

Cloverbud Investigators: Taking the Adventure Outside

Traveling Trash

Background: (Objectives) Investigators will understand what litter is, the places it comes from, how it travels, the dangers it can present, and what people can do to reduce the amount of trash we create.

The Ohio Environmental Protections Agency (OEPA) defines litter as “misplaced solid waste.” “According to a study conducted by the Ohio Department of Natural Resources, over 11,000 tons of litter collects on roadways each year. To put that into perspective that is 22,000,000 pounds of litter on our roads each year! To help the investigators visualize this fact, we can compare that amount to 1,375 dump trucks of trash. That is a lot of misplaced trash. *Where does litter come from?*



Where does litter come from?

Litter doesn't just magically appear. It can come from lots of places:

- Unsecured curbside trash
- Over-filled dumpsters
- Illegal dumpsites
- Household trash found on private property
- Construction or demolition sites
- Natural disasters that destroy structures and carry trash for many miles like tornadoes, hurricanes, and floods
- Unsecured vehicle loads
- Motorists throwing trash out of cars
- Pedestrians throwing trash on the ground

Discussion topic: *The main source of litter is people just like us!*

“LIKE US?” “Not me I never litter.” Odds are you have littered at some point and you might not even know it. Ask: Have you ever had something accidentally blow out of your car window? Have you ever overstuffed a trash bag to the point trash is hanging out the top or it is ripped? Have you ever stacked trash on an already full outdoor trashcan? Have you ever let go of a balloon and watched it fly into the sky? Have you ever left empty feed bags laying in the barn, only to have the wind blow them away? Have you ever fed the cat from the cat food can and later discover another animal carried the food can off? We have all been guilty, and we all must take responsibility, even if the trash you see isn't yours. The problem with trash is that it doesn't stay put; it likes to travel.

How does trash travel? Most trash is blown by the wind or carried by water. It's shocking just how far wind can carry litter. Scientists recently discovered plastic trash littering large areas around a weather station in a remote part of the French Pyrenees Mountains. Scientists believe



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the trash blew in from cities over 100 miles away. Water is another great transporter of trash. Water can carry trash from landlocked states like Ohio all the way to the ocean. The Great Pacific Garbage Patch is a huge trash-filled area of the ocean off the coast of the US between California and Japan. The garbage patch is thought to be twice the size of Texas! It's hard to imagine a trash island twice the size of Texas, created just by litter! Scientists believe the litter collects in this area due to water currents and gets trapped there.



Trash is not only costly to clean up and ugly to look at, but it is dangerous to wildlife. Everyday items such as soda cans and plastic bottles can be lethal to wildlife and pets. Animals often get their heads stuck in discarded cans, cups, and jars. Animals such as whales, turtles, and seabirds often mistake trash for food which can choke them or cause fatal stomach or bowel obstructions. *(Wildlife litter pictures are included with this lesson, to use when discussing the dangers of litter.)*



Trash poses a danger to human health. Discarded tires and containers can hold water and act as a breeding ground to mosquitoes and biting flies that carry disease. All that plastic that is building up in our oceans. It is not only killing the wildlife, but it is breaking down into tiny toxic particles that are ending up in our food chain.

How do we stop the trash from traveling? You may have heard of REDUCE, REUSE, RECYCLE! But there is more you can do. Let's talk about RECOVER and RETHINK.



Reduce - The best way to reduce waste is to not create waste! Making a new product each time requires raw materials, energy, and it is expensive. If we reduce what we buy, then we will also reduce our waste. An example of reducing is buying reusable items instead of disposable. Things like washable silverware. Another example is buying bulk items which saves on packaging.

Reuse - Another great way to reduce waste is to reuse items. For example, you can buy used items like clothes from a consignment shop, or have items repaired rather than thrown out. You could also borrow, rent, or share items. You can also repurpose items into other things. Donating or selling unwanted items can also keep them from ending up as trash.

