Management

Curriculum: Sustainability KA5a - Definitions

Key
terms

To decrease the amount of waste produced

Reduce

To refill or find another use for a product without processing it other than cleaning.

Reuse

To reprocess materials into new and useful products

Recycle



BBC
Bitesize

Task: As global populations increases, so does our waste

An increase in the global human population and consequential societal demands will result in an increase in waste production. Use the [BBC bitesize website](#) to explore the different types of waste that are produced as global populations increase, the difference in waste production between more economically developed countries and less economically developed countries, and the different strategies across different sectors that are being put in place to manage the waste. When you have finished, take the test!



BANTAM
MATERIALS INTERNATIONAL



Task: Prevent Ocean Plastics

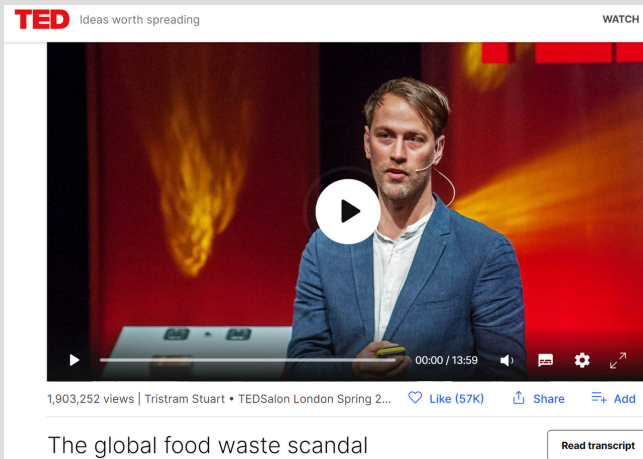
Watch the video by clicking on the YouTube logo. This shares the vision of "Prevented Ocean Plastics" and the challenges facing the world in recycling plastic waste. After the video, read the "[Dear Prime Minister](#)" letter from Raffi Schieir (Founder & Director of Bantam Materials UK, the supplier of Prevented Ocean Plastic). What messages can you take from this to change the use of plastics in your own life?

Finally, read the "[Story of a Bottle](#)" to discover the recycling journey of a discarded plastic bottle.



Task: The Global Food Waste

Nearly a billion people across the world do not have access to a secure food supply and yet Western countries throw away nearly 50% all food produced. Food waste is a global issue and each of us can adopt a more responsible attitude to global resource use. Watch the TED talk below by Tristram Stuart. Alternatively, listen to him talk on the BBC Radio 4 podcast.



In the TED talk, Tristram states: "[...] people talk about the need to increase global food production to feed those nine billion people that are expected on the planet by 2050 [...] The fact is, we have an enormous buffer in rich countries between ourselves and hunger. We've never had such gargantuan surpluses before."

As you reach the end of this Unit, having learned about food, water and energy sustainability and the global challenges humanity faces now and in the future, how does this make you feel?



LESSON PLANS

Food: Food Waste

Around a billion people don't have enough food to eat, yet we throw away around a third of all the food produced.

These resources comprise a set of informative teacher notes (including suggested learning activities) that run alongside a Powerpoint



Combine the TED talk / podcast with this lesson from YPTE on Food Waste. A [teacher guide](#) and [powerpoint](#) can be downloaded using the hyperlinks.



SSERC has developed practical activities on composting and the nitrogen cycle. Click [here](#) to access and download these resources.



Task: Scotland's Sustainable Waste Management

Waste management is a vital service. Audit Scotland were commissioned to produce a report on Scotland's Sustainable Waste Management. Below are a series of screenshots & direct quotes from this report. This task continues onto the next page.



Scotland sends more waste to landfill than most EU states but progress has been made to reduce reliance on landfill.

