Key Stage 3 Recycling Resource Pack

ZERO WASTE
LIVERPOOL CITY REGION
MERSEYSIDE RECYCLING AND WASTE AUTHORITY

Chapter 1: Why recycling matters

Key learning points:

- Understand the global context of recycling.
- Provide logic to environmental impacts that are caused by recycling.
- Become aware of poor recycling practice within a place.
- Learn examples of successful waste management.
- Understand the idea of waste streams.

Key terms:

Reduce: To make smaller in size or amount.
Reuse: Making use of an item again.
Recycling[1]**:** The act of processing used materials into new products for further use.
Recyclable[2]**:** Materials that can be processed and used again.

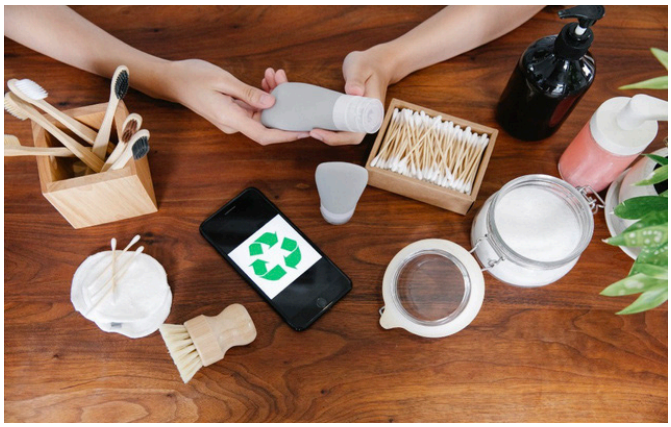
Starter Task:

Identify products that are recyclable within a pool of disposable waste items that are commonly found within the home.

This is an opportunity to learn the intricacies of recyclable materials. Perhaps there are some contradictory answers amongst pupils.

This is a chance to open debate about how complicated some products can be. Use the phone example to touch upon the complexity behind some products recyclability.

Use the image to the right as an example to be used within lesson or equally find an image that showcases a broad range of items.



From Left to Right:
Bamboo toothbrushes: they can be recycled via take-back schemes but **cannot** be put in your household recycling bin.

Ear swabs/Face pads: These items are single use by nature - are there any other options that we could use instead of single use items? Think about reusable face pads that can be put in the washer when they've been used.

Bottles: once the pumps have been removed, all plastic and glass bottles can be put in your household recycling bin.

Mobile phones have complex components comprising the model. As such, some parts may be recyclable and some not. This is the reason for designated mobile phone recycling points. As well as emphasis on trading old phones into specialist retailers.

Ask:

What else do these items have in common?

What else could be done with items like mobile phones when they're no longer wanted/needed?

The Three R's	
Reduce	Limit the amount of waste created by reducing the purchases of unnecessary items. Choose items that use less packaging and select items that have a longer lifespan to encourage consumption over a longer period of time. It's crucial to limit single-use items wherever possible.
Reuse	Repurposing items that may have normally been thrown away. This can include creating new clothes from older ones, i.e., cutting old jeans to turn into shorts. This is one of the most important activities we can take to reduce materials being unnecessarily treated as rubbish.
Recycle	If you can't reuse or repair an item, the next best step is to recycle it! Items made of paper, plastics, metals, glass and certain electronic components can be recycled into new items.

Core ideas:

Positives of recycling within the home

- Making an individual difference can add to collective movements of recycling - increasing a positive impact on ecosystems across the globe that rely on the maintenance of their habitats in the face of unsustainable resource collection (e.g., deforestation).
- When more products are made, energy is required to create them. Recycling items leads to the re-use of materials - removing the need for this energy usage.
- Equally, there is a need for water within the creation of new items. Processing products through recycling plants conserves water compared to the alternative of sourcing new materials.
- There are opportunities for education within the recycling process – adding context to why each item is recycled within school and at home -> it is necessary to add information on the linkage to environmental sustainability too.

