



Hawai'i Wildlife Fund: Marine Debris Keiki Education and Outreach (MDKEO) Program

Lesson 3- Solutions At Work

Grades: K - 5

Theme: Solutions: Marine Debris Prevention and Cleanup

Time: 60 minutes or extended 120 minutes

Summary

Students will participate in a comprehensive review of repeated concepts and vocabulary words. They will explore and discuss different solutions to the marine debris problem. Students will also brainstorm new creative solutions through art. Students will be asked to make a commitment to decreasing their plastic consumption by signing a Plastics Pledge.

Objectives

- Review current solutions to the marine debris problem
- Brainstorm new solutions to the marine debris problem utilizing art

Background

Marine debris is a threat to our environment, water navigation safety, our island's economy, and to human health¹. From all over the world, massive amounts of plastics, metals, rubber, paper, textiles, derelict fishing gear, vessels, and other lost or discarded items enter the marine environment every day. There is no part of the world left untouched by debris and its impacts. This makes marine debris a global and everyday problem. One upside of marine debris is that it is *preventable*. Marine debris objects are made by humans, and as such humans will be able to stem this tide of debris.

¹ OR&R's Marine Debris Program: Discover the issue.
<https://marinedebris.noaa.gov/discover-issue>

In order to prevent marine debris it is important to know its sources:²

1. Litter dropped in towns and cities
2. Overflowing litter / rubbish bins
3. Litter dropped at the beach
4. Poorly managed industrial waste discharges
5. Lost shipping containers
6. Lost / discharged fishing gear
7. Recreational litter blown by the wind
8. Poorly managed landfill sites
9. Microbeads from personal care products
10. Sewage related to litter

It is helpful to first identify the sources of marine debris and then to find solutions that address each source. For different solution ideas see [Resources](#) and the following list of “Eleven Things *You* Can Do To Reduce Marine Debris” created by HWF:

1. Reduce, reuse, recycle, and refuse single-use plastics! Choose reusable items and fewer disposable ones.
2. Place all rubbish in trash cans with lids so it doesn't blow away. Keep streets, sidewalks, parking lots, and storm drains free of trash as they empty into our oceans. Throw all cigarette butts and bottle caps into refuse containers!!!
3. Encourage your tackle shops, docks, marinas, and fishing piers to provide adequate trash cans and recycling bins for used line and other trash. Bring your oil cans, food wrappers, and cigarette butts back to shore. For information on how to recycle monofilament click [here](#).
4. “Paper or plastic?” Neither!!! Remember to use your reusable shopping bags (www.reuseit.com). In addition, “Less is more” – be mindful to select products with minimal packaging!!
5. Instead of continually purchasing plastic-bottled water, use water filters, water coolers, and refillable metal and glass bottles instead of purchasing bottled water (www.libertybottles.com).
6. Buy soft drinks in aluminum cans or glass, which can be redeemed and recycled (not down-cycled like plastic). If you have to purchase something in plastic, select types that are recyclable locally.

² Clean Coasts: Marine Litter. Avail at: <http://cleancoasts.org/marine-litter>

7. Encourage restaurants to use biodegradable products (or at least #1, #2 & #5 recyclable plastic for Hawai'i Island) take-out food containers and utensils. Better yet, bring your own utensils and to-go ware! (www.lifewithoutplastic.com and www.to-goware.com).
8. Avoid over-packaged merchandise, disposable lighters, razors, cameras, foam cups and clam-shell containers, and other throw-away items (www.ecocycle.org). Stay away from single-use plastics.
9. Avoid body care products containing tiny plastic "microbeads" that wash down the drain into our oceans (solution: make your own bath products – or use refillable products at your local natural food store). For more information on banning microbeads click [here](#).
10. Serve as an example to others. Practice 1 – 9 above and participate in local beach cleanups. To learn more about marine debris in Hawai'i please visit www.wildhawaii.org (or contact kahakai.cleanups@gmail.com) or <http://marinedebris.noaa.gov/marinedebris101/welcome.html>!
11. Write to your city / county council members and state representatives. Submit testimony about proposed legislation that may affect the sustainability of your local community (e.g., plastic bag bans, expanded polystyrene (eps) foam bills). Participate in democracy.

