



Activity Physical Geography

Geography - Module 1

In-Class Activity

45 minutes total time

Introduction to Solutions

Instructions:

1. Split the class into 4 groups:
 - a. 3 groups each presenting one solution to win a grant:
 - i. Bubble barrier
 - ii. Fleet floating barrier
 - iii. The inceptor
 - b. The fourth group will act as judges. They will point out the hurdles and complications of each solution.
 - c. They are part of a board of an environmental agency which is trying to decide on committing to/funding one solution so when they give their verdict they have to state why they chose the one they did and why they didn't choose the two others.
 - i. The Judges will receive information on all three solutions.
 - ii. Decide which idea they would invest in and then give reasons for their decision.

Get started!

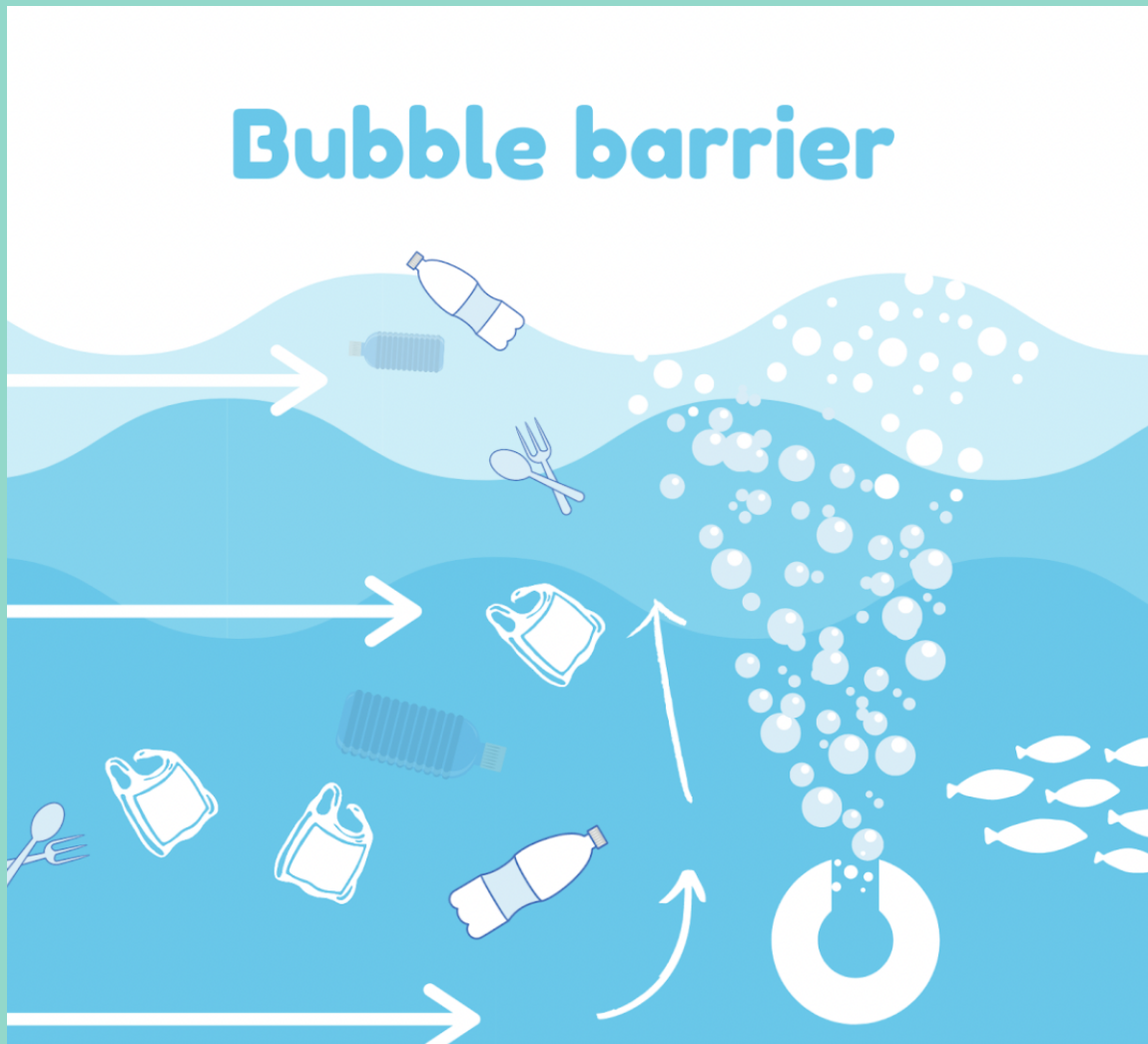
20 minutes

1. Divide the class into three groups and allocate each one solution, and one group as judges. Provide each group with the relevant information sheets.
2. Tell the three groups allocated a solution that they need to convince the government grant committee (the judges) to fund their project.
