



MICROPLASTIC POLLUTION AND THE HEALTH OF OUR OCEANS

LEARNING GOALS

- To explore some of the causes and impacts of microplastic pollution in the ocean.
- To understand how Hawaii's location and affected ecosystems put us on the front lines of combating microplastic pollution.
- To practice drawing connections between local challenges and global contexts and best practices.

ASSIGNMENT

Estimated Time: ~25 min

- Read "[Why does the Arctic have more plastic than most places on Earth?](#)" (~7 min)
- Watch "[How Plastic from Clothing Gets Into Seafood](#)" (4:59)
- Listen to "[What Are the Long-Term Impacts of Microplastic Pollution in Hawaii?](#)" (11 min)
- Read "[Lawsuit: Feds Failing to Protect Hawaii Waters from Plastics](#)" (~3 min)

TERMINOLOGY

- **Microplastics** - very small pieces of plastic less than 5 mm in length that pollute the environment
- **Nanoplastics** - At the moment there does not appear to be scientific consensus on an exact definition of nanoplastics, but they are often referred to as microplastics that are smaller than 1 μm (micrometer, or 1000 nanometers) OR smaller than 100 nanometers. Due to their small size, nanoplastics can cross cellular membranes and affect the functioning of cells.
 - 1 meter = 10 decimeters, 100 centimeters, or 1000 millimeters
 - 1 millimeter = 1000 micrometers (μm)
 - 1 micrometer = 1000 nanometers (nm)
- **Biomagnification** - any concentration of a toxin, such as pesticides or plastics, in the tissues of tolerant organisms at successively higher levels in a food chain.

KAHOOT QUIZ

- Go to Kahoot.it or use the Kahoot mobile app and enter the pin 02068295
- Or, use [this link](#)



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DISCUSSION QUESTIONS

- What are some of the major sources of microplastics?
- How do microplastics affect the health of marine wildlife?
- How do microplastics affect human health?
- What contributed to the accumulation of so much plastic in Greenland's ice floes?
- How is the Arctic especially vulnerable to the effects of microplastics?
- Do you go to the beach often? Do you notice plastic and microplastic pollution?
- What are Hawaii's NGOs suing the EPA for and why?
- What is the Clean Water Act and how is it important in this lawsuit?
- What are some pros and cons of the lawsuit? Are there other solutions for reducing microplastic pollution in our oceans?

ADDITIONAL RESOURCES

- ["An 18-year-old Has Found A Way To Use 'Magnetic Liquid' Invented By NASA To Remove Harmful Microplastics From Water"](#)
Business Insider article about the Irish teen who won the 2019 Google Science Fair and his project.
- [The Big Interview: Professor Richard Thompson](#)
A multimedia interview with the researcher that coined the term 'microplastic'.
- ["Microplastics Found in Remote Region of France's Pyrenees"](#)
Microplastics are not only in the oceans. This Smithsonian Magazine article covers a study conducted recently in the Pyrenées, a mountain range that lies between France and Spain.
- ["How much plastic is your washing machine sending out to sea?"](#)
Vox Article: More information on the microplastics derived from clothing.
- Hawaii Public Radio: [Microplastics News Stream](#)
HPR has a microplastics tag you can use to learn about recent developments in microplastic research.

IDEAS FOR ACTION

Easier

- Be conscious in your shopping: avoid purchasing clothing made from synthetic fibers and beauty products with plastic microbeads that will be washed into the oceans.



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IDEAS FOR ACTION (continued)

Medium

- Volunteer: Join weekly beach cleanups with a local nonprofit like 808 Cleanups, the Surfrider Foundation, or Sustainable Coastlines Hawaii.
- Organize an event: Research local scientists who are working towards creating technology to help reduce microplastics in the ocean. Invite them to your school to discuss their projects.
 - Or, take inspiration from the Irish teen in the additional resources above! Ask the researchers how to get involved with sustainability research.
- Research the lawsuit NGOs are bringing against the EPA. How is it progressing? What challenges exist?
- Contact your representatives and let them know if plastic pollution matters to you and why.

Hard

- Policy advocacy: research bills in the city council and state legislature related to plastic pollution. Write and submit testimony.

HAWAII CORE STANDARDS FOR SOCIAL STUDIES (HCSSS) LINKS

- Content Standard [SS.WH.8.12.1](#)
- Content Standard [SS.US.12.8.1](#)
- Action Projects link to [SS.PID.5.7.1](#)
- Next Generation Science Standards:
 - [HS-LS2-7](#)
 - [HS-ESS3-6](#)

This lesson was created by Paige Lockwood.