

## Litter in the Niagara River Watershed: Data Collection, Analysis, and Interpretation

*Adapted from the "Litter in the Tennessee" by the Cumberland River Compact.*

Overview: We all know litter is bad, but how much litter is in our environment? Where does it come from? This lesson allows students to collect, analyze, and interpret data on litter in the Niagara River Watershed.

### TEACHER INFO

#### Standards:

- 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-ESS3-4 - Earth and Human Activity - Evaluate or refine a technological solution that reduces impacts of human activities on natural systems

#### Background information:

Trash on land, on roads or in parking lots can eventually make its way to our waterways when it rains. Litter flows from small streams and eventually flows into major waterways like Lake Erie or the Niagara River, which is a drinking source for millions of people. Individuals taking action to collect litter in different spaces can help our local waterways.

In this activity, students explore litter pollution through data graphing, analysis, and interpretation. Students collect their own litter and compare that data to previously collected data from a larger cleanup event.

Students will submit a graph and narrative interpretation of the data. This can be used to assess their understanding.

#### Materials:

- A piece of litter or photo of litter
- Video : <https://www.youtube.com/watch?v=lrRsQi9jQ38>

#### Discussion Topics:

Show the students a piece of litter you found or the photo of litter. Ask them what words come to mind when they see it. Tell students you are not sure where this litter came from, but you found it near a local stream or river. Have students brainstorm ideas about how that piece of litter got there. All of the brainstorm ideas should be connected to humans. Have the students seen this type of litter anywhere else?

Watch the video. This will help students understand how litter can end up in our waterways through storm drains.

Explain the activity to the students. They will collect their own data through a clean up and also compare their data to cleanup data from a Buffalo Niagara Waterkeeper cleanup event.

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### STUDENT GUIDE

#### Objectives:

- Collect data on litter in your community through a Solo Sweep
- Analyze and graph litter data
- Interpret your data to understand how litter may impact waters in the Niagara River Watershed
- Compare your data to cleanup data from a Buffalo Niagara Waterkeeper cleanup event.

#### Materials:

- Pencil
- Graph paper
- Gloves (for litter cleanup)
- Trash bag (for litter cleanup)

#### Background:

We have all seen litter or trash on the ground. Think of places where this is a common sight. This litter can have negative impacts on the environment. During rain events, litter can also wash from the land into waterways directly, or through storm drains.

You can make a difference by cleaning up litter in your neighborhood, around your school, or other places you recreate. In these activities you will participate in a littler cleanup and share the results using a graph. You will also compare your data to data from a Buffalo Niagara Waterkeeper cleanup event. After you analyze the data, you will create an interpretation, or explanation, of how the litter ended up on the group and what it's impact would have been if it entered a local waterway.

**\*Safety Note\*** Wear gloves when picking up litter. Do not enter busy roadways to pickup litter. Stay on public property.

Before moving on to the lesson activity, please watch this video:

<https://www.youtube.com/watch?v=lrRsQi9jQ38>

#### **Activity:**

Litter Pickup/Solo Sweep

1. Review Safety Guidance: <https://bnwaterkeeper.org/wp-content/uploads/2020/04/Cleanup-Safety-Infographic.png>

2. Complete a litter pickup around your home, school or somewhere else in your local community. Spend at least 20 minutes picking up litter. Complete the Data Sheet on the following page. (20 points).
3. Graph your results on the graph paper provided. Create a bar graph with how many items you found. (10 points) Litter type and number of items should be used on the x and y axis. Which one goes where? Be sure to label your axes. (2 points)

**Litter Collection Data Sheet:**

Count how many of each item you find to make a graph.

- \_\_\_\_\_ Plastic Bag
- \_\_\_\_\_ Drink Can
- \_\_\_\_\_ Plastic Bottle
- \_\_\_\_\_ Glass Bottle
- \_\_\_\_\_ Snack Wrapper
- \_\_\_\_\_ Plastic Fork, Knife, or Spoon
- \_\_\_\_\_ Fast Food Wrapper or Bag
- \_\_\_\_\_ Cigarette Butt or Cigar Plastic Tip
- \_\_\_\_\_ Plastic Straw
- \_\_\_\_\_ Styrofoam Piece
- \_\_\_\_\_ Small Plastic Piece