3. Hand out the project sheets which students can fill out in order to prepare with the positive and negative points of their allocated solutions.

Bubble Barrier

Catches plastic before it enters the ocean. It literally is a barrier out of bubbles that come from a tube, located on the ground of a river/canal. The tube pumps air through its holes and thus forms a barrier that brings plastic up to the surface. The natural currents then guard the trash to the side of the rivers/canals where a catchment collects the trash.

- Currently being [used in Amsterdam](#)! At Westerdok
- [Video](#) with explanation by [The Great Bubble Barrier](#)



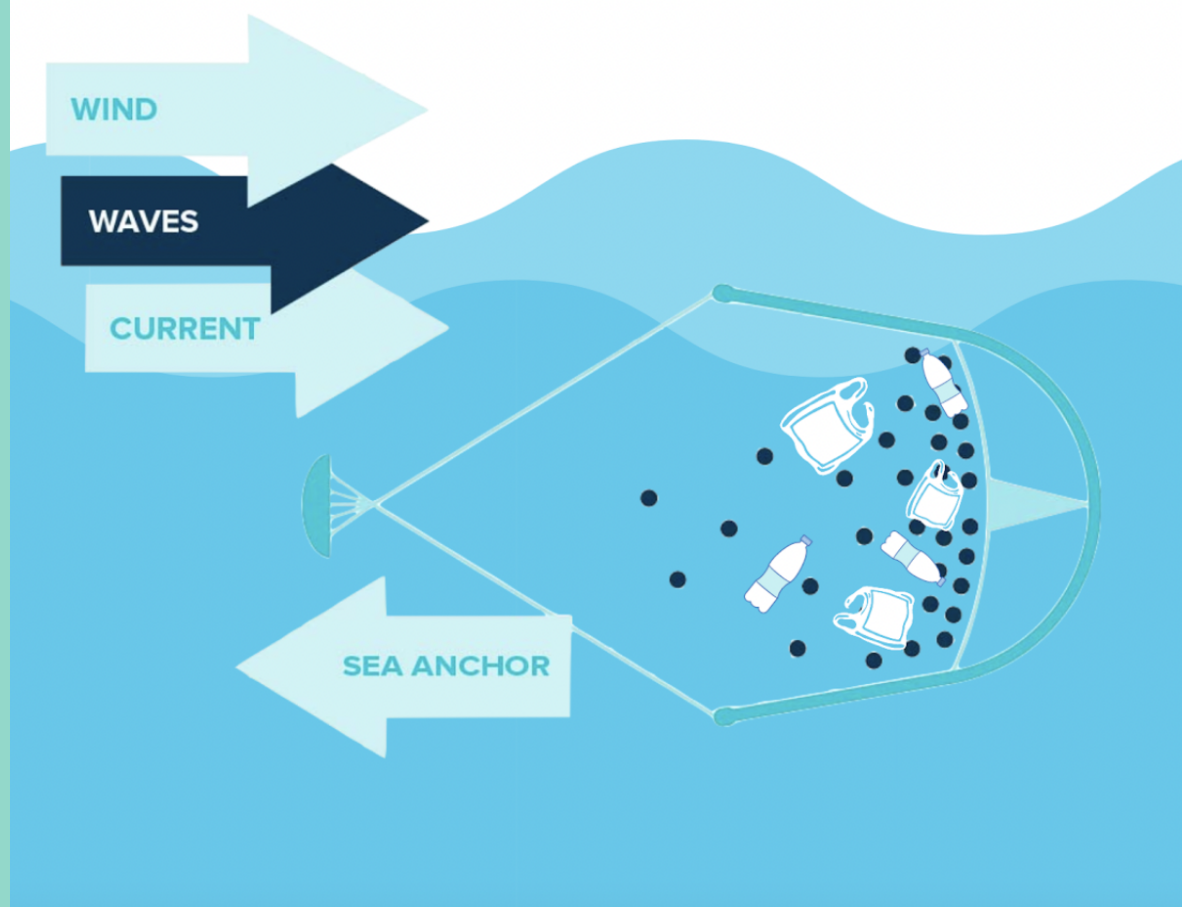
- + It does not hinder ship or fish
- + It is a sustainable method
- "The project is expensive to execute"
- "The bubble barrier does not work on plastics that are smaller than 1 mm"
- Does not really work for very deep rivers because the pressure needed for the bubbles would be too large and too expensive. In such a river, the interceptor might be the better solution.
- Stays at one individual location

