A Trash Data Activity

Objectives

Students will be able to understand where, how much, and what kinds of debris are present in their environment using the Urban Trash Monitoring Protocol, and brainstorm how this information can translate into local solutions.

Introduction

Solutions to coastal trash pollution lie, in part, in a better understanding of the types, amounts, distributions, and sources of trash items that travel from consumers, to city streets, and into waterways. Use the Urban Trash Monitoring Protocol to guide students through local trash monitoring.

Next Generation Science Standards

Science and Engineering Practices

- Planning and carrying out investigations
- Asking questions and defining problems
- Obtaining, evaluating, and communicating information

Crosscutting Concepts

- Scale, proportion, and quantity
- 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

- Supply list can be found in the Urban Trash Monitoring Protocol

Procedure

1. Intro. If you haven't already discussed the definition of marine debris, street litter, and their associated social and environmental impacts, please be sure to go over these concepts with students before beginning this activity. You also may want to revisit what a watershed is and how trash moves from people to streets to storm drains and then to the nearest water body and ultimately the ocean. Explain to students how understanding where, how much, what kinds of debris are present, and how the debris load is changing over time, is essential to developing new and effective source reduction strategies. We need to gather this data in a

standardized way to ensure our results are meaningful. The Urban Trash Monitoring Protocol is a tool that allows us to do this.

2. Set up. You will be conducting a neighborhood cleanup with the goal of answering a research question following the Urban Trash Monitoring Protocol. In this guide you will find the following:

- How to define your research questions or objectives for data collection.
- How to select your survey site.
- Supply list and how to prepare for your survey.
- How to conduct your quantitative assessment based on your objectives and capacity.
    - Tier 1: Measure the total weight and volume of all trash collected.
    - Tier 2: Sort trash into broad categories (metal, plastic, glass, paper, etc.) and take the total weight and volume of each category.
    - Tier 3: Sort plastics into finer categories since this material type usually dominates the results.
    - Tier 4: Categorize debris items even further by brand (or other metrics of interest to your group for example, plastic types).
- How to conduct a web-based assessment of your site.
- How to enter your data into Excel and conduct your data visualization and analysis.

3. Discussion

- Reflect on your original research question.
- What type of debris was most commonly found?
- Based on your results, what are ways you can prevent litter from making its way to the street?

5. Assessment.

- Have students write a lab report about their research question and utilizing the Urban Trash Monitoring Protocol.
- Create infographics using the data collected in the surveys.

6. Extension.

- Use community science tools, like the Debris Tracker App, to contribute your data to a broader community effort.
- Return to your survey site multiple times or in different conditions to analyze potential changes (and then create graphs and other visualizations to show those changes).
- Use the data collected in your surveys to create public service announcements or other outreach campaigns to prevent litter in the community.


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