

# Recycle for Nature



## Submitted By:

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## Overview

Students will learn about recycling in their community and how they can reduce waste in their everyday lives.

## Grade Levels

1<sup>st</sup> grade, 2<sup>nd</sup> grade, 3<sup>rd</sup> grade, 4<sup>th</sup> grade, and 5<sup>th</sup> grade

## Curriculum Correlation

1.L.1.3, 1.G.2.1

2.G.2.2

3.C&G.2.2

4.L.1.3, 4.G.1.2

5.G.1.2

## Duration

Divided into small lessons for 1 school week

## Location

Outdoors and in the classroom

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## Materials

### Waste Bin Challenge:

- Two plastic trash bags per student (drawstring or twist tie closure)
- One 3- by 5-inch note card per student
- One to two plastic tarps
- One set of gloves per student
- One scale
- One copy of Waste Bin Challenge Worksheet for each student

### From Trash to Treasure:

- Art supplies: glue, scissors, paint, construction paper
- Index card with: student's name, art piece title, and what trash was transformed

### Recycle Relay:

- 1 basket, bin, or bucket to hold recyclables for each team
- 1 basket, bin, or bucket for recyclables: Plastics, Glass, Paper, Aluminum/Tin
- Recyclable items, enough for each team to have an example of each type of recyclable.
- Permanent marker to label recyclables for each team (1, 2, 3, or 4)

### Trash Timeline:

- Print out attached trash photos and decomposition times.

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## Learning Targets

Students will learn what is trash, recyclable and compostable. Students will learn about local recycling methods. Students will see how much trash they accumulate and brainstorm how they can minimize their waste in the future. Students will also discuss how waste and recycling can positively or negatively affect their citizen science study animal or tree.

## Educators Information

What is Recycling? Recycling is the process of taking a product that can no longer be used and making another product from all or part of it. The internationally-recognized symbol for recycling is three arrows moving in a triangle. Each arrow represents a different part of the recycling process, from collecting used materials, to re-manufacturing them into new products, and then reselling them.

Why Recycle? Recycling offers many advantages, including:

- Reduces the consumption of raw materials
- Decreases air and water pollution
- Lowers energy usage
- Reduces the need for more landfill space
- Creates jobs
- Reduces waste disposal costs
- Generates revenues from the sale of recyclable materials
- Provides raw materials for industry
- Keeps habitats intact
- Reduces greenhouse gas emissions

The following Educators Information is from the EPA's, [The Quest for Less](https://www.epa.gov/sites/production/files/2015-09/documents/qfl_complete.pdf), Activities and Resources Guide. [https://www.epa.gov/sites/production/files/2015-09/documents/qfl\\_complete.pdf](https://www.epa.gov/sites/production/files/2015-09/documents/qfl_complete.pdf)

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Why Should Students Learn About Solid Waste? Despite the fact that individuals and communities are recycling more than ever, each person in the United States continues to generate about 4.4 pounds (EPA, 2003; 2001 data) of municipal solid waste per day! This statistic emphasizes the continuing need to teach the next generation about reducing waste and to energize schools and communities to promote environmental awareness.

What Is Solid Waste? Everyone produces solid waste (otherwise known as trash or garbage), whether it is old newspapers, potato chip bags, shampoo bottles, cut grass, food scraps from the dinner table, old appliances, or even the kitchen sink. Each person in the United States generates 4.4 pounds (EPA, 2003) of solid waste each day, which is often collected by a municipality and is known as municipal solid waste. This kind of waste primarily comes from people's homes, but it also comes from some factories, businesses, and schools. As our population has grown, so has the number of products we use and the total amount of solid waste we generate. Consequently, the composition of garbage continues to change with more plastics, more office paper, and less glass filling up trash cans around the country. The chart below illustrates the different components of municipal solid waste.

How Do We Manage Solid Waste? No single method can manage all our nation's garbage. The U.S. Environmental Protection Agency (EPA) recommends the use of a "waste management hierarchy," which ranks methods of waste management in order of preference.

