Taking a Bite Out of Lunchroom Waste

Lesson 3: How much trash is produced in our lunchroom?

Anchoring Phenomena:

How can we **reduce** marine debris?

Investigative Questions:

Where is trash produced in our school?
How much trash is produced in our school lunchrooms?

Lesson Goal:

What students will do: Students will investigate where the trash is produced in their school and compare it to the trash produced at home. Students will investigate how their school manages trash. Students will audit what type and how much trash is produced in their school lunchrooms.

What students figure out:

- How much trash is produced in their school lunchroom
- The types of trash produced by their school lunchroom
- Students begin thinking about how they can reduce the trash produced in their school lunchroom.

NGSS Alignments

Investigative questions	Grade Level Performance Expectations	Disciplinary Core Ideas	Science and Engineering Practices	Cross-cutting concepts
Where is trash produced in our school?	**4-ESS3-1. Earth and Human Activity -** Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.	ESS3.A Natural resources	1- Asking questions (for science) and defining problems (for engineering)	1- Patterns 2 - Cause and effect 7 - Stability

	MS-ESS3-3 Earth and Human Activity - Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. **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.	and change

Materials:

Lunchroom audit printouts, clipboards

Lesson Prep:

For the lunchroom waste audit, select either the class or individual audit form. Make a copy of the form and change it so it matches the trash generated by your school lunches. You may choose to start small with class snack time, to track only one or two items, or to group the items by type (e.g.,paper, plastic, metal, food) or color code the items to make data analysis easier with young students. Please copy and change the data form to meet the needs and abilities of your students. The process of recording trash should not become a barrier to your students learning about trash and marine debris.

Lesson Steps:

Invitation

1. Revisit the BIG idea - How can we reduce marine debris?
2. Brainstorm as a class or in small groups "Does trash from our school look different from your home? Why?" Have them write their responses in their journals.

Exploration: Where is trash produced in our schools?

3. Where is trash produced in our schools?
    a. Brainstorm with students the sources of trash produced in their schools. Help them think about locations and types. You are leading them to the idea that school lunches are a big source of trash in a school.

b. Does your school have a waste management strategy?
    i. What is the waste management strategy at your school?
    ii. Investigate: Obtain or draw a map of your school
        1. Explore your school. Mark where trash cans, recycling and dumpsters are located.
        2. Explore how much trash is generated weekly/monthly (number of cans, volume of trash).
        3. Explore how often trash and recycling are picked up.

Concept Invention: Lunchroom Waste Audit

4. Lunch Audit Prep
    a. Select either the class or individual audit form - make a copy of the form and make any edits to it that might be associated with your specific school lunches.
    b. Determine the number of times and which meal data will be collected.
    c. Determine if you can measure the trash recorded in other ways than tallying (weight, volume, number of cans of trash, etc.).
    d. Remind students: They have an opportunity to research their school lunch trash, so that they can find ways to reduce the amount of trash being produced.
    e. Brainstorm with students the types of items that are thrown away during lunch. Working together, make modifications as needed to include the items thrown away in your school lunches.
    f. Ask students to make a prediction about the most prevalent trash item
5. Lunch Audit
    a. Use the Lunchroom Audit form and record the trash produced from school cafeterias, preferably over multiple days for the meal(s) that you are researching. These could include breakfast, lunch and/or snacks.
        i. Lunchroom audit student monitors can stand by trash bins and record items as they are thrown away.
        ii. OR provide a clipboard with the audit form and ask students to add tally marks to the chart as they throw their items away.
        iii. OR as a last resort, sort the trash after it has been thrown away (prepare for mess!).
    b. Compile and evaluate the data collected. Make a copy of this Google Sheet or use your own. You may want to elaborate on categories (example: food waste could include liquid and solid categories)
    c. Explore the math associated with the data:
        i. Averages
        ii. Percentages
        iii. Mean/median/mode
        iv. Fractions - parts of a whole
        v. Graphical representation

d. Here is an example of what a 4th grade teacher did with their data. By grouping the waste into categories the data analysis (math) was within the 4th grade educational performance expectations.

Application: Data Analysis

6. What do you think our data tells us?: Brainstorm with students a list of statements they think their data supports using Claim-Evidence-Reasoning. Do NOT evaluate their statements at this time. *The goal with this activity is to provide students time to think about their raw data.
    a. Number and record each statement as it is shared.
    b. Pair students and assign students to do a persuasive argument without talking using these directions/worksheet. The statement at the top can be modified to whatever you would like them to debate. Make sure students are viewing the data as they "discuss" their statement.
    c. Allow students time to revisit their "discussion" Golden Line statements.
    d. Revisit the list of statements as a class and annotate the statements that are connected to the data collected.
    e. If time allows: discuss what was missing for the statements that were not connected to the data.
    f. Ask students if there are other statements that can be made based on the date and make connections back to their predictions.
7. Explore: what items are re-used in the cafeteria that help reduce the amount of waste produced?
    a. Interview with school lunchroom supplies management.
    b. Identify: Who is the supplier for your school's food and lunchroom supplies?

Reflection

8. Ask students to record in their journals:
    a. One difference they noticed between the trash produced in their home compared to their school.
    b. One item of school lunchroom trash they think could be reduced.

💧 Great Lakes Literacy Principles Connections:

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