Taking a Bite Out of Lunchroom Waste

Lesson 4: How can we reduce the amount of trash produced from school lunches?

Anchoring Phenomena:

How can we **reduce** marine debris?

Investigative Questions:

What are things we can do to reduce our lunchroom waste?

Lesson Goal:

What students will do: Students will share their ideas with each other and their community partner(s) about how to reduce the amount of trash produced in their school lunchroom. Students will decide which ideas for reducing lunchroom trash they want to research. Students will build a plan, do research and write a feasibility report to determine the cost of changing what they do in the lunchroom.

What students figure out:

- Ways they think they can reduce lunchroom waste and share this with others
- The questions they need to answer during their research
- Who they need to talk to when doing their research
- How to develop a plan for the research
- How to develop their feasibility report

NGSS Alignments

Investigative questions	Grade Level Performance Expectations	Disciplinary Core Ideas	Science and Engineering Practices	Cross-cutting concepts
How can we reduce the trash produced?	**K-ESS3-3 Earth and Human Activity -** Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment. **5-ESS3-1 Earth and Human**	ESS3.A Natural resources	1- Asking questions (for science) and defining problems (for engineering)	1- Patterns 2 - Cause and effect 7 - Stability and change

	Activity - Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment. **MS-ESS3-3 Earth and Human Activity -** Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. **MS-ESS3-4. Earth and Human Activity -** Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems **HS-ESS3-1 Earth and Human Activity -** Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity. **HS-ESS3-4. Earth and Human Activities -** Evaluate or refine a technological solution that reduces impacts of human activities on natural systems		3 - Planning and carrying out investigations 8 - Obtaining, evaluating and communicating information.	

Materials:

sticky notes (3 per student)

Lesson Prep:

Review the BEETLES Question Strategies video

Review Gallery Walk activity video

Decide if the research will be the whole class or small groups. Will there be multiple avenues of research for the same item? Will each small group research a different item? Determine how many presentations will be made to decision makers.

Lesson Steps:

Invitation

1. Revisit the BIG idea: How can we reduce marine debris?
2. Reflection now and at the end: ask students to brainstorm in their journals: "How can I help reduce marine debris and the amount of trash produced in our lunchroom?"

Exploration: How can we reduce the amount of lunch trash produced?

3. During the last session youth ended by recording in their journals one item of school trash they think could be reduced. Begin by asking for volunteers to share the item they thought could be reduced, but ensure everyone contributes at least one item. This is an opportunity to facilitate student voice. All ideas are good ideas.
    a. Record the items identified by the students where everyone can see.
    b. Revisit the data and ask questions to add to the list as needed
        i. What was the most common type of trash item produced?
        ii. What are the most common non-food waste items produced?
        iii. Are there ways to reduce food waste?

Concept Invention: Identify target items for waste reduction

4. Use questions to help students select the item(s) they want to research in an effort to reduce the amount of trash going into the landfill.
    a. Why do you think this was the most common item?
    b. Is there an alternative for this item or could the process of how the item is distributed be changed to reduce waste?
    c. How can we reuse items so they do not become trash?
5. Identify the item(s) to be targeted for reduction
    a. Identify the questions needed for their specific feasibility plan, a type of persuasive argument. Use the Feasibility Study Ideas to aid in this process. You can also provide your student with a copy of the Feasibility Study worksheet to help complete their feasibility study.
        i. What questions need to be answered and by who
        ii. Who has the power to make the change
        iii. Are their existing rules that need to be explored
        iv. What would be the change?
        v. What might the barriers to the change be?
6. After plan(s) have been developed either have students verbally present their plans or post them for everyone to read.
    a. After all the presentations provide time for a gallery walk giving students sticky notes to use to provide feedback. To reduce waste, you could also use whiteboards or virtual sticky notes. A gallery walk encourages student voice and reflection even if there is only one plan.

i. Assign specific students to provide feedback on each plan so all plans receive feedback.
ii. Use sticky notes for different prompts. For older students, this can be more open ended, elementary students will likely need scaffolding. Sticky note prompts examples:
    1. Explain more...
    2. I have a question about...
    3. I really like....

Application

7. Youth begin researching solutions - alternative ways to reduce a “specific” waste they have identified. Using the plan they developed above and the comments from their peers.
    a. Are there different ways to manage our waste than sending it to a landfill?
        i. Food waste: Compost? (Industrial, Vermicompost?)
        ii. Non-food waste: Use the Decision Tree from Lesson 1
    b. Are there ways within our community to “close the loop” so that items do not go to the landfill? * Recommended for MS and HS especially if the school has a marketing or agriscience program.
        1. Can closable containers be reused by crafter, local hardware stores to package birdseed? Beads? Or other items?
        2. Can we work with our agriscience program to use the food waste? Or partner with local farmers?
    c. What is our current cost? What would be our future cost?
8. Youth synthesize the data they collected - alternatives, cost analysis, for changing the “specific” waste item resulting in less waste.
9. Youth complete their communication products (persuasive argument).
    a. Products might be a persuasive presentation/poster/social media post/infographic or page/blog/newsletter/video/etc with the goal of sharing their data and changing the behavior of others to reduce waste! (This goes beyond just lunchroom waste!)
    b. Example: Students create a presentation based on what they learned to "challenge" others in the school to reduce lunchroom waste. After the presentation youth share their alternative plan with other students, relevant partners and the public.

Reflection

10. In their journals, ask students to add to their initial brainstorming: “How can I help reduce marine debris and the amount of trash produced in our lunchroom?”

💧 Great Lakes Literacy Principles Connections:

(6) The Great Lakes and humans in their watersheds are inextricably interconnected.