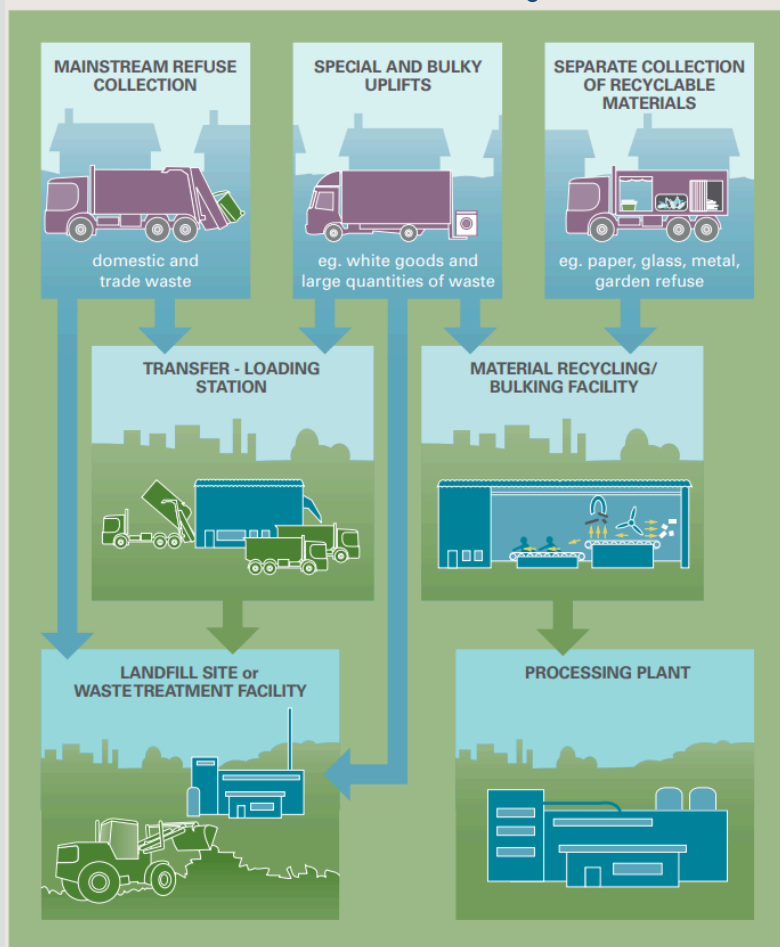
Sustainable waste management means less reliance on landfill and greater amounts of recycling and composting.

Waste management services include:

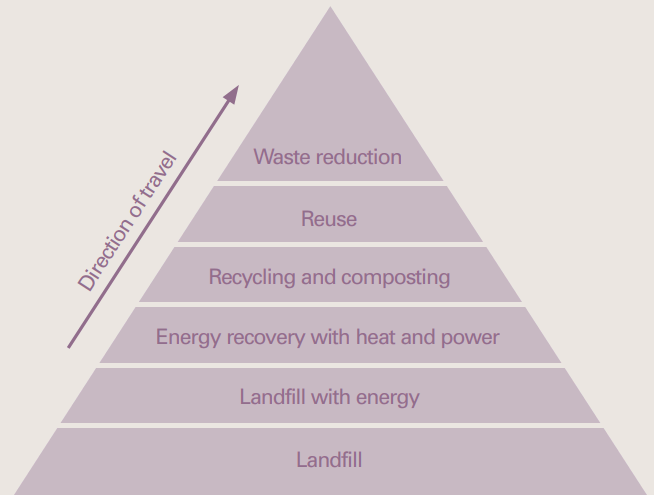
- collection of domestic/commercial refuse
- separate collection of recyclable materials, e.g. paper, cardboard, glass
- collecting garden waste for composting
- promoting recycling and educating people
- facilities to promote recycling, e.g. recycling centres
- special uplift services for bulky domestic refuse
- waste treatment facilities, e.g. composting facilities

The waste management service

Image: [Audit Scotland](#)



