LESSON 3.2
PLASTIC POLLUTION IN OUR WATER

GRADE LEVEL	TIME
3-5, 6-8	60-90 MINUTES

ATWfhW

In this activity, students will learn about the fundamentals of water treatment systems and the challenges that microplastic particles present to both waste and drinking water systems. By testing filters of different sizes with plastic particles of different shapes and sizes, the students will observe how the sizes of materials influence each other.

Instructions:

1. Have students watch the video Here's Where New York City's Sewage Really Goes and discuss as a class the step in the wastewater treatment process that removes large items from wastewater.
2. Show students the different items and filters that will be used in the demonstrations.
    a. Have students make observations about the different sizes and shapes of the items and the different types of filters.
    b. Ask each student to write down their predictions about which items will pass through which filters on the Plastic Pollution in Our Water Prediction Chart.
3. Test out different types of filters to capture different sizes of plastic.
    a. Set up different filters over buckets.
    b. Fill pitchers with water and different size plastic items.
    c. Pour the water filled with plastic items over each filter and have students observe what happens.
    d. Have each student record which items move through each filter on the Plastic Pollution in Our Water Results Chart.
4. As a class or individually, have students complete or discuss reflection questions.

Learning Standards:

SCI:

5-ESS3-1, MS-ESS3-3, HS-ESS3-4,
3-5-ETS1-1, MS-ETS1-3, HS-ETS1-3

GLLP: 6, 7, 8

Materials:

- Here's Where New York City's Sewage Really Goes

Solid items of different sizes*

- Items less than 1cm: sand, coffee grounds, sprinkles, rice, couscous, etc.
- Nurdles** and other small fragments from larger plastic items (ie: plastic bottle, caps, etc.) found during deanups or personal use (can cut these items into smaller pieces as needed)
- Small items: plastic craft beads, dry beans, gravel, etc.

Different gauge filters

- Various nets or mesh fabric
- Kitchen strainer
- Coffee filter

Water

Pitchers

Buckets

Prediction chart

Results chart

Reflection questions sheet

*While this lesson focuses on plastic pollution, the items used in this demonstration do not necessarily have to be plastic - they can represent how plastic pieces of different sizes and shapes would function. The list of materials include some examples of what can be used but feel free to incorporate a wide variety of materials.

**Nurdles are small pre-production plastic pellets that are often lost during the plastic production process. To learn more about nurdles, check out this NOAA Ocean Podcast Episode: The Nurdle Patrol or visit the Nurdle Patrol's website.

PLASTIC POLLUTION IN OUR WATER
PREDICTION CHART

Name: _____ *Class:* _____ *Date:* _____/_____/_____

Prediction: Will the filter capture the item? Why or Why not?

	Item #1 _____	Item #2 _____	Item #3 _____	Item #4 _____
Filter #1 _____				
Filter #2 _____				
Filter #3 _____				

Plastic Pollution and You

PLASTIC POLLUTION IN OUR WATER
RESULTS CHART

Name: _____ *Class:* _____ *Date:* _____/_____/_____

Results: Describe what happened with each item and filter.

	Item #1 _____	Item #2 _____	Item #3 _____	Item #4 _____
Filter #1 _____				
Filter #2 _____				
Filter #3 _____				

Plastic Pollution and You

PERSONAL PLASTIC USE SHEET
REFLECTION QUESTIONS

Name: _____ *Class:* _____ *Date:* _____/_____/_____

1. Explain the similarities and differences among the filters used, and identify the best characteristics of each filter.

2. What part of the wastewater treatment process could remove large plastic items? What about small plastic items?

3. What size filter would best remove plastic pollution from wastewater? What are the advantages and disadvantages of using this technology to filter water?