EPA's waste management hierarchy includes:

- **Source Reduction.** Source reduction, also known as waste prevention, is the preferred method of waste management because the best way to manage garbage is to prevent it in the first place. As the name implies, this method prevents waste at the source by decreasing consumption and reusing products. For example, using a durable cloth lunch bag or reusing the same brown paper bag instead of a new brown paper bag each day prevents waste. It also includes using nonhazardous substitutes as an alternative to toxic products that could end up in the waste stream. For example, using baking soda to clean kitchen and bathroom counters rather than a chemical detergent prevents the disposal of toxins.
- **Recycling, including Composting.** If waste cannot be prevented, the next best way to reduce the volume of it that must be disposed is to recycle or compost it. Recycling refers

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to a series of activities where discarded materials are collected, sorted, processed, converted into raw materials, and used to make new products. Composting is the decomposition of organic materials such as yard trimmings and food scraps by microorganisms. The byproduct of this process is compost—a soil-like material rich in nitrogen and carbon that can be used as a plant fertilizer supplement. Both of these processes use waste as a raw material to create new and valuable products.

- Disposal: Combustion and Landfills. Trash that cannot be reduced, recycled, or composted must be disposed of. Combustion is the burning of waste in specially designed facilities often called incinerators. It reduces the bulk of waste, and some facilities provide the added benefit of energy recovery (“waste-to-energy” facilities). Landfills are also major components of waste management. A landfill is a large area of land or an excavated site that receives waste. Combustion facilities and landfills are subject to environmental controls that require them to be properly maintained so there is no waste run-off that might contaminate drinking water supplies. The portion of waste requiring combustion and land disposal can be significantly reduced by reducing, reusing, or recycling—the “3 Rs” of solid waste management.



## Procedure

### Waste Bin Challenge:

Activity from the EPA, The Quest for Less: Activities and Resources,  
[https://www.epa.gov/sites/production/files/2015-09/documents/qfl\\_complete.pdf](https://www.epa.gov/sites/production/files/2015-09/documents/qfl_complete.pdf)

Discussion: Start a discussion with students about where they think our waste/trash goes once we throw it away. Ask if students can name some sort of things that get thrown away. Is any of it recyclable? Ask students if they know what is recyclable in your area? How do they think trash/waste positively or negatively affects their citizen science study animal or tree or our environment?

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The Challenge: Explain to students that they are going to do a waste bin challenge. They are going to collect all of the waste they are throwing away (including items they might recycle if they do) for 4 days, collecting both at school and their home. Encourage students to be as honest as possible, that you will not be judging them on how much they throw away, but instead will be looking at how they can reduce their waste in the future and learn how to recycle and minimize their waste. Challenge students to remind each other to use their waste bins for the 4 days, collecting “dry” garbage only. Instruct students to include all of their used containers, paper waste, and packaging, but not to include food waste or any other type of “wet” trash that might decompose or be unsanitary. For safety reasons, instruct students not to collect glass items either.

Have the students put their names on the note cards and attach them to their 2 trash bags. Then have students use the drawstring or twist ties to close their garbage bags. Explain that at the end of each day, students will bring their “school” garbage bags back to the classroom and store them overnight in a designated spot (show them the location). The name tags will allow them to pick out their trash bag the next morning.

At the end of the 4 days, have students bring their “home” trash bag in to class. Ask the students to predict how much their individual piles of “school and home” trash weigh. Ask them to predict how much the total pile of garbage for the whole class would weigh. Write some of these predictions on the board.

Bring in a tarp and spread it on the floor. Have each student spread the contents of his or her personal trash bags on the tarp. Have the students put on gloves and sort their individual piles of garbage into as many categories as possible: plastics, aluminum, paper, tin, and mixed materials (those that fit into more than one category). Have them record the contents of their garbage piles using the Waste Bin Challenge worksheet.

Have students weigh their individual piles of garbage on a scale and record the amounts on the chalkboard.

Ask a student to total the weights of each individual pile of garbage and put this number on the chalkboard. Determine the average weight of trash generated per student per day. Compare these weights to the students’ predictions.

Write the national average of waste generation on the board: 4.3 pounds per person per day.

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Ask the students to determine the following:

- How much waste did the class generate per day on average? Is this higher or lower than the national average?
- If each person in your community (population\_\_\_\_) throws away \_\_\_ pounds (use the students' average calculated above) of garbage each day, how many total pounds of garbage are thrown away each day in your community?
- How many tons is this? (To help children grasp the concept of a ton [2,000 pounds] you might want to ask them how many tons some familiar objects weigh, for example, an average 4-door compact car weighs about a ton.)

