Waste Breakdown

Teacher Notes

Secondary (7-10)

ACTIVITY DESCRIPTION

The Waste Breakdown activity raises awareness of the time required for waste materials to break down and how this can take many years, especially in landfill where air, water and light are scarce. Students consider different materials, their properties and characteristics, in order to allocate them a correct timeframe for breaking down in a landfill site. Students are then invited to consider design solutions or alternatives based on the 5Rs: Rethink, Refuse, Reduce, Reuse and Recycle.

INSTRUCTIONS

1. Brainstorm

Spend a few moments brainstorming the waste items that we commonly dispose of into landfill.

2. Put the timeline together

What happens once these items are in landfill? Look at the cards you've been given of various waste materials. Allocate each object to the correct time frame you think it would take for the item to break down in landfill.

3. Discussion

1. Which items are fastest to break down? Provide one possible reason for why this is the case
2. What are the impacts of landfill on our environment? Consider both the short-term and long-term impacts
3. Next to each item on the timeline, allocate an estimated 'time-in-use', i.e. how long the item may have been used before being discarded. How does this compare to its landfill life span?
4. Choose **one** of the following objects and suggest ways we could Rethink, Refuse, Redesign, Reduce, Reuse or Recycle this object:

- Plastic bags
- Aluminium can
- Plastic bottle

SUGGESTIONS FOR ASSESSMENT

Formative

1. Participation in the Waste Breakdown activity
2. Participation in the Discussion questions above

CERES SCHOOL OF NATURE AND CLIMATE

BACKGROUND NOTES

Many materials that end up in landfill break down at a very slow rate. This is a significant problem that is compacted by the rapid rate of consumption and disposal of items in our society.

Many materials that end up as waste contain **toxic substances** that become environmental hazards. According to Environment Victoria, electronic waste items, for example, may contain mercury, arsenic, cadmium, PVC, solvents, acid and lead. **Leachate** is the liquid formed when waste breaks down in landfill and water filters through that waste. It can pollute the land, ground water and water ways.

Another significant problem with landfill is organic waste. When organic materials such as food scraps and green waste are put in landfill, it is generally compacted and covered. This removes oxygen and causes it to break down in an anaerobic process, thus releasing **methane**, a greenhouse gas that is 22 times more potent than carbon dioxide. This has significant implications for global warming and climate change, as 40% of our landfill waste is organic.

ACTIVITY SOLUTIONS

Waste item	Approximate biodegradability of objects in landfill
Piece of paper	2 - 6 months
Orange peel Timber Woollen socks	1 - 5 years
Plastic coated paper	5 - 7 years
Plastic bags	20 - 100 years
Aluminium can	80 - 100 years
Plastic bottle	Up to 10,000 years

ACCESS THIS ACTIVITY

Visit the **CERES School of Nature and Climate website** to download the activity - https://sustainability.ceres.org.au/education-resources/curriculum-activities/

Curriculum and RSS Links

KEY CONCEPTS

Landfill, Food Waste, Plastics, Biodegradability, 5Rs (Refuse, Rethink, Reduce, Reuse, Recycle)

KEY LEARNING INTENTIONS

1. Understand how long items remain in landfill and their impact on our environment over time
2. Develop a greater understanding of different material resources, their properties and characteristics
3. Explore waste solutions and alternatives through closed-loop systems, redesign, and/or the 5Rs (Rethink, Refuse, Reduce, Reuse, Recycle)

VICTORIAN CURRICULUM

Science

7 - 8
Some of Earth's resources are renewable, but others are non-renewable (VCSSU100)

Geography

9 - 10
Effects of the production and consumption of goods on places and environments throughout the world and including a country from North-East Asia (VCGGK142)

Design & Technologies

7 – 8	9 – 10
Examine and prioritise competing factors including social, ethical, economic and sustainability considerations in the development of technologies and designed solutions to meet community needs for preferred futures (VCDSTS043)	Critically analyse factors, including social, ethical and sustainability considerations, that impact on designed solutions for global preferred futures and the complex design and production processes involved (VCDSTS054)

CERES SCHOOL OF NATURE AND CLIMATE

SUGGESTED RESOURCESMART SCHOOLS MODULE LINKS

Undertaking the activity as described above links to the *ResourceSmart Schools Waste Module - actions B1.2, B1.3*

Below is a list of extension activities that link to additional actions of the Waste module:

1. Students undertake a litter survey of the school grounds and estimate how long it will take for each piece of litter to break down in the environment *(ResourceSmart Schools Waste Module - actions A1.2, B1.3)*
2. Students undertake a general waste bin audit and create recommendations based on contamination and opportunities to minimise waste to landfill *(ResourceSmart Schools Waste Module - actions A1.1, B1.3, C2.1)*
3. Students run a Nude Food lunch day at school to raise awareness around packaging and waste. Follow up with a whole school community survey to investigate opportunities to hold these on an ongoing basis *(ResourceSmart Schools Waste Module - actions A3.1, A3.2, B1.4, C1.2, C2.1)*
4. Invite local indigenous group/s to share their perspectives on waste and traditional uses of resources within an ecosystem *(ResourceSmart Schools Waste Module - actions B1.5, B1.6)*
5. Students write a learning story about key findings of the activity and share in your school's newsletter and website, including recommendations for waste minimisation at school and at home *(ResourceSmart Schools Waste Module - actions C1.1, C1.3, C3.5)*
6. Students undertake the Plastic Free July challenge to eliminate as much plastic from their lives at both school and at home, learning new skills to create their own products where possible (e.g. toothpaste, cleaning products, etc.). Include ideas and tips in the school newsletter throughout the month of the challenge *(ResourceSmart Schools Waste Module - actions C3.3, C1.1, C1.3)*
7. Run a drive at the school to collect materials for social support and/or charity. Items could include clothing, used furniture, bikes, toys and other goods *(ResourceSmart Schools Waste Module - actions A6.3, C1.1, C3.3)*
8. Start a phone drive or collection bin for electronic waste materials at the school. You can partake in projects such as Melbourne Zoo's campaign 'They're Calling on You' *(ResourceSmart Schools Waste Module - actions C3.3, A6.3)*

Speak to your CERES ResourceSmart Schools Facilitator about further links to the Waste Module.