



Building Water Stewards

NC
Standard
ESS.8.3.2

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Activity Description & Estimated Class Time

Over the course of two 50-minute class periods, students explore the pollution around their school, how they impact and are impacted by other areas in their local river basin, and develop an action plan to tackle their school's pollution problem. Students will participate in the international citizen science project Marine Debris Tracker, where their data will be used by scientists across their globe.

Correlations to NC Science Standards

ESS.8.3.2 Engage in argument from evidence to explain that the good health of humans and the environment requires: monitoring of the hydrosphere, water quality standards, methods of water treatment, maintaining safe water quality, and stewardship.

Learning Target

Students will demonstrate knowledge and understanding of monitoring the interactions of humans and the hydrosphere to become a good water steward.

Brief Science Background

Since 1950, researchers have estimated that more than 8.3 billion tons of plastic has been produced. 50% percent of the plastic used around the world is used only once and then is discarded. About 79% of all plastic has ended up in either landfills or the natural environment. Land pollution can get washed into rivers and end up in the ocean. Human-made pollution is one of the largest threats to the health of the ocean. Scientists estimate that 8 million metric tons of plastic enter our oceans each year. It can harm or kill wildlife through ingestion or entanglement, damage habitats, and threaten human health.

Dr. Jenna Jambeck, a scientist from the University of Georgia, created the project Marine Debris Tracker which allows for people to contribute data to real scientific research. By simply collecting pollution data and submitting it through an app, people are able to help further scientific research to help make a difference in their local and global communities.

Part 1 — Intro to Marine Debris Tracker

Materials

Materials for the whole class

- ability to play YouTube Video

Materials for the groups of four students

- 4 *Marine Debris Tracker* student activity sheet (SD 1)

Procedure

1. Introduce Dr. Jenna Jambeck by saying “Dr. Jenna Jambeck is a scientist from the University of Georgia. She is studying plastic pollution using an app called Marine Debris Tracker, and she needs your help! We are going to help by tracking the litter around our school grounds. This data can aid scientists in understanding the most common litter, where it is found, and help make critical decisions. We are going to learn a little more about Dr. Jambeck through a video.”

**Procedure cont**

2. Play the *What is Debris Tracker?* [YouTube video](https://www.youtube.com/watch?v=IhGvFLLp6dA) (<https://www.youtube.com/watch?v=IhGvFLLp6dA>). Ask students "What inspired Dr. Jambeck's study? Why is the Marine Debris Tracker important? Can someone summarize what will happen with the information we collect today?"
3. Give each student a *Marine Debris Tracker* student activity sheet (SD 1). Ask students to take a look on and around them. Have them list all of the things that are plastic and what they are using or would them for. After the list is complete ask, "How often do you use the items on your list? and What do you think happens to these items when they are thrown away?"

This is a great time to introduce some facts such as: 50 percent of the plastic used around the world is used only once and then is discarded. These plastics can get washed into rivers and end up in the ocean. Scientists estimate that 8 million metric tons of plastic enter our oceans each year.

Part 2 — Plastic Around Your School - Collecting Data

Materials**Materials for the whole class**

- gloves
- *Marine Debris Tracker* collection sheet (SD 2) if not using cellphones or tablets.
- trashbags or containers to collect trash (provided by teacher)

Materials for the groups of four students

- 4 gloves - 1 for each student
- 4 *Marine Debris Tracker* student activity sheet (SD 1) from previous part
- 1 *Marine Debris Tracker* collection sheet (SD 2) if not using cellphones or tablets
- 1 cellphone or tablet (optional)
- 1 trashbag or container to collect trash (provided by teacher)

Preparation

1. If your students are using cellphones or tablets to collect data in the field please follow these steps to set up their Marine Debris Tracker accounts. By using a cellphone or tablet a digital map will be created as they walk and collect data. **Each group will only use one cellphone or tablet when tracking data on the school ground. However, many students like to track on their own so it is important that everyone knows how to use the app.**
 - a. Download the Marine Debris Tracker app on their phone.
 - b. Use their school email and create a username using the following method:
 - i. Use their first initial, last name, and initials of your school Example: Rachael Polmanteer at River Bend Middle School Username: RPolmanteerRBMS
 - ii. Your password is your student ID. You will enter this twice.
 - c. Once the account has been created they can click quick track when they are ready to collect data at their school.
 - d. Review "Getting Started with Debris Tracker" at debristracker.org/resources.
2. If your students are not using cellphones or tablets give each group a *Marine Debris Tracker* collection sheet (SD 2). Their data will need to be uploaded manually on a computer.