Assessment:

1. Ask the students why they think they generate so much trash. Is it more or less than they anticipated?
2. Ask the students if they were surprised at how much trash they generated. Where does all of this waste go every day? Why should we care how much we throw away?
3. Ask students to look at their waste generation charts and think of ways they could have reduced the amount of garbage generated this week. (Could any items have been recycled or reused? What about using less in the first place? For example, bringing a reusable cloth lunch bag instead of a paper lunch bag each day.)
4. Ask students how they think we could help our local trees and wildlife from our waste? In what ways does our waste affect our local environment? What about our continent or the whole planet?

From Trash to Treasure Activity:

\*This activity is best done as an extension to the Waste Bin Challenge.

Once students have weighed their trash and filled out the Waste Bin Challenge worksheet, have them take a closer look at their trash and think how they could turn it into something new. Explain that students will use items from their own trash and turn it into a work of art. If your students are studying birds or squirrels, you could encourage them to make feeders,



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homes, or sculptures of birds and squirrels. If you are studying trees you could have them make tree-related art.

Have an assortment of art supplies handy for students to use to help transform their trash to treasure. Possible art supplies include; glue, scissors, paint, and construction paper.

Once all art creations are finished you can show-case them in your classroom or around the school. Have students make a label for the creation that includes their name, title of art piece, and what trash items they transformed.

## Recycling Relay:

Before the relay ask students who of them helps recycle at home? What type of recycling happens in your community? Is it mixed or separated? What type of recycling do you practice at school? Is it similar or different from at home. You may want to review recyclables with students, showing them your separate bins and what items go in each.

You will be splitting students up into 2 to 4 teams for the relay race. You will need to gather relay supplies ahead of time. You can use photos of recyclables or real recyclables (I find the real thing more fun). You will need to gather enough of each recyclable so each team has 1 (ex. 1 water bottle for each group, 1 crumpled piece of paper, 1 cardboard food box per group). Label each recyclable with the corresponding team number (1, 2, 3, or 4), this way when the students are done sorting the recyclables you can see which teams sorted all theirs correctly.

Game set up: You will need a large area outside for students to run around, a way to designate a starting and finishing line (chalk, string, flags, or the buckets), 1 bucket for each team filled with their recyclables at the starting line. At the finish line you should have all of the recycling bins for plastic, metals, paper, and glass.

Have students line up in their teams at their starting line bins. Explain to students that they will taking turns sorting the recyclable into the correct recycle bins. The student first in line in each team should grab a recyclable from their bin and run to the recycle bins at the finish line, sorting the item into the correct bin. Next the student runs back to the start to tag the next student in their team and so on.

Tell students that you are looking for the team that finishes first, but also the team that properly sorts all the items. You can add a trash and compost bin to increase difficulty, using



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photos for the items.

Once the teams have finished the relay sorting gather students together at the finish line to see how well they did sorting the recyclables.

## Trash Timeline Activity:

Students will sort photos of waste and make predictions about how long they think it takes trash to decompose.

Directions: Distribute each of the pictures and decomposition rates, one to each student. Try to ensure that no person holds both a picture and its associated time page.

Have students with the decomposition rates lay their cards down on the floor in order from shortest time to longest time.

Then have the students roam around trying to figure out what pictures match up with what time periods. As they make their matches, you can comment on their accuracy and have them try to correct any errors. See below for a list of the decomposition rates for common items:

Cigarette Butts-----1 to 5 years

Aluminum Can-----80 to 100 years

Plastic 6-pack Holder-----100 years

Banana Peel-----Up to 2 years

Plastic Bags-----10 to 20 years

Glass Bottles-----1,000,000 years

Plastic Coated Paper-----5 years

Nylon Fabric/rope-----30 to 40 years

Leather-----1 to 5 years

Tin Cans-----50 years

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## Supplemental Reading

Interesting stats and facts about recycling different materials in North Carolina:

<http://www.re3.org/facts.htm>

Landfill Diagram: <http://www.recycleguys.org/Documents/LandfillDiagram.pdf>



## Extensions

Worm Composting: Worms at Work Activity in EPA's, *The Quest for Less*, Activities and Resources Guide. [https://www.epa.gov/sites/production/files/2015-](https://www.epa.gov/sites/production/files/2015-09/documents/qfl_complete.pdf)

[09/documents/qfl\\_complete.pdf](https://www.epa.gov/sites/production/files/2015-09/documents/qfl_complete.pdf)

Recycling in Nature: Learning how fungi, bacteria, and bugs naturally recycle. Compost Critters Activity in EPA's, *The Quest for Less*, Activities and Resources Guide.

