

STEAM Education & Leadership Workshops:

Lesson Plan - Waste-Free Kitchen — Eat Smart and Save the Planet

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Age range

10-13 years old

Learning objectives

Students will be able to:

- Explain what food waste is and its environmental impact.
- Observe, measure, and analyze how much food is wasted.
- Design a creative and practical solution to reduce waste at home or in school.
- Present their “Zero-Waste Kitchen” ideas using STEAM skills

Structure of the lesson

- Understand what food waste is and collect real or simulated data about it.
- Data Collection Activity: “What’s in Our Bin?” (Real observation and data collection)
- Reflection (circle discussion)
- Brainstorming solutions
- Creation: Design Your “Zero-Waste Kitchen” (a visual or 3D model of their waste-free kitchen).
- Presentation & Reflection

Duration

120 Mins

Note to Educators

Connect to Students’ Lives

Use examples from students’ homes, school, or community to make food waste relatable. Highlight local issues in your context, like leftovers thrown away by cafeterias or household food waste, to build ownership and relevance.

Adapt to Different Learning Styles

Incorporate visual aids (images or short clips of food decomposition), hands-on activities (observing and recording wasted food, creating mini kitchen models), and discussions to cater to diverse learners.

Promote Reflection and Responsibility

Guide students to reflect on their own habits and set personal goals to reduce food waste. Encourage sharing in a safe, supportive environment where every idea is valued.

Foster Collaboration and Creativity

Encourage teamwork during the entire activity, from data collection, brainstorming, and model-building and reflection activities. Highlight that creative solutions and collective efforts can make a real environmental difference.

Resources

- Slides: [Waste Free kitchen: Eat Smart and Save The Planet](#)

Timing	Facilitator's actions	Students' outcomes	Technical notes
0-15 mins	<p>Introduction to food waste</p> <p>Ask an engaging question: "Have you ever wondered what happens to food after we throw it away?"</p> <ul style="list-style-type: none">• Show a short clip or a picture carousel titled "The Journey of Wasted Food. Then ask guiding questions to spark curiosity.• Introduce the concept of food waste, defining key ideas such as edible waste, avoidable vs. unavoidable waste.• Explain the science behind what happens to wasted food, like biological decomposition, rot, greenhouse gas release, and use local examples.• Facilitate a class discussion by asking students to share their experiences with food waste and recycling.	<p>Awareness and connectedness:</p> <p>Focus: Perspective taking, Sense of identity, metacognition, and social awareness</p> <p>Students gain awareness of what food waste is, different types of waste, and their environmental impact.</p> <p>Students share different experiences about how they have witnessed food waste at home or school.</p> <p>Students connect waste management concepts to real-life examples and their community. They participate actively by sharing personal experiences.</p>	<p>Use simple language and visual aids (e.g., printed images or short clips) to make concepts easy to understand.</p> <p>Prepare guiding questions ahead of time to keep students engaged and encourage discussion.</p>
15-45 mins	<p>Data collection activity: What's in our bin?</p> <ul style="list-style-type: none">• Explain the activity: Students will act as Eco-Researchers, observing	<p>Mastery, Agency and Wellbeing:</p>	<p>Use clear labels and separate bins for the data collection.</p>

