



ACTIVITY

THE IMPACT OF PLASTIC POLLUTION ON THE ENVIRONMENT

Time: 120-180 minutes

Days of Implementation: 2-3 days

Grade Level: Lower and Upper Secondary

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Alignment with STEAM subjects

Science: Investigating the environmental impact of plastic waste, biodegradation, and the effects of microplastics on ecosystems.

Technology: Using coding tools to create interactive digital projects that raise awareness of plastic pollution.

Engineering: Using recycled materials; designing and prototyping a functional product.

Arts: Creating visually compelling awareness materials, upcycled products, or digital animations to communicate the importance of waste reduction.

Mathematics: Collecting and analyzing data from plastic waste audits; representing findings in graphs or charts to track plastic use; and proposing realistic reduction goals.

Related or achieved SDGs

- SDG 12: Responsible Consumption and Production: Creates awareness on the importance of being responsible consumers in order to protect nature.
- SDG 14: Life Below Water: Promotes exploration of marine ecosystems and showcases the need to reduce harmful plastics.
- SDG 15: Life on Land: Centers the importance of protecting both land and coastal ecosystems.

Objectives

By the end of the class, students will be able to:

- Understand the environmental impact of plastic waste.
- Apply engineering and design thinking to real-world sustainability issues.
- Develop problem-solving, teamwork, and innovation skills.
- Use coding, art, and storytelling to raise awareness of plastic pollution.
- Promote responsible consumption and waste reduction practices.

Materials Needed

- Computer and coding tools such as [Scratch](#), [Tynker](#)
- Recycled materials
- Artistic materials

Lesson Plan

Introduction

Plastic was first discovered in 1856 and has significantly influenced human life since then. Although plastic presents distinct benefits in the social, technological, and medical sectors, it also threatens ecosystems. Most plastics do not decompose completely; instead, they degrade into micro-particles that can damage the environment, particularly oceans and marine life. Students will explore the role of one of humanity's most urgent challenges, contemplate the complexity of societal issues, and discover the necessity for comprehensive solutions.

1. Inquiry & Exploration

Guide students in exploring the following projects about plastic waste and trash that are destroying coastal communities. They can also look up news stories about their local community and country.

- [Eating up easter](#)
- [Pormpuraaw and the Australian Museum](#)

Discussion Questions:

Ask the students:

- What is going on in these two places in the articles above?
- How are the communities dealing with that issue?
- Do you know of any other similar cases? Is this happening in your country or community?

2. Investigation & Research

- Have students do a deeper investigation of the impact of plastic waste on marine life, ecosystems, and human health. This is in preparation for students to conduct a mini plastic audit of their school or home, identifying familiar sources of plastic waste. Students can begin by selecting a specific geographical area that they can access. This could include the school compound, their backyard, their street, or another safe and accessible area. Provide students with guidelines to examine this area and identify commonly used plastic items and packing found in household items or waste.
- Students should carry out an audit to catalog the types, quantities, and possible alternatives to these items.
- The audit process consists of:
 - **Observation:** Walking around the area and identifying where plastics are most abundant.
 - **Data Collection:** Using simple checklists or logs to record various plastic products. Notes can also be recorded in STEAM Journals.
 - **Analysis:** Sharing discoveries with peers. Have a discussion on the forms of plastic that each student found during the observation and data collection period. During this discussion, encourage students to think critically and consider why certain plastics are used.
 - **Solution Building:** Brainstorming how households and individuals can reduce their plastic usage. Encourage the students to consider alternative materials or have them suggest creative methods to reduce plastic usage.

3. Implementation & Design

Based on the audit outputs, have students select one solution to implement. For example:

- Design and prototype a reusable alternative: To minimize waste, students can develop an eco-friendly alternative to single-use plastics, such as reusable lunch wraps or upcycled bags.
- Create a recycling system or awareness campaign: Students can develop a recycling system for their school or home, or launch an awareness campaign using posters, videos, or digital presentations to educate others on reducing plastic waste and adopting sustainable habits.
- Waste-sorting or recycling tool: Students can build a physical prototype of an invention that could sort or collect plastic waste.

4. Testing & Reflection

Provide an opportunity for students to test their solutions, depending on the direction they have chosen. This could include through a showcase or through a physical demonstration of their prototype. During the testing process, ask them:

Reflection Questions:

- What works well in your design?
- What doesn't work as well?
- What would you like to change before your final presentation?

5. Presentation & Action

Provide an opportunity for students to showcase their solutions to peers, parents, or the school community.

Discussion questions include:

- How does your project impact plastic waste reduction in your area?
- What insights did you gain about plastic waste and sustainable practices?
- What did you learn about innovative design versus practical application?
- How can your solution be improved to make a more significant impact?
- In what ways can you promote sustainability beyond this project?
- How did this project enhance your understanding of interdisciplinary approaches to environmental issues?

Criteria

- Quality and organization of data collected during the waste audit (checklists, logs, photos).
- Innovative design of a reusable alternative, recycling system, awareness campaign, or device.
- Practical viability and real-world implementation potential.
- Functionality and craftsmanship of the prototype, design, or materials.
- Effective use of recycled or sustainable materials.
- Presentation quality of the proposal, including concept, process, and potential impact.
- Communicating the project's relevance and motivating sustainability actions.

Reflection

- Did students fully understand?
- What should I improve for next time?
- Was the lesson interesting enough for the students?