



PROJECT OCEANOLOGY



Marine Debris Shore Program Teaching Notes (1.25 hour program)

Overview:

Students will learn about the problem of marine debris and participate in a beach-clean up. On the beach students will work in small groups to define the problem of marine debris by discussing how it ends up on the beach and in the water. They will brainstorm potential solutions-ways to reduce the amount of marine debris- and evaluate those solutions as a group.

Logistics:

Students will be split into two groups just like any other shore program with 50 students. Half the students will participate in the marine debris shore program including the beach clean up while the other half the students work on a different lesson.

Note: this program would also work well as a lab/shore hybrid. In that case the **Beach Clean Up** would take place on the Avery Point Beach or near the rocks near the deck in front of the Branford House where people tend to fish, while the **Marine Debris Solutions** portion of the program would take place in the lab.

Materials:

- 8 tablets with the Clean Swell App loaded on them (including 1 hotspot enabled tablet). Located at the charging station between Ian and Brae's desks.
- 8 buckets (trash can be collected in these buckets and them dumped into trash bags in an effort to reduce the amount of plastic used)
- Nature Conservancy "Trash Collected" data sheet. Make sure it's the student or youth version. **This version does not include items such as condoms, syringes, tampons etc.**
- Trash bag(s)
- A crate of blue gloves for students to use if they wish (that we use during cold weather on the boats) *This is in an effort to reduce the amount of plastic garbage being generated
- Deck of laminated marine debris cards
- Laminated photos of possible marine debris solutions (ex. Trash skimmer, recycle, ban plastic bags)

Engage:

Show students an interesting piece of marine debris and have them pass it around and examine it or a photograph of an animal entangled in trash (these images are included in the Marine Debris Kit).

Explore:

Students are prepped with a brief safety overview before being split up into small groups (number of teams will be based on number of adults/ chaperones. Ideally, one adult will be assigned to each small group). Each small group is outfitted with a bucket or two to collect marine debris, a tablet open to the Clean Swell app to record the types of trash and amount collected, a clipboard/data sheet/ pencil as a backup record to the app and blue gloves to protect hands for anyone interested.

Key points to make during safety talk:

1. Be careful of sharp objects such as rusty nails, glass, etc. Do not pick those items up. Tell an adult.
2. If you are unsure of something you find, ask an adult for help!
3. Stay with your beach clean up team and meet back at an agreed location/time.
4. Start exploring the beach in search of marine debris.

Explain:

All teams gather after beach clean up. Each small group is asked to examine the marine debris they collected and then come up with a definition. *NOAA's definition of marine debris is considered any persistent solid material that is manufactured or processed and directly or indirectly, intentionally or unintentionally, disposed of or abandoned into the marine environment or the Great Lakes.* Basically, anything that's manmade and ends up in the ocean on purpose or accidentally would be considered marine debris. Next, ask students to brainstorm sources of marine debris and share those ideas with the larger group. Sources may come from the ocean or land. Ocean sources may include: fishing vessels, recreational boaters, stationary platforms such as oil and gas drilling, cargo ships and other vessels. Land sources may include: litter, illegal dumping, storm water discharge, lack of landfills/ recycling centers in some countries, natural disasters.

Elaborate:

Once students have an understanding of marine debris and where it comes from small groups will come up with possible solutions to this worldwide issue. Students can brainstorm solutions in small groups and think about these solutions in terms of 4 categories:

- Prevention
- Outreach
- Removal
- Research

We have laminated cards with these 4 categories on them, as well as laminated cards with possible solutions. Groups of students can be given a couple of cards and asked to think about what category their solutions fits into.

Students should also think in terms of...

- *What can you do?* Ex. use a refillable water bottle instead of a plastic bottle
- *What can my school do?* Ex. get rid of straws in the cafeteria, recycle paper and cans
- *What can my community do?* Ex. organize a beach/park clean up, discourage the use of plastic bags in local stores

Sorting Activity

Each student is given one or more small laminated cards with examples of marine debris that were actually collected during beach clean ups. Ask the students to sort the types of marine debris into categories. The categories can be determined by the students. Here are a few examples of ways students may sort items:

- Was it based on the source of the item? Ex. food and drink
- What was the item made of? Ex. plastic or metal
- What was the item used for? Ex. fishing gear, household items

Top 15 Marine Debris Sorting Activity

Give each student a card from the green deck of cards. These are the top 15 items collected according to the Nature Conservancy's data. Ask the students to arrange themselves in order from most common collected item to least common collected item.

Note: If this lesson is being taught as shore/lab hybrid students can easily graph or make a graphic of the marine debris data they collected. Materials would include large sheets of paper, markers, colored pencils, meter sticks.

Once the students submit their data to the Clean Swell app Callie and Debbie receive an email generated by Clean Swell with a tally of the total trash collected. This data can easily be shared with the participating teachers so they can graph in their classrooms. Be sure to let Callie and Debbie know who to share this data with.