	<p>real food waste during snack or lunchtime and recording their findings using a simple Food Waste Chart (type of food, quantity, reason, notes)</p> <ul style="list-style-type: none"> ● Guide the investigation: Arrange students into small groups to ensure everyone participates. ● In groups of 3–4, students collect data with teacher supervision, then total the amounts wasted and represent the results using a bar graph or pie chart to visualize which foods are wasted most. ● Ask reflective questions: “What food is wasted the most?” “Why do you think this happens?” “What small changes can we make to reduce this waste?” 	<p>Focus: Curiosity, Collaboration, Self sufficiency, Sense of belonging, security, empathy and optimism</p> <p>Students develop critical thinking and categorization skills by analyzing and evaluating types of food waste. Students feel confident and secure in a collaborative learning environment while discussing solutions to reduce food waste.</p>	<p>Practice Safety: Students should wear gloves when handling food waste or bins.</p>
45-60mins	<p>Guide reflection:</p> <p>Discuss the data from the Food Waste Chart in a circle, connecting numbers to real-life impact, linking math skills with environmental awareness.</p>	<p>Awareness and Mastery: Focus: metacognition and foundational knowledge.</p> <p>Students develop awareness of the environmental impact of food waste by reflecting on their collected data and seeing how small daily actions add up over time.</p> <p>They not only understand the impact of food waste but also gain the skills to analyze the problem and create new opportunities for solutions</p>	<p>Use concrete examples: Pick one type of food from their chart</p> <p>Resource Cycling: Diverts organic matter from landfills, preventing methane gas (CH₄) emissions and creating compost for nutrient-rich soil amendment</p>
60-100 mins	<p>Brainstorm solutions:</p> <p>Idea generation</p> <ul style="list-style-type: none"> ● Guide students through a structured brainstorming session focusing on reducing food waste at home and school. This includes prompting 	<p>Mastery: Focus: Critical thinking, leadership, global mindedness, and collaboration</p> <p>Students develop critical thinking and problem-solving skills by generating practical</p>	<p>Use safe recycled materials like cardboard, bottles, paper rolls, and colors for designing the Zero Waste Challenge.</p>

	<p>them to share ideas on effective meal planning, reusing leftovers, and introducing them to the "Zero-Waste Kitchen Challenge" where they design a future kitchen environment to eliminate waste. Offer examples of achievable strategies to inspire their thinking.</p> <p>Design and Build a Mini Waste-Free Kitchen</p> <ul style="list-style-type: none"> Have students apply their ideas by designing and constructing a mini, waste-free kitchen model using recycled materials (e.g., cardboard, bottles, paper rolls). Encourage them to incorporate creative, practical solutions like a "Leftover Shelf" or a designated composting area to demonstrate real-world food waste reduction. <p>Presentation and Explanation</p> <ul style="list-style-type: none"> Circulate during the building phase to encourage creativity, prompt further ideas, and ensure safe material use. Conclude the activity by having students explain how each feature in their mini-kitchen helps reduce food waste and how those features connect to real-life, achievable solutions. 	<p>solutions to reduce food waste, such as transforming leftovers into new dishes, meticulously planning and buying only the necessary food quantities, and constructing a functional model of a waste-free kitchen.</p> <p>Agency:</p> <p>Students foster curiosity and creativity by taking an active role in designing a zero-waste kitchen model.</p> <p>This process also fosters initiative as students make independent choices about the materials and features for their model.</p> <p>Connectedness:</p> <p>This activity encourages student collaboration and idea sharing, linking personal actions to their impact on family and community.</p>	<p>Inventory Management: Increases visibility and prioritization of food items nearing spoilage</p>
<p>100-120 mins</p>	<p>Reflection and Closing:</p> <p>Gather students for a reflective discussion focusing on key takeaways: "What was the most interesting or surprising thing you learned about food waste?" Provide encouraging feedback to motivate participation</p> <p>Challenge each student to set a specific personal goal to reduce food waste, such as committing to finish their lunch, intentionally saving leftovers, or planning snacks mindfully.</p>	<p>Wellbeing awareness and Agency:</p> <p>Students develop a sense of accomplishment and belonging by sharing ideas and setting achievable personal goals to reduce food waste within a supportive peer environment.</p> <p>Students reflect critically on their personal habits, understand their contribution</p>	<p>Food Preservation: Extends the shelf life of ingredients and leftovers by reducing exposure to oxygen and contaminants.</p>

	<p>Wrap-up: Emphasize the students' vital role as young leaders in environmental stewardship. Highlight that their small, daily actions to reduce food waste can collectively make a significant difference.</p>	<p>to food waste, and recognize their essential role in environmental stewardship</p> <p>Students commit to taking proactive individual and collective actions to achieve measurable food waste reduction</p>	
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