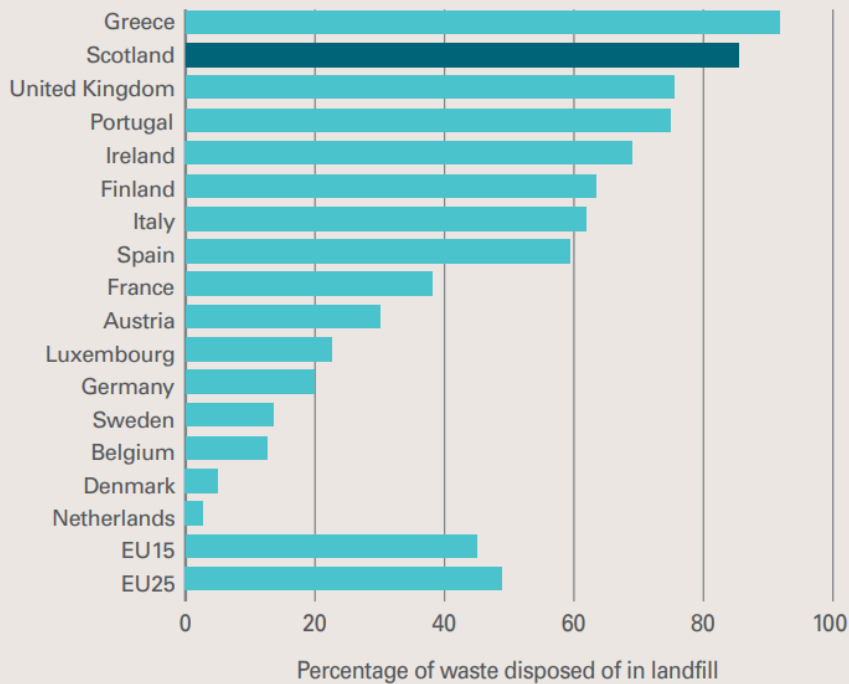
The waste hierarchy, based on the '3Rs' – Reduce, Reuse, Recover (followed by unavoidable disposal), is the cornerstone of sustainable waste management



The waste hierarchy (see image above) summarises the objectives of sustainable waste management:

- minimise the amount of waste generated
- optimise the amount of waste that can be reused or recycled
- minimise the amount of waste disposed of in landfill sites.

The percentage of municipal waste sent to landfill in 2003 in selected EU countries



Notes: EU15 – excluding new accession states.
EU25 – including new accession states.

Source: Audit Scotland. Eurostat news release 30 May 2005. Excludes new accession states, Scotland data is 2003/04 data

Scotland's historic reliance on landfill has made it a challenging transition. The chart (left) shows that Scotland disposed of more waste via landfill than most EU countries. The situation has improved since 2003.



The next page shows a break down of Scotland's household waste. If you were a government minister responsible for sustainable waste management, how would you encourage Scotland to adopt the "reduce, reuse, recycle" to a larger extent?

Once you have had time to think about this question, go to this [document](#) (page 11 (as printed at the top of the page), point 30 - it looks like the screenshot (right)). This section includes ideas from other countries that have greater success with sustainable waste management.

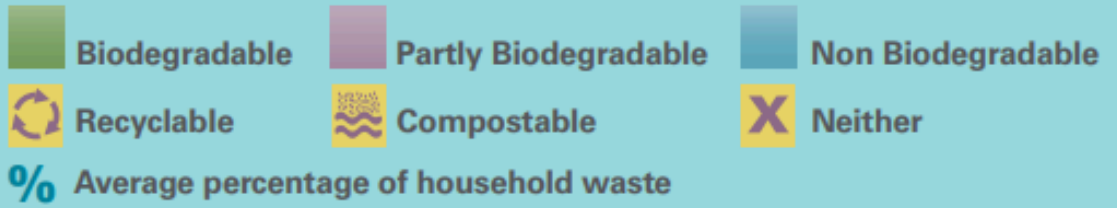
30. In 2006, consultants working for the National Audit Office⁹ identified six common features of countries that have made greater progress in reducing dependence on landfill. These are:

RECYCLE



Analysis of the contents of a typical Scottish household's waste

WASTE CATEGORY



Task: Scotland's Circular Economy

The Scottish Government aims to "make Scotland a zero waste society with a circular economy". In 2016, the Scottish Government produced their first Circular Economy Strategy. This involves a transition from using "primary resources" to changing the way we see "waste" by adopting a reuse and recycling strategy.

Let's build a circular economy

To solve big problems like climate change, waste, and pollution, we need a big idea.