Task:

1. **Create a poster that displays what items can be recycled and those that cannot. Be sure to include the benefits of recycling whilst including a fun and interesting design.**
2. **If in doubt, visit recycleright.org.uk to check what can and can't be recycled at homes across the Liverpool City Region.**
3. **Make a list of items you can see around the classroom or in your home. Can you decide whether each item is recyclable or not? Think outside of just recycling at home, but visiting a household recycling centre, or another recycling point. Once you have decided, can you justify the answer? What reason can you give for your selection?**

Classroom Activity:

A classroom sorting activity where students categorise different items into recyclable and non-recyclable groups.

Discuss the environmental impact of each choice and once you have categorised them can you detail whether the waste streams you have created are sustainable or unsustainable?

Give reasons for your answer.

Chapter 2: Environmental Impact of Recycling

Key learning points:

- Identify typical recyclable and non-recyclable items.
- Positives of recycling in the home.
- Provide an overview on the importance of recycling.
- Understand the idea of waste streams.

Starter Task:

Ask pupils how their waste is collected at the moment.

- Do services come and collect their bins?
- Do they empty their bins into communal waste bins?
- Do they sort waste in their home?

After some consideration students could be asked to discuss their answers with classmates in a group setting. It is crucial that students understand that the ability to collect all waste streams effectively is not universal across the world. Please consider showing pupils a separate multi-media file to showcase waste management that is ineffective.

Below is a video which shows students how recycling across the Liverpool City Region is managed and processed:

https://www.youtube.com/watch?v=wQ4PG-5unKg

Key terms:

Biodiversity[3]**:** Variety of living species on earth.
Habitat[4]**:** The natural environment in which an animal or plant usually lives.
Greenhouse Gases[5]**:** Gases such as water vapour, carbon dioxide, and methane in the Earth's atmosphere that trap heat.

For older age groups in KS3 perhaps show them the following video:

https://youtu.be/KHiHBuubsDE?si=KYLXpv7DRJdEuczK
to showcase a more complex ineffective waste stream.

Core Idea:

Waste is a global issue. When streams are not managed effectively, the results/impacts can be catastrophic for local people, wildlife, and habitats.

As such it is crucial to understand the impacts of not recycling and dealing with waste effectively, in order to understand the importance of managing waste efficiently.

In the UK, communities are likely to have their bin collected by council services. Some novel ideas include waste management in Kensington, Liverpool
https://www.bbc.co.uk/news/ukengland-merseyside-63118027

Core Idea:
An example of successful waste stream management.

Subaru is a car company in Indiana, USA. Since 2004 their effective waste management has led to zero-landfill status, meaning that all their potential waste is reconstructed into other car parts or used to produce electricity, with no materials being sent to landfill.
https://www.subaru.com/our-commitment/love-promise/subaru-loves-the-earth

If students struggle to grasp the idea of zero-landfill status, perhaps it is useful to demonstrate that if all materials within an item are recycled effectively then none of the materials are treated as rubbish, thus, the waste stream is 100% accounted for.

Classroom Activity:

Ask some pupils to represent a phone company that throws away products everyday.

Can this group of students name environmental issues associated with the dumping of items that contains many components/chemicals?

Can another group of students that represent an environmental organisation offer points of remedy/mitigation?

Refer to news stories and investigative journalism that displays ineffective management of waste streams.

This is an opportunity to offer some outside of the classroom work:

Can students find their own news story covering effective waste management that has led to positive environmental progress (e.g., air quality increase)?

