



Educator's Guide: Unwrap the Waves

Unwrap the Waves with LMC:

According to Stanford University, Americans discard 25 percent more trash between Thanksgiving and New Year's than any other time of the year. This extra waste is estimated to produce an additional 25 million tons of garbage. Unfortunately, most of this garbage will clog our already overfilled landfills, but some of this trash will end up in local aquatic ecosystems such as ponds, lakes, and the ocean. This debris is threatening to wildlife that may become entangled, or even ingest, this debris.

Help reduce this reality. Join Loggerhead Marinelife Center in the *Unwrap the Waves* candy wrapper recycling program to help combat holiday waste while involving school children in conservation education. We hope this guide helps get your students into the "spirit" of conservation and sustainability this holiday season!



Lesson Objectives

- I am aware of the excess trash produced during a single holiday
- I can identify ways in which trash can get into our oceans
- I can explain ways in which marine debris can harm animals
- I can recognize ways in which humans can impact the environment



NGSS Benchmarks

Grades K-2:

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

Grades 3-5:

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

Grades 6-12:

MS-ESS3-3 Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment

HS-LS2-7 Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity



Grade Level: K-12

Subject: Science

Marinelife.org

Ocean Literacy Principles:

#6. The ocean and humans are inextricably interconnected.

Vocabulary:

- **Conservation:** Prevention of the wasteful use of a resource
- **Garbage Patch:** concentrations of marine debris in the ocean
- **Landfill:** a site to dispose of waste material by covering it with soil
- **Marine Debris:** 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 Great Lakes
- **Microplastics:** Small plastic particles in the environment that are generally between 1-5 mm, or microscopic
- **Pollution:** Anything added to the environment that is harmful to living things
- **Recycle:** Converting waste into reusable material
- **Sustainability:** Avoidance of the depletion of natural resources in order to maintain ecological balance
- **Waste Management:** includes the collection, transport, treatment, and disposal of waste

Resources for Student Engagement

Unwrap the Waves Informational Video (2020)

Engage your students in conservation and sustainability this holiday by introducing them to the Unwrap the Waves initiative at Loggerhead Marinelife Center! Informational video provided by LMC on YouTube (02:27): <https://www.youtube.com/watch?v=XAZy4wPE1SU>

Trash Talk with NOAA

Introduce the students to marine debris, including how it gets to our oceans and how it is impacting our marine life by showing three, short *Trash Talk* Informational videos created by the NOAA Marine Debris program.

Video 1: What is marine debris? (2:06)

https://oceantoday.noaa.gov/trashtalk_whatismarinedebris/welcome.html

Video 2: Where does marine debris come from? (2:02)

https://oceantoday.noaa.gov/trashtalk_wheredoesmarinedebriscomefrom/

Video 3: Impacts of marine debris (1:33)

https://oceantoday.noaa.gov/trashtalk_impacts/welcome.html

Begin a short class discussion, asking questions such as: What are examples of marine debris? How does marine debris reach our oceans? What is at least one impact marine debris has on our oceans?

#30DaystoZero Waste Challenge (2020)

During the month of April, Loggerhead Marinelife Center challenged students, teachers and global citizens to participate in the Center's [#30DaysToZero](#) (Waste) challenge. Eco-advocates across the globe took the challenge and shared their tips for striving for zero waste. Check out their tips for striving towards zero waste in the video provided by LMC on YouTube (03:08): <https://www.youtube.com/watch?v=XUI2DqbN9d0&t=26s>



Resources for Student Exploration

The following activities and corresponding worksheets are provided for student exploration and are identified by appropriate grade level.

Campus Cleanup and Trash Timeline (Grades K-5)

Students will conduct a clean-up of the outdoor space on their campus in order to participate first-hand in a conservation strategy to help reduce pollution and positively impact the environment. They will then use the debris collected to complete the following activity:

Put a timeline on trash! Students will gain knowledge about decomposition of common trash items by using the trash found during their campus cleanup! Cut out the time cards and spread them across the room randomly on the floor. Give each student a trash item and give them a few minutes to go around the room and decide which time card reflects the decomposition time they feel suits their trash item. Determine who guessed correctly or incorrectly and move the incorrect groups to their correct decomposition time. Finish the activity by discussing which items could have been thrown away, recycled, or composted.