Procedure

1. Have students predict on their student activity sheet (SD 1) what type of pollution they will find on their school grounds.
2. Give each group of students their materials. Discuss with students proper safety pro-



Procedure cont.

- cedures, and review how to collect data. No item should go into their trashbag or bucket until it has been documented either virtually or manually.
- 3. Take students outside to collect pollution data. If students are collecting manually, have students open up their app and select quick track.
- 4. After collecting data, students should return to the classroom, properly dispose of the trash, and wash their hands.

Part 3 — Plastic Around Your School - Analyzing Data

Materials

Materials for the whole class

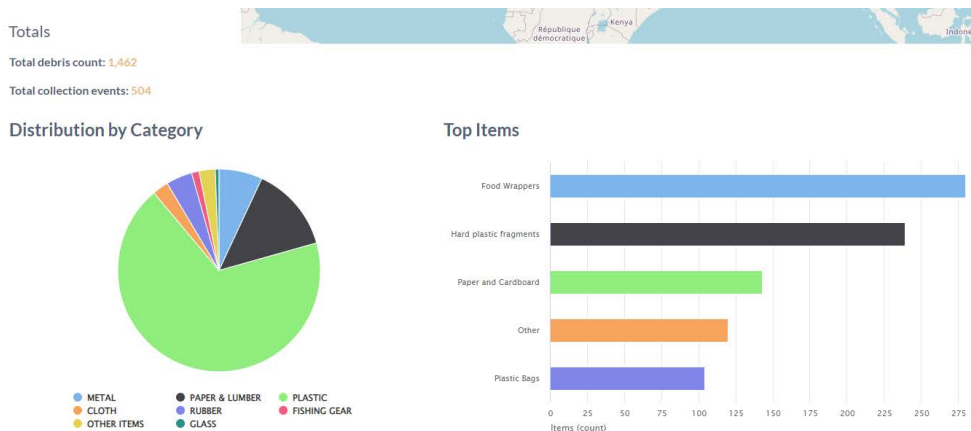
- Marine Debris Tracker collection sheet (SD 2) if not using cellphones or tablets.
- computer with access to internet

Materials for the groups of four students

- 4 Marine Debris Tracker student activity sheet (SD 1) from previous part
- 1 Marine Debris Tracker collection sheet (SD 2) if not using cellphones or tablets
- 1 computer

Procedure

1. Give each group a computer and have them go to www.debristracker.org. The person who used their account will login. If you entered the information manually have students login with you information.
2. As a class click on data. On the left hand side click my data, select the date you collected data, then hit search. Two graphs will appear that analyzes the data. If you manually entered data, click show manual events.



3. Ask students to complete questions 2-3. Discuss their results as a class.

Content Connection

1. Have students research what river basin they are in and where they are located in their river basin. Ask students "If it were to rain where would our litter go? What other locations(s) pollution could impact us? How do you think your local water community is being impacted by the items you found?"
If the school is located at the top of the river basin the pollution will flow downstream into other communities. If they are at the bottom of the river basin the pollution will with continue to flow downstream into a new river basin or into the ocean.
2. Based on the information gathered, have groups design an action plan to tackle the pollution problem at their school. If possible have the students implement their action plan.

SD 1 Marine Debris Tracker Student Activity Sheet

Name:

1. Take a look on and around you. List all of the things that are plastic and what you are using them for.

2. How often do you use the items on your list?

3. What do you think happens to these items when they are thrown away?

Plastic Around Your School

1. Predict what type of pollution you might find on your school grounds.

2. After collecting data:
What were the top items collected?

What were the categories of items collected?

3. Compare your results to your prediction. What surprised you?

SD 2

Marine Debris Tracker Collection Sheet

Place a tally mark (I) for each item found in the category below:

Total

	Plastic Bag		
	Plastic Bottle		
	Other Plastic Jugs		
	Plastic or Foam Pieces		
	Plastic Utensil		
	Straws		
	Aluminum or Tin Can		
	Plastic Food Wrapper		
	Cigarette		
	Foam or Plastic Cups/Plates		
	Plastic Caps or Lids		
	Paper		
	Other		

How many total pieces did you have? _____