Fleet floating barrier / System 001

Creates coastlines that catch plastic. 600-metre swimming barrier with a 3-metre deep net. It works with wind, waves and currents. Due to its buoyancy the wind forces the barrier to move faster than the plastic. The downward stream lets animals pass through. The net is deeper in the middle and thus is bend in by currents which can then catch plastic in its center.

- [Deployed in 2019](#) into the Great Pacific Garbage Patch
- [Video with explanation](#) by [The Ocean Cleanup](#)

Fleet Floating Barrier

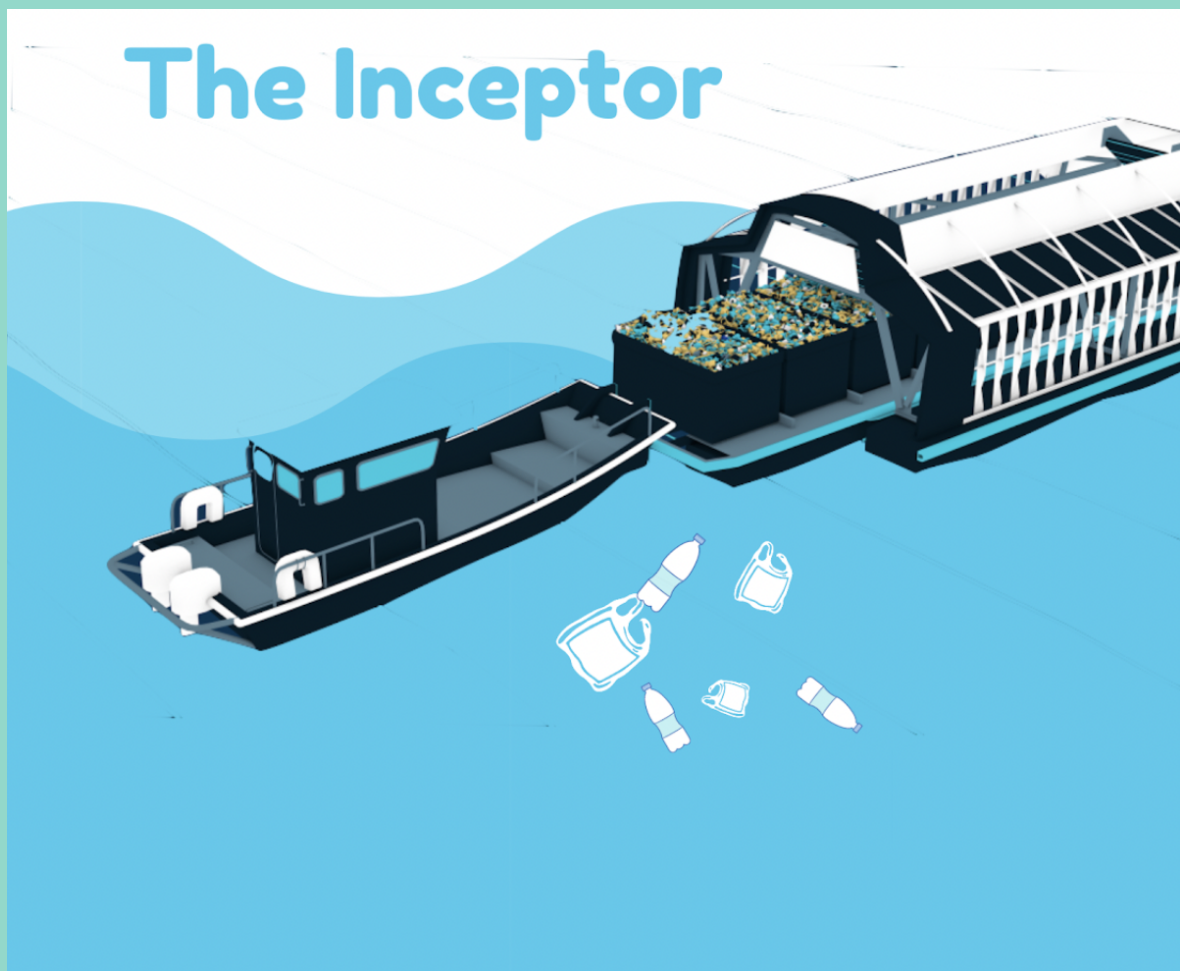


- + Can be [extended to any length](#) to fit with requirements of water area
- + Constantly moving
- Only catches superficial plastic debris, no trash that is deeper than 3 metres

The Interceptor

The interceptor collects waste through a conveyor belt on rivers and stores the surface plastic **in rivers** onto the inceptor. River waste flowing with the current is guided by the barrier towards the opening of the Interceptor. Thanks to the Interceptor's catamaran design, the water flow path is optimized to pass through the system, carrying the plastic onto the conveyor belt. The interceptor alerts the system when it's full, and the containers full of plastic debris are unloaded and emptied for recycling.

- [Currently deployed in](#) Jakarta, Malaysia, and the Dominican Republic
- [Video with explanation](#) by [The Ocean Cleanup](#)



- + [Prevents plastic](#) coming from rivers from entering the oceans
- + "At top performance, the interceptor can extract up to [100,000 kilograms of trash per day](#)"
- + Can be used anywhere
- + Energy neutral as it's solar powered