Submit your data for Citizen Science!

Put your debris data to use by filling out our Campus Clean-up Data form! The data will help us to understand what debris items are having the biggest impact on school campuses. Click the link:

<https://docs.google.com/forms/d/e/1FAIpQLSfSu0yI7gG8vsMTAVOJBX9-K7mCFPQyKopOY-c8BJ2C7shv3Q/viewform>

Plastics in your home! (Grades K-12)

Just how much plastic do you use in your everyday life? Take an inventory of all of the plastic you can find in your home using the following worksheets. Look closely! Plastics can also be found in the form of chemicals or fibers (polyethylene or polypropylene) in everyday items such as clothing, utensils, cosmetics, and personal-care items.



Put a Timeline on Trash!

Follow the directions outlined in the Exploration section of lesson for the Trash Timeline Activity.

Decomposition/Break Down Rates	
Material	Time required to break down
Paper Towels	2-4 weeks
Apple Core /Orange Peel (Add this in at the last minute. Do not store these in the plastic bag.)	2-4 weeks
Newspaper	2-4 weeks
Plain Cardboard (unwaxed)	3 months
Cotton cloth	3-6 months
Rope	1 year
Waxed Milk Carton	5 years
Cigarette	1-5 years
Disposable Diaper	10-20 years
Steel Can	80-100 years
Aluminum Can	200-400 years
Ziploc™ Bag	300 years
6-pack Ring	400 years
Plastic Bottle	450 years
Monofilament Fishing Line	600 years
Glass Bottle	Thousands to millions of years
Styrofoam™	????? Unknown

5 Years	600 Years
10-20 Years	Thousands to Millions of Years
80-100 Years	3 Months
1-5 Years	300 Years
400 Years	600 Years

Bathroom Plastic Audit

Plastic Item	Yes	No	Sustainable Alternative
Plastic toothbrush			Bamboo toothbrush
Plastic toothpaste tube			Toothpaste tabs, toothpaste in glass jar
Plastic floss & container			Silk floss in glass container
Plastic hand soap dispenser			Bar of soap
Plastic razor and handle			Safety razor
Plastic deodorant tubes			Glass deodorant jar, cardboard deodorant container,
Plastic shampoo and conditioner bottles			Shampoo/Conditioner bars, aluminum shampoo/conditioner containers
Plastic body soap container			Bar soap
Plastic shower loofah, back scrubber, sponge			Natural bath sponge, natural luffa (made from plants!)
Plastic cotton swab sticks			Cardboard or reusable swab sticks
Plastic packaged cosmetics			Bamboo, compostable or refillable packaging
Plastic trash can bag/liner			No liner or reusable bag
Plastic comb/brush			Wooden comb/brush
Plastic toilet paper wrapping			Paper wrapping
Plastic bathroom cleaning containers			Reusable and/or refillable containers

Kitchen Plastic Audit

Plastic Item	Yes	No	Sustainable Alternative
Plastic sandwich bags			Reusable glass containers, silicone sandwich bags
Plastic wrap			Beeswrap, reusable metal and glass storage containers
Plastic beverage bottles			Reusable glass, metal, or plastic bottles. Purchase beverages in metal or glass alternatives
Plastic kitchen utensils			Wood, bamboo, or metal utensils
Plastic cutlery (forks, spoons, knives)			Bamboo utensil set, metal utensil set
Plastic K-Cups/coffee pods			Stainless steel reusable k-cups
Plastic spice containers			Refillable glass spice jars
Plastic sponge and dish brush			Wooden brush
Plastic dish detergent bottles			Reusable, refillable containers
Plastic cleaning supply bottles			Reusable, refillable containers
Plastic dish washer pod container			Reusable, refillable or cardboard containers
Plastic wrapped paper towels and napkins			Reusable cloth and rags
Plastic trash can liners/bags			No liner or line bin with newspaper
Plastic produce and grocery bags			Reusable bags
Plastic packaging at grocery store			Buy bulk, local, and/or alternative and recyclable packaging choices when available



BATHROOM SUSTAINABILITY SWAPS

DISPOSABLE PLASTIC ITEMS ARE FOUND IN EVERY ROOM OF THE HOUSE, BUT MANY OF THEM CAN BE SWAPPED FOR MORE SUSTAINABLE ALTERNATIVES!