Activities list

- Marine Debris Bingo (grades 3-5) - printed handout
- [NAMEPA Plastics Pledge](#) (grades K-5) - printed handout
- [NOAA Marine Debris Art Contest](#) (grades K-5)

Materials

- Marine Debris Bingo cards (6 per 1 sheet of paper)
- Prizes (i.e., bookmarks, stickers or NOAA Marine Debris Calendars) for winners of Bingo (all students should earn a Bingo)
- [NAMEPA Plastics Pledge](#) for each student
- Art activity materials: Paper, coloring materials (crayons, colored pencils) or paint, and [examples](#) of other artwork

Procedure

1. Complete a comprehensive concept and vocabulary review by playing “Marine Debris Bingo.” (25 min)
 - a. Utilize the “Marine Debris Bingo” slideshow provided. Each slide has a definition and photo(s) that correspond to a vocabulary word on their bingo card.
 - b. Read through each slide and instruct the students to color in the vocabulary word that best fits the definition/photo on the slide. Explain that they may not always choose the correct vocabulary term, but that everybody should earn a bingo by the end of the game.
 - c. Play until the end of the slide show and repeat slides as necessary until every student earns a bingo/prize.
2. Begin the “Lesson 3 Solutions Presentation”. (17 min)
 - a. Define a “Solution” (slide 2) (4 min)
 - b. REDEFINE the “problem” (marine debris) and review the impacts of marine debris. (slide 3) (4 min)
 - c. Utilize slide 4 to identify sources of marine debris. Have students discuss/brainstorm with a partner about ideas that stop marine debris at the source. (slide 4) (5 min)
 - d. Write student ideas/solutions on the board and review other solutions. (slide 5 and 6) (2 min)
 - e. Ask students “What can YOU do to help prevent Marine Debris?” Get the kids to think about smaller, day to day actions they can take (i.e. Bring Your Own (BYO) water bottle, remind adults to BYO bags, to-go containers etc., (see [list](#) in ‘Background’ section).
 - f. Continue to slide 6 and give some more waste reduction ideas. (2 min)
3. Introduce to students the [Plastics Pledge](#), a simple but impactful marine debris solution that can be instantly accomplished. Students may come up with their own pledge: Ask them to spend a few minutes with themselves to come up with a realistic pledge (i.e. “I will pick up 10 pieces of trash every time I go the beach,” or “I will help my parents remember to bring their reusable bags to the grocery store.”). Have students share their pledge aloud to the class. (18 min)
4. *Optional* extended hour lesson: If students did not already brainstorm, art, as inspiration and education, can inform students and provide a platform for sharing solutions. The last slide introduces NOAA’s Marine Debris Program Art Contest. This is a solutions-based art activity that can be done as a supplemental activity, homework, or extra credit. (grades K-5)
 - g. Contest information can be found [here](#).
 - h. Intro to art activity (15 min)
 - i. Art activity (45 min)

Resources

[An Educator's Guide to Marine Debris](#)

Plastics Pledge, pg. 26

Examples of Innovative Solutions

[Baltimore Trash Wheel](#)

[Plastic Bag ban in Hawaii County](#)

[Adidas makes a shoe from Ocean Plastic](#)

[Bureo Skateboards](#)

[NOAA Marine Debris Solutions](#)

[The Honolulu Strategy](#)

[Hawaii County Zero Waste Initiative](#)

Additional Resources

[An Educator's Guide to Marine Debris](#)

[Hawai'i PRISM Curricula](#)

[NOAA: Guidebook to Beach and Waterway Cleanups](#)

[Protect Our Ocean Activity Book](#)

[Understanding Marine Debris: Games And Activities For Kids Of All Ages](#)

Vocabulary

Solution

Recycling

Innovation

Refuse

Hypothesis

Reduce

Educated Guess

ReUse

Benchmarks:

NGSS Lead States. (2013). Next Generation Science Standards: For states, by states. Washington, DC: The National Academies Press.

Grade K:

K-ESS3- 3. Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.

Common Core State Standards Connections:

ELA/Literacy – RI.K.1 With prompting and support, ask and answer questions about key details in a text. SL.K.5 Add drawings or other visual displays to descriptions as desired to provide additional detail.

Grade 1:

1-LS1- 1. Use materials to design a solution to a human problem. LS1.D: Information Processing. Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive.

Common Core State Standards Connections:

ELA/Literacy RI.1.1 Ask and answer questions about key details in a text. RI.1.2 Identify the main topic and retell key details of a text. W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.

Mathematics – MP.5 Use appropriate tools strategically.

Grade 2:

K-2- ETS1-1. Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development

Common Core State Standards Connections:

ELA/Literacy W.2.8 Recall information from experiences or gather information from provided sources to answer a question.

Mathematics- MP.5 Use appropriate tools strategically.

Grade 3:

3-LS4- 3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

3-LS4- 4. Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.

Common Core State Standards Connections:

ELA/Literacy – RI.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. RI.3.2 Determine the main idea of a text; recount the key details and explain how they support the main idea.

Mathematics – MP.5 Use appropriate tools strategically.

Grade 4:

4-LS1- 2. Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.

4-PS3- 3. Ask questions and predict outcomes about the changes in energy that occur when objects collide.

Common Core State Standards Connections:

ELA/Literacy – SL.4.5 Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes.

Grade 5:

5-ESS3- 1. Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources and environment.

Common Core State Standards Connections:

ELA/Literacy – RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. SL.5.5 Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.