Recycle - You can collect materials and take them to be recycled. Items like glass, aluminum cans, and paper can be recycled. Composting is another way to reduce food waste, and it improves the soil.

Recover - Find ways to recover trash and properly dispose of it. Create a recycling program where none existed before or organize a litter pick up event.

Rethink - Change the way you think and the way you buy products. Look at how you will reuse or recycle something before you buy it.



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Month's Mystery: How does trash travel?**Activity 1. Operation Trash Investigation**

Do ahead: Print out litter flashcards label trash bags using masking tape according to common types of trash (paper, glass, metal, plastic, etc.)

***Supplies:***

- Trash bags
- Masking tape
- Trash pickup device
- Gloves
- Litter flashcards
- Cell phone
- Bright colored clothing or safety vest if going near a road

Procedures:

Tell the Investigators, “Today we are going to do some trash talking! I don’t mean talking bad about somebody. I mean having a serious talk about all the litter in our environment, the place we live and share with others.” *Ask*, “*Have you noticed the litter outside?*” Invite them to guess how many pieces of litter they might find on a quick outside walk. Record their guesses. Next, using the litter flashcards included with this lesson, go over some of the commonly found litter items and discuss if they are made from paper, plastic, glass, metal, or something else. Ask them to guess which material they think they will find the most during their investigation and record their estimates.

Next, grab your labeled trash bags, gloves, and trash pickup devices along with your cell phone and head outside to see just how many pieces of litter you find. **Safety note: Never pick up trash with your bare hands, and always instruct children to never touch anything until the group has investigated it first.**

Give the following instructions: *This is a scientific investigation. Our mission is to investigate, observe, record, and if possible, collect for proper disposal of the items of trash we find.* Explain that before any item is TOUCHED, they will need to establish what it is, is it safe to touch, and decide which bag it should go in. Before going outside, explain that everyone is on the same team, but each has a different job to do so they must stick together. Assign everyone a job: bag carriers, photographer, item recorders, pick up tool carrier, item spotters, glove-wearing item touchers, etc. Proceed outside after you have given them any additional safety instructions regarding traffic or the location you will be searching. As you find a piece of litter, stop, identify the litter (paper, plastic, etc.), and record your location with a picture. Look around and discuss where it might have come from. *Is it close to the road? Could it have been thrown out of a car window? Is there a trash can nearby? Could it have blown out of the trash? Is it near a creek? Could the water have brought it from somewhere else?* Once you have established what the litter is and if it is safe to pick up, then you can put it into your labeled bags using either your pickup tool or gloves.

Once all the litter has been identified and collected, have everyone wash their hands or use hand sanitizer, even if they were wearing gloves or taking pictures.



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Go Over Findings:

Now it is time to go through your research. Using your camera and notes count the pieces of litter collected. *Was anyone close with their guess? Next, what kind of litter was collected the most: paper, plastic, metal? Was anyone correct? Did these findings surprise anyone? What was the craziest thing found? Was there anything that could have been dangerous if touched? Was there anything that could have been dangerous to wildlife? What did you learn?*

Activity 2: To demonstrate how our trash ends up in the ocean.**What to Do:**

Play the game “Sum of the Parts” from Project WET a brief description is below. For more information visit www.projectwet.org

Where do you think all that trash along the roads ends up?
(Downstream activity)

- Have Investigators select an item from your clean trash that they use every day like a plastic cup, piece of paper, batteries, aluminum can, etc.
- Investigators then line up in a row. The first couple people represents a small backyard stream. The next couple represents a larger creek, the next couple represent a river and finally the last person in the row represents the ocean. The person representing the ocean should hold a large container like a clothes basket.
- You can make up a story to show how the litter each child tosses out adds to the next person’s as litter collection goes down the line, or simple have each person in line “toss out their litter” into their waterway by handing it to the person downstream.
- One by one the trash moves down the line to the end which is the ocean.

Optional – After activity 3 below, play the “Sum of the Parts” game again but reverse the flow. Ask them what if we each kept our one item from going into the ocean. Then pass the ocean container back up stream with each investigator taking out their one item. Ask, what effect did it make on the ocean?