THIS

for

THIS



PLASTIC TOOTHBRUSH



BAMBOO TOOTHBRUSH



PLASTIC SHAMPOO BOTTLES



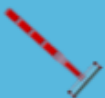
SHAMPOO BARS



PLASTIC Q-TIPS



BAMBOO/CARDBOARD Q-TIPS



DISPOSABLE PLASTIC RAZOR



METAL RAZOR



PLASTIC HAND SOAP DISPENSERS



GLASS HANDSOAP DISPENSER OR BAR SOAP

KITCHEN SUSTAINABILITY SWAPS

DISPOSABLE PLASTIC ITEMS ARE FOUND IN EVERY ROOM OF THE HOUSE, BUT MANY OF THEM CAN BE SWAPPED FOR MORE SUSTAINABLE ALTERNATIVES!

THIS

for

THIS



PLASTIC SANDWICH BAGS



REUSABLE BAGS & CONTAINERS



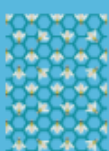
DISPOSABLE PLASTIC BOTTLES



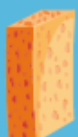
REUSABLE BOTTLE



PLASTIC WRAP



BEES WRAP



PLASTIC SPONGE



HEMP, COCONUT, OR CELLULOSE SPONGE



PLASTIC COFFEE PODS



REUSABLE COFFEE PODS

Resources for Student Explanation

The following activities and corresponding worksheets are provided as post-lesson materials and are identified by appropriate grade level.

Neighborhood Conservation Ambassadors (Grades K-12)

While eating more candy this year to collect wrappers may sound like a delicious idea, the *Unwrap the Waves* initiative and candy wrapper recycling program aims to bring awareness of how much waste is produced during one holiday. Rather than eating more candy, encourage students to become Neighborhood Conservation Ambassadors by safely collecting candy wrappers from family and friends. This way, students are not only removing more wrappers from the community but they are also involved in a larger effort to share what they know about holiday trash and sustainability.

Candy Count Student Worksheet (Grades 3-5)

In order to participate in the Unwrap the Waves school competition, schools are required to have a final count of wrappers in order to report to Loggerhead Marinelifelife Center. This worksheet is provided as guidance to encourage students and classrooms to count their own wrappers for their school.

Marine Garbage Patch Writing Exercise (Grades 6-12)

For this assignment, students will watch the video provided by PBS and *SciTech Now* called “Marine garbage patches are taking a toll on our ecosystem” which includes an interview with the Chief Scientist of the NOAA Marine Debris Program. Then, assign students a one-page summary report that answers the following questions:

1. What are marine garbage patches and where are they found?
2. How are marine garbage patches harmful to the ocean ecosystem? Give specific examples outlined in the video.
3. How is the NOAA Marine Debris program working to clean up these garbage patches?
4. What can YOU do in your community, or school, to reduce waste?

SciTech Now Video: <https://www.pbs.org/video/scitech-now-marine-garbage-patches-are-taking-toll-our-ecosystem/>

Candy Count Student Worksheet

Directions: Complete the following worksheet to determine how many candy wrappers your school saved from the landfill this holiday season!



In Your Classroom:

1. Number of candy wrappers you recycled: _____
2. Number of wrappers all students in your class recycled: _____
3. Total number of candy wrappers your classroom recycled: _____

In Your Whole School:

1. Number of candy wrappers your class recycled: _____
2. How many classrooms participated in the event? _____

Estimated amount of candy wrappers recycled by the school:
(# recycled by your class **X** # of classrooms) _____

Writing: How did collecting candy wrappers to be recycled help to save our ocean?

Resources for Extension

The following activities and corresponding worksheets are provided as extension materials to provide a conservation Call to Action for all students. Appropriate grade level is identified on each lesson.

Sustainable Candy PSA's (Grades K-5)

Guided by the information they have learned throughout the previous activities, students should design a digital or printed public service announcement, or informational poster, for their school or community. Each student project should include information on holiday trash and ways to be more sustainable this holiday season.

Teachers can share their student projects on social media by tagging Loggerhead Marinelifelife Center and using the hashtag #UnwraptheWaves.