Chapter 3: Recycling and the Carbon Cycle

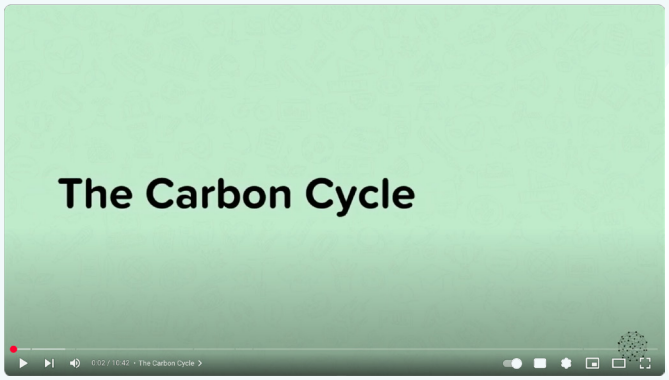
Key learning points:

- Understand the carbon cycle process.
- Investigate the link between recycling and the carbon cycle.
- Acknowledge that the relationship between recycling and the carbon cycle can be positive or negative dependent on the impact.

Starter Task:

Watch this video on the carbon cycle. This video should be paused at regular intervals to allow questions and curiosities.

Please take this chance to offer an insight into the carbon cycle that disrupts the flow of the video – keeping students engaged:



https://youtu.be/WNWstCstODE?si=5ZczeUcFujey0c8f

1. Carbon Dioxide (CO_2) exists in the air that surrounds us.
2. Plants use this to make food through photosynthesis.
3. Animals eat these plants, consuming carbon.
4. When animals breathe out, they release CO_2 back into the air.
5. When animals die and decompose (break down), they release CO_2 into the air.
6. After a long period of time, these decomposed animals turn into fossil fuels like coal oil and gas.
7. Fossil fuels are then burnt for energy (e.g., coal power stations) – releasing CO_2 into the air.

Key terms:

Greenhouse Effect[6]**:** Phenomenon where gases allow sunlight to enter Earth's atmosphere but make it difficult for heat to escape.
Fossil Fuels[7]**:** Fossil fuels are made from decomposing plants and animals. These fuels are found in Earth's crust and contain carbon and hydrogen, which can be burned for energy.

If recycling is completed more often, less new products must be made, reducing the need to burn fossil fuels and release more carbon into the atmosphere.

Recycling gives us the opportunity to make a difference to the carbon cycle. If we can dispose of materials without incineration (burning of waste) and other traditional burning of waste methods, the carbon dioxide that would have been released if this had occurred is saved from entering the atmosphere and negatively impacting the globe.

Each human can be seen as responsible for their carbon footprint. Therefore, the action of recycling is certainly a method of reducing individual's impact on the carbon cycle. The combined effort of recycling and encouraging others to do the same can push materials into the correct waste stream, removing the incineration and dumping of waste into unsustainable waste streams therefore reducing carbon emissions.

The environmental impact of carbon release is widely understood. Linkage to climate change can be made here if pupils are privy to this knowledge. In a KS3 context there can be constant reference to the idea that if plants and wildlife population numbers drop, then there will be more CO_2 remaining in the atmosphere, and this ultimately impacts the greenhouse effect which drives climate change.

Term:	Definition:
Photosynthesis:	Process by which light energy is converted into food by plants and algae. Carbon Dioxide + Water → (Sunlight) Glucose + Oxygen
Decomposition:	Action of decay or breaking down. In the carbon cycle context, as an organism rots this action releases carbon.
Incineration:	The action of burning waste.
Carbon Emissions[8]:	The release of carbon compounds such as carbon dioxide (CO2) and methane (CH4) into the atmosphere.
Climate Change:	A change in global or regional climate patterns, linked to the rise in carbon dioxide as a result of burning fossil fuels for energy.
Global Warming:	An increase in temperature of the earth's atmosphere. Research has shown that there is a link between a rise in carbon dioxide in the atmosphere and this global warming effect.
Respiration:	Occurs in living organisms. Intake of oxygen and the release of carbon dioxide.
Energy from Waste:	The process of converting waste materials into usable energy, often electricity and heat.