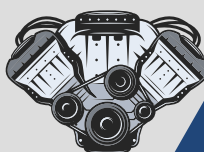
It's time to rethink how we design, make, and use the things we need, from the food we eat to the clothes we wear.

Together, we can create a better future for business, society and the natural world.

What is a "circular economy" and how does it compare to a "linear economy"? Watch this video to find out.



Watch the video with Dame Ellen MacArthur by clicking on the YouTube icon. What is the difference between the **Technical** and **Biological** cycle within the bioeconomy? **Identify** an example of a product, from the video, that has been recycled/reused in this way.



Technical cycle

Biological cycle

Recycling and the circular economy: what's the difference?

A circular economy challenges us to consider waste and pollution as design flaws

Recycling is what you might call 'end-of-pipe', while a circular economy's 'upstream' solutions address potential problems right at the source.

While recycling is undoubtedly a necessary component, we need to ensure that products and materials are designed, from the outset, to be reused, repaired, and remanufactured. It's the consequences of decisions made at the design stage that determine around 80% of environmental impacts.

Companies are already exploring ways to 'design out' waste when products are still at the concept stage.

Recycling has its limits. Watch this video and read the information in the screenshot. Using the example of an aluminium can, explain why recycling simple isn't enough.

There are various products that have been designed with a circular economy approach, e.g. a zero waste packaging made from seaweed. Can you think of your own product? There are many examples here.



Task: Waste data reporting

The Scottish Environment Protection Agency (SEPA) "help protect and maintain Scotland's vital environmental resources". SEPA state that "the most successful countries in the 21st century will be resource efficient, circular economies, which do not produce significant quantities of waste". Watch this introductory video to learn about SEPA.



With regards to waste management, SEPA state these aims:

cut waste production

keep materials circulating for as long as possible

tackle waste crime

prevent harms from waste management

Scotland needs to dramatically cut its production of waste, and industries need to rethink how they make use of raw materials. Scotland's waste industry has transformed over the past two decades, with its population recycling more than ever before.



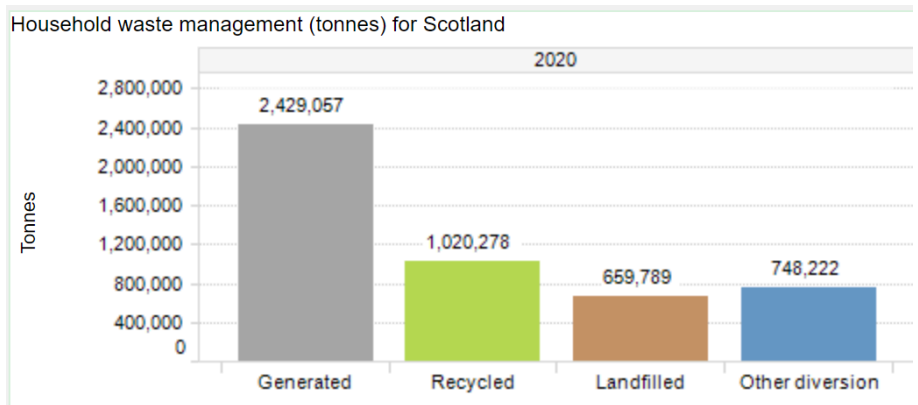
SEPA's Waste to Resources Framework

Making Things Last

Scotland's first circular economy strategy, Making Things Last, takes the targets and ambitions of Scotland's Zero Waste Plan and Safeguarding Scotland's Resources and places them firmly in the context of achieving a more circular economy in Scotland as a whole. This strategy provides a clear direction and a call for action to build on Scotland's progress in the zero waste and resource efficiency agenda.

As shown opposite, SEPA have a role in managing waste activities across Scotland. Use this interactive tool to explore domestic waste production in your local area.

Determine the percentage of household waste that is recycled and compare this to other local authority areas.





Learning Activities

SUSTAINABILITY

NQ Environmental Science - UNIT 3

N4/N5/H

The resources in this booklet have been compiled from various organisations to support learning and teaching in Scotland. If you find any additional resources that would support learning of Sustainability topics, please contact annie.mcrobbie@sserc.scot



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