Activity 3. The Life Span of Trash

Objectives: Investigators learn how long it takes for some trash to breakdown and help them “RETHINK” their purchases.

Do ahead: Print the flash cards, label your clean trash items with how long it takes them to break down, and put them in a clean trash bag. (See sample list below.) Another fun option is to draw a big bug on a large sheet of paper and label it the “litter bug” or create a real life litter bug by making a “litter bug costume”, tape or attach different pieces of litter to the litter bug for kids to pick from while going over how long it takes for that object to break down once it is thrown away.

What to do: *Making a bag, draw a litter bug or making a costume, then ask how long do you think this trash would have laid there if no one picked it up?*

Supplies:

- Clean trash items
- Large container
- Picture of the Great Pacific Garbage Patch

Supplies:

- Clean trash items
- Reduce, Reuse, Recycle, Rethink Flashcards



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1. Let each child pick a piece of clean trash.
2. Let them take turns reading how long it would take for their object to break down if it were tossed out as litter.
3. As a group decide if the selected object would be better to reduce use of that object, reuse that object for something else, or recycle that object. Place those items under the proper label card.

For example: Styrofoam never truly breaks down in nature and can be very hard to be recycled. So, reducing your use of Styrofoam would be the best option. Aluminum cans can be recycled many times, so recycling is the best option. Clothing is not easily recycled so reusing it is the best option.

Use the table below or you can lookup the life spans of the trash you selected.

Sample of average trash life span and amount of times it can be recycled

Item	Time to biodegrade	Times it can be recycled
Paper Towel	2-4 weeks	0
Paper Bag	1 month	2-4 times
Cardboard	2 months	4-8 times
Cotton Fabric	3 months	1-2 times
Nylon Fabric	30-40	0
Wool Fabric	1-5 years	1-2 times
Plastic Cups	50 years	1-2 times
Plastic Containers	50-80 years	1-2 times
Plastic Bottles	450 years	1-2 times
Plastic Bags	200 years	1-2 times
Aluminum Can	200 years	Up to 1000
Tinfoil	400 years	0-1
Leather Shoes	25-40 years	0
Cigarette Butts	10-12 years	0
Disposable Diapers	450 years	0
Fishing Line	600 years	0
Batteries	100 years	1
Styrofoam	never	1
Glass bottle	1 million years	Up to 1000
Metals	200-500 years	Up to 1000



Science Behind: Paper products have a limited recycle lifetime of about 5-7 times before the fibers become too degraded to be reused. Most plastics can only be recycled once or twice before they become too degraded to reuse. However, metals, glass, and aluminum cans have an unlimited recycle lifetime. In fact, it is cheaper to use recycled glass and metal than it is to create new. When we recycle these items, we are also saving cost and energy. Some things that could be recycled are not able to be recycled due to contamination. For example, pizza boxes absorb the grease of the pizza which contaminates the cardboard and makes it unusable. Aluminum foil is another product that if contaminated with food cannot be recycled. Some products like Styrofoam cannot be recycled. For helpful recycling tips, check with your local solid waste agencies.



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Discussion:

How do you think your trash might end up where it does not belong?

Possible answers

- Dogs get in your trashcan
- Wind blows something out of your car
- You toss it out a window
- The garbage truck drops a bag of trash out of the back while driving
- You leave trash behind after a picnic or beach visit
- You put your trash in a trash can that is overflowing
- The rain washes away your trash bag
- A big storm comes and blows everything out of your garage or barn
- You let go of your helium balloon
- You drop your pop can off a bridge
- Your bag of chips blows out of your boat
- You pile up trash next to the creek



What are the two main ways trash can travel? (Wind and Water)

What are some of the things we can do to help with our traveling trash problems?