*If you find something not listed above, create your own category below.*

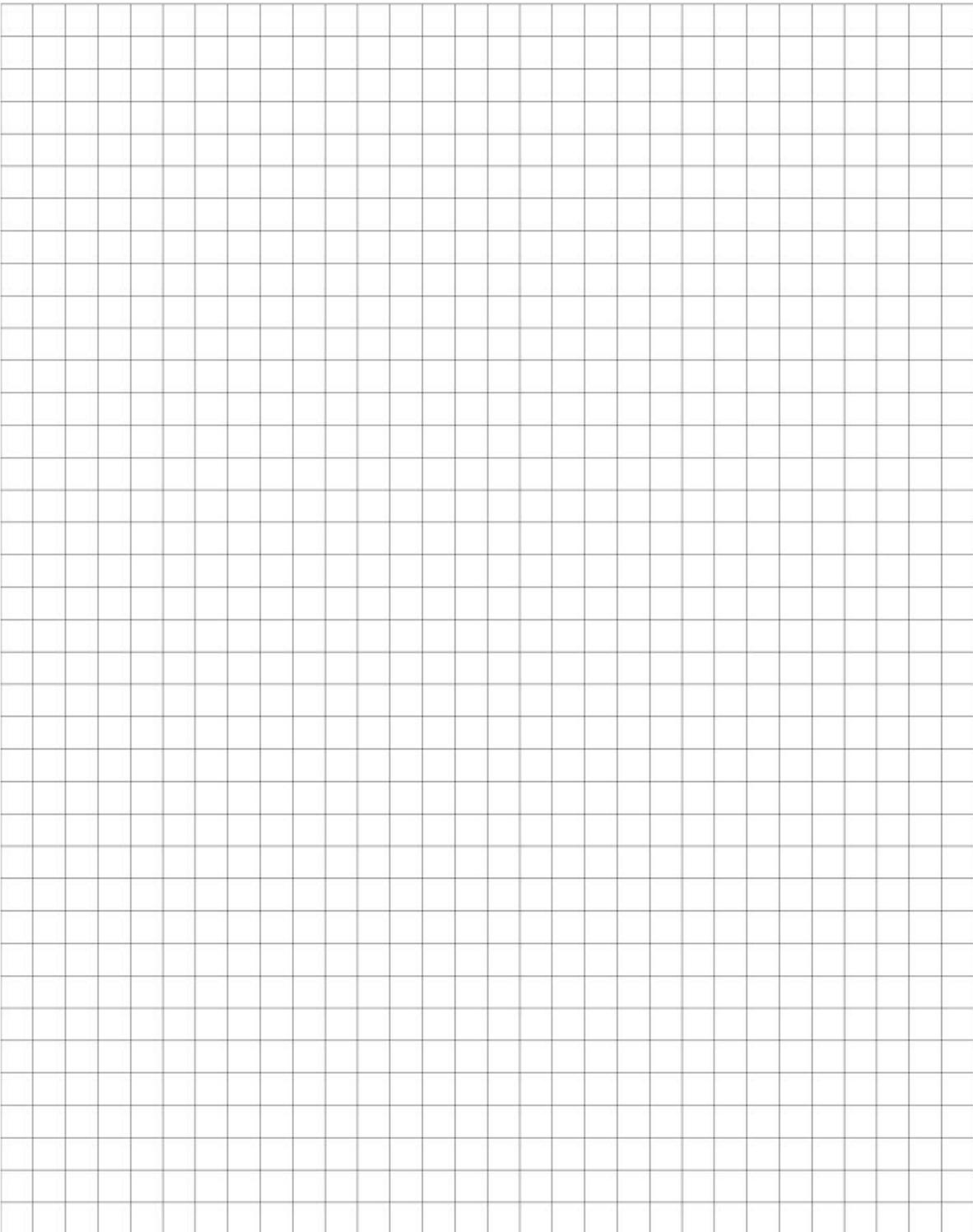
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

What was the strangest item you found? \_\_\_\_\_

What area did you clean up? \_\_\_\_\_

Were you surprised by what you found? Why or why not?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_







6. Read the following excerpt from a Greenpeace Article (<https://www.greenpeace.org/international/story/21792/plastic-waste-environmental-justice/>)

**Corporations Profit from Plastics**

*Corporations like Nestlé (world's largest food & beverage company) and Unilever (British multinational consumer goods company) profit wildly from single-use plastic packaging, while peddling the myth of recycling as a solution. But anyone who has thought seriously about the issue can see that recycling could never handle the amount of plastic surrounding our everyday life.*

*Also, don't forget that plastic is itself created from fossil fuels and lobbied for by the fossil fuel industry, while they desperately try to maintain the single-use plastic status quo instead of tackling the problem at source. Only by stopping the production of single-use plastics can this crisis be addressed. But these companies try to keep you in the dark by claiming recycling can solve the plastic pollution crisis to ensure their profit at the expense of people right now, today.*

Answer the following questions:

Who will ultimately pay for the damaging effects of plastic production? Do your parents and school pay for the cost of hauling their trash to the dump? Who do you think pays to maintain the dump in perpetuity? (10 points)

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