

Lesson Plan

What happens to food waste?

Year Group: 3-4

National Curriculum links: Science - recognise that soils are made from rocks and organic matter; solids, liquids and gases; and examples of human impact (both positive and negative) on environments.

Summary: In this lesson, students will gain knowledge of what happens to food waste in north London. They will investigate how food waste can be transformed into compost. Students will be tasked with creating a mini composter to investigate the process of composting or create a composting fact file.

Prior learning required: Students need to have an understanding of the the causes and problems with food waste. Students should have some understanding that soil is comprised of organic materials and the difference between solids, liquids and gases.

Learning objective: To investigate how food waste can be turned into compost.

Success criteria:

- I can explain the impact of food waste on the environment.
- I can explain how food waste is managed in north London.
- I can explain how to create your own compost from food waste.

Prepare before the lesson to create your own compost:

1 or 2L empty plastic bottle (to make it easier, pre-cut the top of the bottle off)
Green food waste (fruit peelings, vegetable peelings, grass cuttings)
Brown waste (dried leaves, ripped newspaper, egg shells, egg carton)
1 sheet of kitchen roll
Spray bottle filled with water

Lesson outline

Slide 3: Ask students to write a 15 word summary of the problems caused by food waste. Answers include: waste of natural resources, decomposition releases methane.

Slide 4: Introduce key words. Microorganism is a living thing that can only be seen using a microscope. This includes bacteria and fungi. (California Academy of Sciences, 2024)

Slide 5: In pairs, discuss what would happen to the apple core and orange if you left it for a week.

Slide 6: Mould is a type of fungi. Fungi and bacteria (micro-organisms) begin to break down the food to turn it back into organic materials; it's a type of natural recycling. Extension question: what would happen if you put in the playground or in the freezer? (Temperature, oxygen and water all speed up the process of decomposition. That's why if you freeze something, it doesn't spoil as it slows down the bacteria and fungi (mould))

Slide 7: We produce a lot of food waste in north London and it makes up around 32% of our black bin waste (NLWA,2023). If we put all of these food waste into landfill, it would release all the methane into the atmosphere and contribute towards climate change. This is because in landfill, oxygen is removed and causes anaerobic composting.

Food waste and green waste in north London is collected by most boroughs and sent to an anaerobic digester. This process removes the oxygen and uses bacteria and microbes to break down the green waste. This releases methane which is turned into biogas and also produces digestate (leftover solids) which is used in fertiliser. The fertiliser can be used to improve the soil nutrient levels. You may want to show Bioenergy Devco's video (please note NLWA do not own the rights to this video and are not responsible for the content) <https://youtu.be/cq18xVf9IAk>.

Slide 8: Use the slide notes to explain the process of composting. This can be done at home and is a form of aerobic composting, where oxygen is present. It does produce carbon dioxide as part of the process which is less harmful than the methane produced by placing it in landfill.

Slide 9: Introduce the compost experiment. Ask students to note down their predictions to the questions on the slide. With this activity, you may want to produce one composter or have children work in small groups.

Slide 10-13: Model each step. On steps 3-5, explain that we need 'brown' waste and 'green waste' to create our compost. Green waste supplies the nutrients for good compost and brown waste contains carbon which is a good food source for the microbes and bacteria that help break the waste down. Brown waste also bulks out the compost pile and allows air to pass through.

Slide 14: Ask students to draw a diagram of what their compost bin looks like. Complete these at regular intervals (1 or 2 weeks).

Slide 15: Share the compost fact file activity. Students need to find the answers to the following question and compile a fact file about compost. You may want to provide tablets, laptops or information books for students to conduct their research. Ensure they give reasons for their answer.

Slide 16: Ask students to discuss whether they agree or disagree with the statement.

Differentiation

- You could investigate how different conditions affect the composting process. For example, you could look at sunlight, temperature, proportion of green to brown waste, or moisture levels.

Follow up activities

- Use the compost you have created to help grown new plants.
- Create a wormery to compare the two processes and see which is quicker.