- A lot of analysis has to go into where to set it up, based on [many factors](#): "flow-velocity, the width of the river, presence of a plastic "hotline", traffic, proximity to a delta, etcetera"
- Expensive and difficult to set up
- Not widespread and still in the process of becoming a popular product

FOR PRESENTING SOLUTIONS GROUPS:

Project Pitch Plan

Solution:

Stance (summary of argument to defend it):

How it works with water dynamics (currents, winds, waves):

Pros:

Cons:

Your pitch to the judges should include the following elements:

- Creative introduction: who are you, what is your solution and why is it ideal
- How is this solution collecting plastic
- How does it work with ocean current dynamics
- Pros and Cons

FOR JUDGES GROUP

Judging Solutions

Solution:

Stance (summary of argument to defend it):

How it works with water dynamics (currents, winds, waves):

Pros:

Cons:

Critical Questions:

Decision section

Rate each solution out of 10 and decide which group you will give the grant to.

Presentation

15 minutes

Each group has 3.5 minutes to present their solution

1. Stance
2. Creative introduction
3. How does it work with water dynamics (wind, waves, currents)
4. What are positive and negative aspects about your solution?

Conclusion of activity

5 minutes

Discussion Questions: What do YOU as a class feel was the best solution? What were some negative impacts you noticed of your own solution?

What do you think that you can personally do to address the issue of plastic pollution in the ocean?

Many answers possible: from personal/family consumption to activism to setting up new initiatives in your school/community