All these terms and concepts are key to understanding the carbon cycle and its relationship with recycling. They form a vital knowledge base to learning about this as pupils enter KS4.

Let's refocus the session back towards how the carbon cycle impacts recycling.

Recycling reduces the demand for more products to be made. In turn this reduces the amount of energy needed from burning fossil fuels to make the items!

- Recycling paper means that less trees must be cut down and therefore increases the amount of CO2 in the atmosphere.
- Recycling food waste can create compost! Absorbing carbon in the process creating cleaner air.

Classroom Activity:

Can pupils understand that recycling can have positive AND negative impacts on the carbon cycle?

Perhaps ask students to create a table with two columns and give them time to provide answers that.

Consider the relationship that humans have with the environment. Is it always positive or negative?

Chapter 4:
Changing Recycling Attitudes

Key learning points:

- To promote questioning around how recycling initiatives begin.
- Investigate the current attitudes to recycling.
- Use place examples to provide a case study of successful attitudes and then provide alternative negative attitudes to recycling.

Key terms:

Misinformation[9] – wrong information, or the fact people are misinformed.
Incentive[10] – something that encourages someone to do something.
Demographic[11] – the study of populations and the different groups that make them up.

Starter Task:

Please show the image below of coloured items providing a pot for plants in different gardens.

Consider the thinking that has gone into this.

Make a list of the benefits of this idea for the environment and for people around the world if more communities decided to do this.

Core Idea:
Attitudes to recycling are formed by people's experience with waste and their relationship with the environment.

For example, people that are taught about how to care for the environment and how crucial its functioning is for ecosystems across the globe are more likely to treat it with respect and courtesy, discarding of any waste in the correct waste channel (e.g., recycling recyclable waste because they know the impacts if recyclable plastic ends up in oceans).

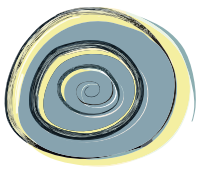
Therefore, it is the way in which we inform and teach people of waste issues, that we can educate communities on how to treat their waste appropriately. The methods in which we can do this differ and are often unique:

- Education classes at community centres
- Leaflet distribution
- Television adverts
- Podcasts and social media posts

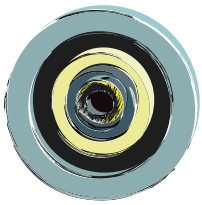
When local councils, governments, businesses, or community groups begin the creation of a recycling scheme their outcomes can be determined by:

- The amount of waste recycled.
- Whether the project inspires more people to recycle.

Sharing new ideas



Challenging bad practices



Creating incentives

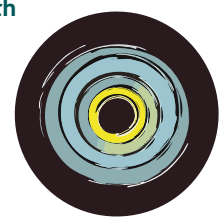
It is the effectiveness of the project in changing minds on the waste dilemma that can have positive impacts far more reaching and broader than a local recycling scheme – as the impacted communities can implement their own environmentally aware recycling ideas in their own homes and share with friends.

Community projects can share new ideas about how to recycle and engage with seldom-heard groups, as well as challenging bad practice (when communities implement waste schemes that are not effective) with creative solutions, whilst also creating ways in which communities can benefit from participating in recycling schemes.

Let pupils consider the phrase 'Seldom-heard groups' as an introduction to communities that are often forgotten about when decision making takes place. Seldom-heard groups refer to underrepresented people who use or might potentially use social services and who are less likely to be heard by social service professionals and decisionmakers

What ideas can pupils provide to engage with these Seldom-heard groups to include them in the recycling conversation?

How can recycling projects engage with hard-to-reach people?



Engaging with schools

Online forums

Social media ads

Visual displays

Distributing leaflets

Podcasts and radio appearances

Providing information at places of worship

Task:

Ask students the follow question

"How can we change perceptions of recycling?"

Open a discussion within the classroom. Forming two opposing sides. The teacher/ supervisor will take the view that recycling is useless.