Invasion of the Lollipop Sticks (Grades 6-12)

What do beaches in southeast Florida and New Zealand have in common? An abundance of plastic lollipop sticks washing up on both shores. Students will read through the Loggerhead Marinelifelife Center blog post, "Lollipop Lollipop: Invasion of the Plastic Lollipop Sticks" and answer the questions provided on the worksheet.

Article: <https://marinelife.org/2020/06/07/lollipop/>

Call to Action: The Conservation Department at Loggerhead Marinelifelife Center found that most of the plastic lollipop sticks that are washing up on our shore are from the candy brand *Chupa Chups*. In order to take action to improve the health of our planet, we need to encourage lollipop and other candy manufacturers to use sustainable sticks and wrappers!

Students are encouraged to take action for our planet by writing a letter to *Chupa Chups* explaining why it is important to switch from plastic lollipop sticks to a more sustainable alternative. Loggerhead Marinelifelife Center has provided a template and contact information.

Invasion of the Plastic Lollipop Sticks

Directions: What do beaches in southeast Florida and New Zealand have in common? An abundance of plastic lollipop sticks washing up on both shores. Read through the Loggerhead Marineline Center blog post, “Lollipop Lollipop: Invasion of the Plastic Lollipop Sticks” and answer the following questions regarding the article.

Article: <https://marinelife.org/2020/06/07/lollipop/>

1. How many plastic lollipop sticks were found during beach cleanups in Juno Beach over the course of seven days?
2. In what ways are plastic lollipop sticks threatening to marine life, such as sea turtles?
3. In what ways can you help reduce the amount of plastics found in our oceans?



Lollipop Call to Action

The Conservation Department at Loggerhead Marinelifelife Center found that most of the plastic lollipop sticks that are washing up on our shore are from the candy brand *Chupa Chups*. In order to take action to improve the health of our planet, we need to encourage lollipop and other candy manufacturers to use sustainable sticks and wrappers!

Take action for our planet by writing a letter to *Chupa Chups* explaining why it is important to switch from plastic lollipop sticks to a more sustainable alternative. Loggerhead Marinelifelife Center has provided the following letter template. You can send your letter via email at: <https://www.chupachups.co.uk/contact>

Letter Template:

Hello, my name is (FIRST NAME ONLY), I am (BLANK YEARS OLD).

I am writing to request your help with an issue I care deeply about. I want to present Chupa Chups with the opportunity to become a leader in sustainability in the candy industry by making a switch from the single-use plastic lollipop sticks you currently use in your products to a sustainable non-plastic alternative.

As you may be aware, sea turtles accidentally eat plastic trash, mistaking it for food. Loggerhead Marinelifelife Center (LMC), a sea turtle hospital and conservation center in Juno Beach, Florida, has found plastics in the stomachs of nearly 100% of post-hatchling sea turtles that enter their hospital. Since 2018, LMC has also removed over 3,000 plastic lollipop sticks from a 9 mile stretch of one of the most important sea turtle nesting beaches in the world.

Plastic lollipop sticks are single-use plastic items that may be used for a few minutes but will remain in our oceans forever, and it is my generation that will be responsible for cleaning up this plastic mess. To help protect our sea turtles and keep our oceans clean, I am writing to tell you that today's youth will gladly give up plastic lollipop sticks for sustainable, ocean-friendly alternatives.

On behalf of myself and all young people taking a stand for our planet, I challenge Chupa Chups to use a non-plastic, sustainable alternative to plastic lollipop sticks for your products. By eliminating plastic lollipop sticks, Chupa Chups can make a positive, lasting change that will benefit the oceans and wildlife for as long as your current plastic lollipop sticks will remain on our planet, which unfortunately is forever.

Thank you for your time, consideration, and future commitment to ocean conservation.

Sincerely,

(Your name here)

Evaluate

Answer the questions on the Exit Ticket (shown below).

Unwrap the Waves Exit Ticket

Using the Biodegradation Rates Timeline sheet, which common household item takes the most amount of time to biodegrade?

- a. Cotton cloth
- b. Glass bottle
- c. Rope
- d. Newspaper

What is the correct definition of marine debris?

- a. Anything added to the environment that is harmful to living things.
- b. Small plastic particles in the environment that are generally microscopic.
- c. An activity or action that generally helps an organism.
- d. Any solid material that is disposed of or abandoned into the marine environment.

Write one paragraph explaining at least one impact of Marine Debris.