[https://www.epa.gov/sites/production/files/2015-09/documents/qfl\\_complete.pdf](https://www.epa.gov/sites/production/files/2015-09/documents/qfl_complete.pdf)



## Resources

Recycle signs/decals: <http://www.recycleguys.org/decals.html>

Recycle Sorting Game:

[https://247scouting.com/web/BSA160/attachment/document\\_14710180570\\_2939.pdf](https://247scouting.com/web/BSA160/attachment/document_14710180570_2939.pdf)

Why recycle infographic: <http://www.recycleguys.org/whyrecycle.html>

Recycle cycle infographic: <http://www.recycleguys.org/recyclingcycle.html>

Local Waste Reduction Programs And Contacts:

<http://www.p2pays.org/localgov/ncwaste.html>

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## Waste Bin Challenge Worksheet

Total weight of my garbage for one week = [calculated in class]

Weight of recyclables = [calculated in class]

Weight of nonrecyclables = [calculated in class]

Total weight of my garbage per day = [calculated in class]

Total weight of class garbage for one week = [calculated in class]

Average amount of waste generated per student per day in our class = [calculated in class]

What did I throw away?	What Material Category Does it belong In? (Paper, Glass, Aluminum, Steel, Plastic)	My Ideas for Using Less, Reusing, or Recycling this Item
Ex. Soda Bottle	Plastic	Throw it in the recycle bin at school

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Trash Timeline Cards:

## Cigarette Butts



## Aluminum Can

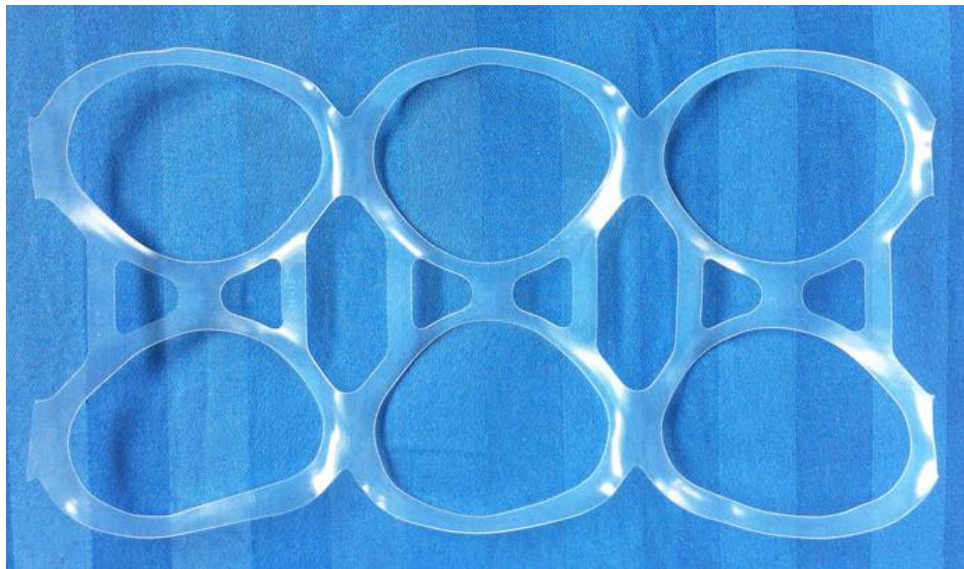




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## Plastic 6-pack rings



## Banana Peel



# Recycle for Nature



## Plastic Bags



## Glass bottles and Jars



# Recycle for Nature



## Plastic coated paper



## Nylon fabric & rope





# Recycle for Nature



## Leather



## Tin cans



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1 to 5 years

1 to 5 years

Up to 2 years

5 years

# Recycle for Nature



10 to 20 years

30 to 40 years

50 years

80 to 100 years

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100 years

1,000,000 years