

Microplastics and the Ocean Unit

Andria Kroening¹

¹Affiliation not available

May 3, 2021

Before the Activity:

Introduction to Plastics

Objectives: Students will Have Students Watch a Plastic Ocean and complete a Video Worksheet.

Discuss Students thoughts and reactions to the video.

- Did they realize the effects of plastics?
- How do you feel after watching the film?
- Why is it not practical to just ban everything made of plastic?
- Do you think we have plastics in our local waterways?

Microplastic Sampling

Students are trained in Microplastics Sampling at the beginning of the school year. Students will sample local watershed using the Florida Microplastic Awareness Project Procedures to sample for Microplastics in local watersheds and collect data once a month. Students will identify which types of microplastics are present in local watersheds and which types are most abundant. (Students should find the microfibers from clothing and wash machines are typically the most common) Students will make a graph of the number of microplastics in a 1L sample Students will upload data into the Microplastics Awareness Project Database (citizen science project)

Lesson Activity Construct a Microplastics Filter

Objectives: Students will create/build a device to filter out or “catch” microplastics

Standards:

Evaluate or refine a technological solution that reduces impacts of human activities on natural systems. (High School)

Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants. (High School)

Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering (High School)

Materials:

- Microscopes
- Computers
- Access to graphing program(Excel/Google Sheets)

Materials for Filter Construction:

- Coffee filters
- Strainers/colanders of varying sizes
- Bath sponges/loofahs
- Mesh nets of various sizes
- Panty hose

Procedures

1. Students will work in teams of 3 to design a filter using the above list of materials to effectively filter out microplastics from a water sample.
2. Students will be able to test their design to make sure the filter holds up from passing tap water through the filter and make adjustments as the team sees fit to finish their design to be tested.
3. Teams will be given a sample of water from the watershed that was tested in the PreActivity to test their filters.
4. Students will then graph the number of microplastics in their 1L sample after using the filter they designed.
5. Students will compare their filtered data numbers with their non-filtered data (from Pre Activity) to make conclusions whether their design was effective at filtering out microplastics.

Follow up activities (Extensions)

Students will continue to monitor local watershed microplastic data once a month for the school year as part of the Microplastics Awareness Project and enter data for locations (citizen science project)