- Organize litter pick up events.
- Make sure you properly disposed of unwanted items.
- Set an example for others by not littering and picking up litter you see.
- Carry a litter bag in your car, boat, and on your bicycle.
- Securely cover trash containers to prevent wind or animals from spreading litter.
- Cover and secure any vehicle, truck or trailer carrying a load. Tarps can prevent litter from falling or blowing onto the roadside.
- When visiting parks and recreation areas, make sure to leave the area clean for the next person to enjoy.

The State of Ohio also offers excellent opportunities for volunteers to participate in clean-up programs: the [Adopt-A-Highway program](#), sponsored by the Ohio Department of Transportation, as well as the [Adopt-A-Waterway program](#) sponsored by the Ohio Department of Natural Resources.

What are some ways you can reduce waste?

- Take your own bags to the grocery store
- Don't buy bottled water; use your own water bottle or water filters
- Avoid one-use items like paper plates, plastic silverware, and cups
- Avoid plastics and Styrofoam
- Donate unwanted items to a thrift store
- Set up a recycle center in your home
- Go paperless with your bills (online BillPay)
- Compost food waste
- Grow some of your own food to reduce buying processed packaged food



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- Repurpose items (like making a tire swing or raised bed garden out of tires)

Taking the Adventure Outside: Activity 1, is designed to take the adventure outside with “Operation Trash Investigation”. Additional outdoor adventures could include making a bird house or feeder out of recycled materials and hanging it up outside.

Take a field trip to a recycling center, and recycle the litter found in Activity 1, ask to tour the operation and learn more about how recycling works.

Career Connections: Solid Waste Management, Environmental Protection Agency, Environmental officers on cruise ships and in corporate businesses.

Investigate, Create, & Take: Investigators can take with them:

Don't be a litter bug!

Using recycled materials let the investigators make their own “litter bug”

RETHINK- REDUCE- REUSE- RECYCLE- RECOVER



Sources:

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Rethink

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Recycle

Recycle

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Reduce



Zero Waste



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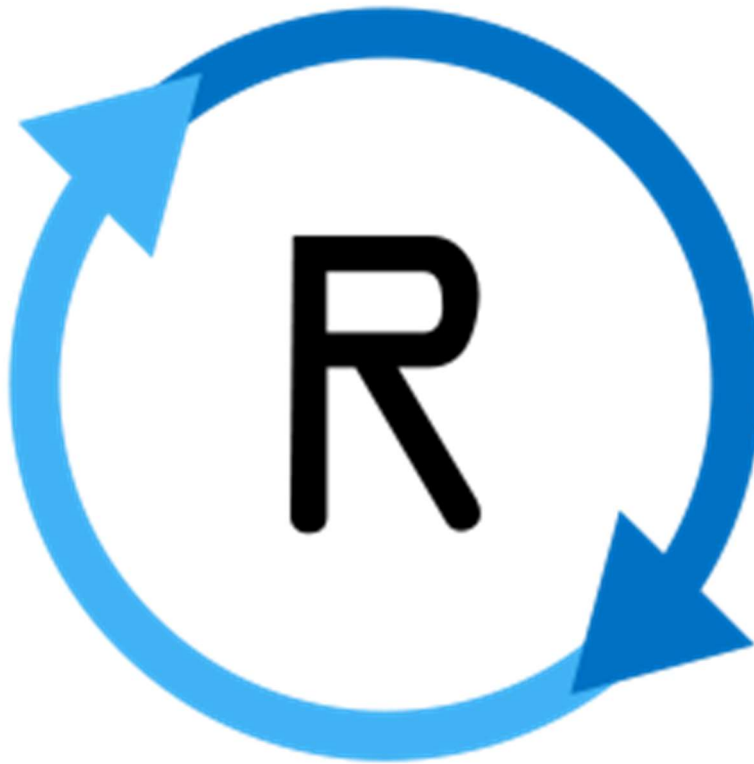


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Reuse



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Types of litter flash cards



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Great Pacific Garbage Patch



Overall: Great Pacific Garbage Patch: trash from the East Coast of China, Korea, and Japan has collected in the Pacific Ocean and estimated to be the size of Texas



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