The students will form the latter, allow them to raise stats and case studies of successful projects to showcase that education can inform a change in attitude.

Classroom Activity:

Can you identify what demographic is best suited to each method of engagement that is outlined?

For example; social media posts are traditionally accessed by younger people and therefore the method behind this technique is to engage young people in the project.

When climate change misinformation is published, confidence in projects and schemes that combat climate change decreases. It is vital that all our information is fact-checked to avoid this negative impact.

In the context of recycling, we can positively impact the environment through engaging with effective recycling schemes and plans – dealing with our waste streams effectively.

To encourage participation in recycling projects through informing communities and people we interact with about climate change, we can raise awareness of the pieces of the puzzle that we can change and shift to better our environment – recycling is one such piece.

Quick Fire Questions

1. **How is the carbon cycle and recycling connected?**
2. **In what ways can recycling have a positive impact on communities and the environment?**
3. **What is an effective and ineffective waste stream?**

Create your own recycling project. What will you do to make a difference in your community. Choose who you want to get involved and choose what method you will use to target them specifically. What option will you choose to maximise engagement?

Chapter 5: Recycling Worksheet

Key learning points:

- To promote questioning around how recycling initiatives begin.
- Investigate the current attitudes to recycling.
- Use place examples to provide a case study of successful attitudes and then provide alternative negative attitudes to recycling.

1. What is recycling?

2. How can humans reduce their impact by recycling?

3. How is the carbon cycle linked with recycling?

4. How can we positively reduce the impacts of climate change?

5. What is an example of a good recycling practice?

6. What is an effective waste stream?

7. With an example, explain an ineffective waste management strategy and its impacts on social environmental and economic factors?

8. What are the 3 R's?

9. How can recycling projects that target communities positively impact recycling attitudes?

10. What is an unsustainable waste stream?

Appendix: References

BBC Bitesize (2024) Greenhouse Gases and Climate Change. [5]
Available at: https://www.bbc.co.uk/bitesize/articles/zq2m2v4#z8x6xbk (Accessed: 3 March 2024).

Cambridge Dictionary (Nd, a) Habitat Definition. [4]
Available at: https://dictionary.cambridge.org/dictionary/english/habitat (Accessed: 24 March 2024).

Cambridge Dictionary (Nd, b) Misinformation Definition. [9]
Available at: https://dictionary.cambridge.org/dictionary/english/misinformation (Accessed: 1 March 2024).

Cambridge Dictionary (Nd, c) Incentive Definition. [10]
Available at: https://dictionary.cambridge.org/dictionary/english/incentive?q=INCENTIVES+ (Accessed: 4 March 2024).

Cambridge Dictionary (Nd, d) Demographic Definition. [11]
Available at: https://dictionary.cambridge.org/dictionary/english/demographic (Accessed: 24 March 2024).

Collins Dictionary (Nd, a) Recyclable Definition. [2]
Available at: https://www.collinsdictionary.com/dictionary/english/recyclable (Accessed: 3 March 2024).

Collins Dictionary (Nd, b) Recycling Definition. [1]
Available at: https://www.collinsdictionary.com/dictionary/english/recycling (Accessed: 3 March 2024).

EcoLife (nd) Carbon Emissions Definition. [8]
Available at: https://www.ecolife.com/dictionary/carbon-emission (Accessed: 07 March 2024).

National Geographic (2023a) Greenhouse Effect. [6]
Available at: https://education.nationalgeographic.org/resource/greenhouse-effect/ (Accessed: 2 March 2024).

National Geographic (2023b) Fossil Fuels. [7]
Available at: https://education.nationalgeographic.org/resource/fossil-fuels/ (Accessed: 2 March 2024).

National Geographic (2024) Biodiversity: Encyclopaedic Entry. [3]
Available at: https://education.nationalgeographic.org/resource/biodiversity/ (Accessed: 1 March 2024).

This content was developed by The Big Help Project alongside MRWA.