SMILE High School Clubs _Activity 3

How Long Until It's Gone?

Time needed:
45 minutes

Materials needed:

- 20 feet of yarn
- 10 marine debris timeline tags
- 10 marine debris items
- 10 clothespins

More challenges:

- Have students investigate the relationship between decomposition rate and marine debris distribution in the ocean. Test the items in water, do they float or sink? Create other similar experiments.
- Have the students research and create more specific time tags to other kinds of marine debris.

Background

Ocean waters are being filled with marine debris, mostly coming from land and urban runoff. The diverse types of marine debris become a threat to wildlife, human health and safety, and directly affect the livelihoods of those involved in the fishing industry, tourism and recreation. Some debris can travel across the globe through ocean currents and can take hundreds of years to break down. Because marine debris decomposes at varying rates, some things like paper can be gone in as little as a few weeks, while other things like plastic or glass may take hundreds of years or may never decompose.

Objective

Students will identify decomposition rates for certain types of marine debris. They will better understand how long the debris takes to break down and make associations with the significance of having marine debris in our oceans' waters.

Procedure

P.S.: Some of the marine debris items necessary for this activity and that are harder to obtain are provided in this kit. Other you will have to obtain on your own. Feel free to be creative and find other materials other than the ones listed, create new timeline tags and modify the activity as you see fit.

1. The 20 feet yarn represents the timeline of 600 hundred years, through which each of the debris items should be placed in order of decomposition time. Use the clothespins to attach the marine debris timeline tags to the yarn in a crescent order. Place tags approximately two feet apart to allow room for groups working simultaneously.
2. Place the 20 feet tagged yearn in a straight line on the top of a table (s), the floor, or any other surface with enough space to allow students to work together moving through the timeline.
3. Divide students in groups of 4-5. Distribute each of the marine debris items to all groups.
4. Have the groups place the marine debris items at the timeline and by the tag they believe represents their respective decomposition rate. Groups rotate placing their debris items along the timeline, so that each tag will have an item for all groups.
5. Discuss decomposition factors of each marine debris item. After

discussing each one, ask the groups to look back at that particular item in its current location on the timeline and decide whether they want to keep it or move it to another tag. Repeat the procedure until all item are discussed and dislocated (if decided upon).

6. Review the correct decomposition time for each marine debris item, beginning at 0 years and finishing at 600 years. The correct order is available in the marine debris "How long until it's gone?" answer key sheet provided.

Questions to consider asking students throughout process:

- Which of the marine debris items do you think are among the most common and why?
- How does commonality relates to the debris' decomposition rate? Do we observe more debris with higher decomposition rate more often that the ones with a lower decomposition rate? Why or why not?
- How does decomposition rate correlates with the marine debris distribution in the ocean?

Resources:

This activity was adapted from the Marine Debris and Me Curriculum. The university of Georgia Marine Education Center and Aquarium:
http://nsgl.gso.uri.edu/gaus/gause09001.pdf

Other resources :

- NOAA Marine Debris Program:
  http://marinedebris.noaa.gov/welcome.htm

- EPA – Environmental Protection Agency:
- http://www.epa.gov/gmpo/edresources/debris_t.html
-
- Pocket Guide to Marine Debris/ Ocean Conservancy:
  http://www.cobsea.org/cleanupeas/docs/ICC_PocketGuide_EN.pdf
  http://www.oceanconservancy.org/our-work/marine-debris/

Marine Debris: How long until it's gone?

Answer Key Sheet

Ten common marine debris and their decomposition rates are listed bellow. It is important to note that the rates (which are commonly shared among different informational sources) do not indicate complete biodegradation, but rather rates of fragmentation.

10 marine debris time tags (in order of decomposition time):

1. Newspaper = 6 weeks
2. Cardboard box = 2 months
3. Cigarette butts = 1-5 years
4. Plastic grocery bag = 10-20 years
5. Styrofoam Cup = 50 years
6. Aluminum can = 200 years
7. Plastic beverage holder = 400 years
8. Disposable diapers = 450 years
9. Monofilament fishing line = 600 years
10. Glass bottle (Represented by the marbles) = undetermined