

BIOMAGNIFICATION GAME

GOALS

- Understand the food chain
- Stimulate students' awareness of their own use and disposal of plastics

WHERE

In the classroom, at the gym or outdoors

TIME

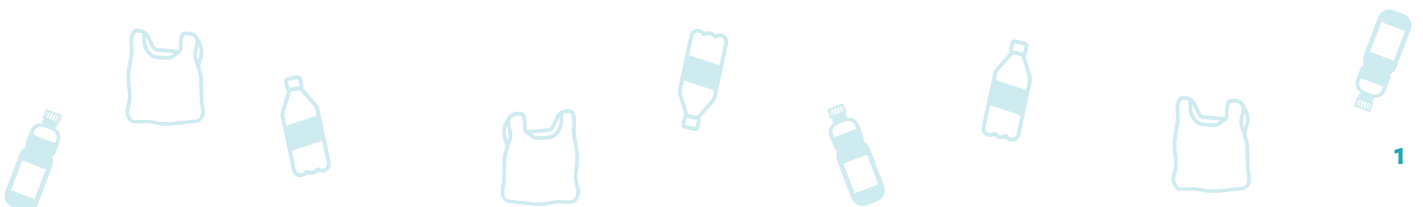
30 minutes

TOPIC

Concept of biomagnification in relation to plastic; to show how chemicals and plastics can reach our table

LEVEL OF PHYSICAL ACTIVITY

High (running)





BASE CONCEPT

Plastics, toxic chemicals and heavy metals enter the ocean as industrial, agricultural and human waste products. This waste often reaches the sea via rivers, where it is dumped. These pollutants can be very harmful, especially to animals at the top of the food chain (large predators), due to the biomagnification process. Biomagnification is the process by which the accumulation of toxic substances in living beings (bioaccumulation) increases in concentration as one ascends to the next trophic level, i.e. proceeding from bottom to top in the food pyramid, within the so-called trophic or food chain.



HOW DO YOU DO IT?

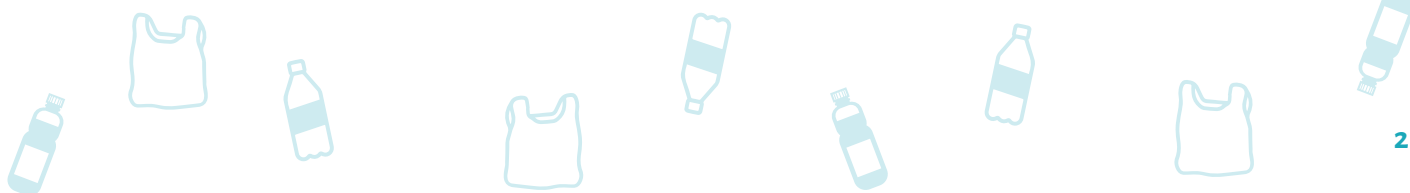
THIS ACTIVITY HAS A FUN ELEMENT INSPIRED BY THE FAMOUS GAME "TAG, YOU'RE IT".

Activity:

1. Choose 3/2 students, depending on class size, as fishermen
2. Choose 5/4 students to represent salmons
3. The rest of the class, which should be the majority, will be shrimp.
The pupils representing the shrimps must stand on one side of the room. The shrimps will be given a handful of plastic pieces, unevenly, so that some pupils will have only 1 piece of plastic while others will have even 5/4. (Important: salmon and fishermen must not know this step).
4. The game begins with the first round: salmon and shrimp will be arranged facing each other, ready to run. At the start, the salmon have to catch (eat) the shrimp. When a salmon catches a shrimp, they hook it arm in arm. Once all the shrimp have been caught and eaten, the second round can begin.
5. In the second round, the fishermen enter the game and have to catch as many salmon as possible (important: the shrimps must remain tied to the salmon that ate them during the first round).
6. After all the salmon/shrimps have been caught, all students sit down in groups: each fisherman with his salmon and associated shrimp. At this point the shrimp have to pass their bits of plastic to the salmon that caught them. Then, in the same way, the salmon passes the (now many) plastic bits to the fisherman. Each of the fishermen should have a significant amount of plastic in front of them.
7. At the end of the game each shrimp will have to declare aloud how many pieces of plastic it had "eaten" before being caught by the salmon.

Discussion:

1. What do these piles of plastic in front of each fisherman mean? How did it happen?
2. How did plastic reach fishermen? Why?
3. What are the implications for people who eat this salmon



4. Discuss the concept of biomagnification and, in the general framework, how important is the health and habitat of even the smallest element at the bottom of the food chain.
5. Try to think about the concept of plastic as a material that does not dissolve or disappear in the marine environment, but instead disintegrates into smaller and smaller pieces that end up suspended in the water and are also ingested by marine creatures.
6. Try to think if the phenomenon of biomagnification could also occur with other types of polluting materials.
7. Discuss about the fact that the same process happens when using chemicals, such as medicines, oils and other dangerous substances that are dumped into the ocean.
8. Discuss the sources of plastic pollution in water and methods to prevent and reduce plastic in the oceans.
9. Remember to recycle the plastic pieces used in the game.



WHAT DO I NEED?

For each student:



SMALL PIECES OF PLASTIC

(such as bottle caps or cutouts from a plastic water bottle or container, make sure the bits have no sharp edges). They must be small enough that students can hide them in their hand. At least 2 pieces of plastic will be needed per person for each group.



THE SPACE

It must have enough room for the group to run around and be free from obstacles and tripping hazards.



CREDITS

This game was made by “[Sailors for the sea organization](https://www.sailorsforthesea.org/)”, thanks to developers Laura Dunphy and Rachael Miller of the Rozalia Project for a Clean Ocean. To learn more about the project cleaning up the oceans and find useful information about marine resources and debris, visit the website www.rozaliaproject.org

REMEMBER THAT SHARING IS IMPORTANT

Take a picture to tell us about your experience in class and send us an email at: info@istituto-os.org. Share it on social media with the hashtags: **#LifeBeyondPlastic#PlasticLessSchool!**

Funded by



Implemented by



In partnership with

