Climate Wise Schools and Students
(2024-1-ES01-KA220-SCH-000251082)

Topic: Microplastics (Complied by Portuguese partner)

Level: Middle school

Time: 50+50 minutes

Objectives: Students will be able to;

- ✓ Understand what microplastics are, and their sources.
- ✓ Explore the environmental and health impacts of microplastics.
- ✓ Foster critical thinking and problem-solving skills through gamified activity.
- ✓ Explore microplastics reduction practices
- ✓ understand how to modify daily lifestyle for eco-friendly purposes

Disciplines: Natural Science, Technology, social sciences

Materials: Computer, tablet, projector, mobile phone

Activities and Practices: Using gamification to engage students in problem-solving related to microplastic pollution

Warm-Up Activities: Mission: Plastic cleanups – save the oceans

Introduction

The teacher presents students with a scenario:

"The ocean is in crisis! Microplastics have infiltrated marine ecosystems, threatening wildlife and the food chain. You have been recruited as environmental scientists to analyze the problem and develop solutions."

The teacher briefly explains:

- ✓ What microplastics are;
- ✓ How they form (e.g., breakdown of larger plastics, microbeads, synthetic fibers);
- ✓ Their effects on the environment, organisms, and humans.

Then students watch a video about the cycle of microplastics:

https://www.youtube.com/watch?v=fyYy58aTs7U
The students are asked if they knew about the problem presented and about their feelings after watching the video.

After the video, students do a quiz to assess their understanding and what they already know

https://create.kahoot.it/my-library/kahoots/4332e4fb-5cfe-4d06-bb83-c04815ff7d2d
(microplastics by Portugal)

Main activities:

To choose the team leaders, students complete the following task individually:
"Identify and record daily habits that use/consume a lot of plastics" within three minutes. Each correct answer gets 5 pts. The top four ranking students will be the leaders of the four groups.

A discussion with the students about how changing these habits can significantly contribute to microplastics reduction and environmental protection can be held.
By means of the wheel in the link, each leader gets a character for his/her team. Then the teams are formed (each student spins the wheel and the character in the wheel matches the leaders with their teams

https://wheelofnames.com/h49-vbn

Task 1: Students do interactive exercises about sources of microplastics:

“Which of these is a major source of microplastics?” https://wordwall.net/resource/89491020

Task 2: Students do an activity about the impact of microplastics on the environment and human life

https://wordwall.net/tr/resource/85184054

Task 3: Students do an activity about solutions to minimize/ reduce microplastics

https://wordwall.net/resource/85184824

Wrap-Up Game: The Microplastic Challenge (5 minutes)

Instructions: This is a quick quiz-style game where you can use either a classroom response system or a simple hand-raising method.

Ask multiple-choice or true/false questions based on the lesson content, like:

“True or False: Microplastics are harmful to marine life.”

https://wordwall.net/resource/89490634

Students with the best results get a certificate of “eco-guardian”

Debrief and Discussion

Teams share:

- ✓ What they learned about microplastics.
- ✓ Their solutions and ideas for reducing microplastics in daily life.

(e.g. Personal actions like reducing synthetic clothing use or supporting eco-friendly brands)

After all these activities students can watch a video:

“Turkish diver raises awareness to worldwide water pollution”

https://www.youtube.com/watch?v=cHvfamWIzIM

Assessment:

- ✓ Participation in the activities / tasks
- ✓ Creativity and feasibility of suggested solutions
- ✓ Teacher assesses the comprehension of students orally and asks them to assess their performance with a self-assessment form.

Assignment:

The students are assigned micro plastics reduction practices in daily school life, such as:

- ✓ using the recycling bins to dispose of plastic water bottles, juice and milk cartons, etc.;
- ✓ campaigning to use reusable bottles and other containers;
- ✓ students: are divided into groups and design informative posters about microplastics. They can display them around the school;
- ✓ track how much single-use plastic the school uses in one week and find ways to reduce it

Follow up activities (optional)

1.Citizen Science Projects: Students can participate in local water or beach sampling projects to collect and analyze microplastics. This not only introduces them to real scientific methods but also contributes to local environmental monitoring.

2) Art and Design Competitions: Encourage students to create artworks or design sustainable products using recycled materials. This could include a "Plastic Upcycling" contest where students turn waste plastics into functional objects or art, fostering creativity and sustainability.

3) Role-Playing Debates: Organize debates or mock council meetings where students assume roles (e.g., policymakers, industry representatives, environmental activists) to discuss and propose solutions for reducing microplastics. This helps them understand the complexities of environmental decision-making.
4)Documentary Screenings and Discussions: Host viewings of documentaries on plastic pollution and microplastics, followed by group discussions to reflect on the impact of plastic waste and brainstorm community actions.

5) Interactive Workshops: Invite local experts or NGOs (e.g., representatives from Common Seas or local environmental groups) to run workshops on how microplastics affect marine life and human health, and what practical steps can be taken to mitigate these impacts.

6) Field Trips: Visit recycling centers or polluted sites to observe the impact firsthand

References:

- https://www.aegean.gr/ • https://www.plasticfreegreece.gr/
- https://ec.europa.eu/environment/waste/plastic_waste.htm • https://www.medasset.org/
- https://greenliving.gr/2023/12/01/i-apeili-ton-mikroplastikon/

- https://greece.representation.ec.europa.eu/news/prostasia-toy-periballontos-kai-tis- geias-i-epitropi-thespizei-metra-gia-ton-periorismo-ton-2023-09-25_el Video:
- https://www.youtube.com/watch?v=sl82ZO9AT4Y • https://www.youtube.com/watch?v=1acjqraXMhs
- https://www.youtube.com/watch?v=NgjMd-VNEac • https://www.youtube.com/watch?v=Yomf5pBN8dY
- https://www.youtube.com/watch?v=qiXRTA0tYoI • https://www.youtube.com/watch?v=aiEBEGKQp
- https://multimedia.europarl.europa.eu/en/share/N01-PUB-181119-MPLAS? lang=en&controls=on
- https://aegeanrebreath.org/en/major-study-concerning-microplastics-on-greek- beaches-by-aegean-rebreath/
- https://www.miteco.gob.es/es/ceneam/recursos/pag-web/basuras-marinas-plasticos-microplasticos.html
- https://www.miteco.gob.es/es/costas/temas/proteccion-medio-marino/basuras-marinas/basura-programas.html
- https://www.youtube.com/watch?v=S9mnBwFsQ1Y https://www.youtube.com/watch?v=VPGeU4IXfBo
- https://www.youtube.com/watch?v=qFqNr-skd_4 https://www.youtube.com/watch?v=DJoOWXH27LU
- https://www.blueflag.global/new-blog/2024/3/20/plastic-free-shores-plastic-free-waters-increasing-awareness-on-plastic-pollution-among-beach-users-in-konyaalt-and-serik-public-beaches-antalya-turkiye
- https://mikroplastik.org/en/microplastic-research-group/?utm_source=chatgpt.com
- https://www.dailysabah.com/turkey/2019/08/20/schools-across-turkey-embrace-zero-waste-project
- https://www.croatiaweek.com/robot-boat-jadranko-croatia-microplastics-adriatic/