Waste Disposal Activity

Objective
Students will be able to conduct a trash audit to understand the types of items being thrown away in your area and determine ways to create less waste.

Introduction
Most marine debris starts as trash that is either littered or improperly disposed of (a knocked over or uncovered bin, flying out of a garbage truck, blown away from landfills, etc.) that makes its way into storm drains and is carried to the ocean. Therefore, the best way to prevent trash from getting into our environment is to not create it in the first place. Understanding the common items you use and throw away every day will help you to create less waste. Additionally, some items can be captured as a resource rather than waste to throw away. Knowing what items can be recycled in your area and practicing proper disposal of these items can also help you limit your waste.

Next Generation Science Standards
Science and Engineering Practices
- Planning and carrying out investigations
- Obtaining, evaluating, and communicating information

Crosscutting Concepts
- Structure and function
- Patterns

Disciplinary Core Ideas
- ESS3.C: Human impacts on earth systems
- ETS2.B: Influence of science, engineering and technology on society and the natural world

Supplies
- Gloves
- 5-gallon buckets or bags for sorting
    - Landfill
    - Recyclables
    - Compost/Green waste (if applicable)
- Tarp (to sort waste on)
- Scale
- Waste sorting poster (optional)

Procedure
1. Intro. Ask students what happens to trash when it is thrown away. Where does it go? What else can happen (e.g., landfilled, recycled, become marine debris)? Explain to students that the first task of the waste audit will be to understand how many items are thrown away incorrectly (trash items in the recycling or compost, recyclables in the trash or compost, compostables in

the trash or recycling). Then they will sort all waste into correct categories to understand their total waste creation and potential to divert waste by recycling and composting*.
**If composting is unavailable in your area, you can conduct this activity with just landfill trash and recyclables.*

2. Set up. Look up what is recyclable or compostable in your area on your city or county website. Go over with students what types of items get landfilled, what gets recycled, and what can be composted. Print out or make a poster for an easy reminder during sorting. It may be helpful to have a discussion with students about why certain items can be recycled or composted and why others can't, including film plastics (which are recyclable in some places but not others), bioplastics or compostable plastics (some of which are compostable in some facilities and others are not compostable or recyclable at all), and other items specific to your community's context. You can also discuss *why* these discrepancies exist and why some communities might lack access to these solutions.

3. Initial Weights. Ensure that all students who will be participating are wearing gloves, then remove bags from trash and recycling bins in your area (classroom, school campus, park, etc.). Measure the total weight and estimate the volume (based on size of the bag) of all the waste in each bag. Record in Worksheet 1 (**Appendix A**).

3. Misplaced items. Keep trash, recycling, and compost separate. Sort through each bin of waste and separate the misplaced items – trash items in the recycling or compost, recyclables in the trash or compost, compostables in the trash or recycling. Tally each misplaced item and record in Worksheet 2 (**Appendix B**).

- Find the volume and weight of the misplaced items
- List the items most commonly misplaced. What items do you tend to consistently find in the wrong bin?

Tip: While digging through trash can be gross, explain to students that it's important to have an honest perspective of what goes to the landfill. What makes trash yucky? Usually rotting food waste. But if we reduce our food waste or properly compost our unwanted food, then trash wouldn't be so gross!

4. Sorting! Next, have students sort through all the trash and separate items into the correct categories.

- *If you are eager to create sub-categories within these three main categories to gain a better understanding of what types of waste you have, refer to these additional label ideas:*
    a. *Recyclables - (Check with your waste hauler or municipal services to confirm what materials, including plastics by resin code, are recyclable in your area.) Plastics, Glass, Cardboard/Paper, Metal*
    b. *Landfill - Confirm what types of plastic or other materials are not recyclable in your area using your research. Non-recyclable Plastics , Other waste*

   c. *Compostables - Food waste, Green waste (grass clippings, leaves)*
- Calculate the weight and volume of each category and record in Worksheet 3 (**Appendix C**).
- Properly dispose of the waste by placing appropriate items in the green waste bin/garden compost system, recycling bin, or bin for the landfill.

5. Discussion. Discuss with students the results of the waste audit.
- How many pounds of waste did you sort? What category had the most material?
- Compare the initial waste weights before the audit and after sorting everything correctly. How accurate was your area in throwing things away correctly?
- This was a snapshot of one day. Can we calculate how much waste is created and misplaced over one week in this area? One month? A year?
- What were the most commonly misplaced items? Discuss why you may be seeing these trends (e.g. people may not know what is recyclable or not in their area, items are dirty, etc.)
- How can we keep waste from ending up in the wrong bins?
- Were any of the materials you found in the trash reusable?
- How does knowing this information help us make different choices?
- How can we reduce the amount of waste we're creating in general?

6. Assessment.
- Create charts, graphs, or infographics using your audit data.
- Use the data or figures from your audit to create a "Trash Report" for your class and present it to school or community decision-makers.

7. Extensions.
- Use the weights, volumes, or other measurements to practice math and other concepts including conversion, density, etc.
- Using the results of the waste audit, work together as a class to identify infrastructural or behavioral changes that could reduce your classroom waste.
- Repeat the audit at various time intervals (monthly, quarterly, etc.). Time series of your audit data can also be used for graphing and math lessons!

References
- One Cool Earth, Earth Genius Lesson 1: Waste Audit
- Falmouth Water Stewards and Sea Education Association, Trash Shouldn't Splash (pg. 55-57)

Appendices
- **Appendix A: Trash Audit Worksheet 1: Initial Totals (Before Sorting)**
- **Appendix B: Trash Audit Worksheet 2: Misplaced Items**
- **Appendix C: Trash Audit Worksheet 3: Final Totals (After Sorting)**

Initial Totals (Before Sorting)

Item	Total Weight	Total Volume
Landfill Trash		
Recycling		
Compost		

Trash Can Audit: Worksheet 2

Misplaced Items

Item	Tally of Items Misplaced	Total Weight (kg)	Total Volume (L)	Note commonly misplaced Items
Landfill Trash				
Recyclables in Trash				
Compostables in Trash				
Recycling				
Landfill Trash in Recycling				
Compostables in Recycling				
Compost				
Landfill trash in Compost				
Recycling in Compost				

Trash Can Audit: Worksheet 3

Final Totals (After Sorting)

Item	Sub-category	Total Weight	Total Volume
Landfill Trash			
	Non-recyclable Plastics		
	Reusables		
	Other		
Recycling			
	Plastic		
	Glass		
	Paper/ Cardboard		
Compost			
	Food Waste		
	Green Waste		