

Recycling

Grades 4-8 Recycling Lesson Plan



Introduction to recycling:

- Objective: Introduce Recycling and its importance to your classroom.
- Activity: Pass out Recycling One Pager and Definition Sheet.
- Discussion: Open the discussion around recycling. Ask your students who recycles at home and why they believe it is important for their community and the environment to recycle.

Introduce the Glass, Plastic, Aluminum and Paper Recycling sheets:

- Objective: Give your students the glass, aluminum, paper, plastic and biodegradable materials recycling sheets and pass out the Community Recycling Checklist.
- Activity: Ask your students to do research within your community on the access to recycling, recycling facilities and what type of materials are accepted in their towns program.
- Activity: Once the research is complete, ask them to fill out the Community Recycling Checklist with all the information they compiled.

Why is recycling important?

- Objective: Get the conversation started on why it is important for your students to recycle
- Activity: Give them the Recycling Facts Sheet.
- Discussion: Talk them through the Fact Sheet and see how they feel about what they just read. Do you have recycling in your classroom or does the majority of your class recycle at home?
- Activity: Based on their answers and accessibility to recycling, ask your students to write a letter to the principal or their legislators on why it is important for the community to recycle. If you have recycling in your classroom or the class seems to recycle at home, have them write a short essay on why recycling is important. (Sample letters included)

Think about the future:

- Objective: Now that your student is familiar with the recycling cycle, try to identify how they can replace less recyclable items.
- Discussion: Talk to your students about what they use everyday that they can replace with items that are more recyclable.
- Activity: Pass out the "Replace sheet" and ask your students to come up with two examples of something they can replace in their day to day life with a more recyclable item.

What did your class learn?

- Activity: Present the students with the Recycling Quiz to test their knowledge from the lesson

Recycling



Recycling - What it is and why is it important?

Recycling is the process of gathering and changing waste into valuable and reusable materials. Recycling benefits your community and the environment as a whole because it reduces the amount of waste that ends up in landfills, on the streets or in our waterways and oceans. Recyclable waste that ends up in landfills does not disintegrate, but will stay in the landfill for a very long time.

- If glass ends up in a landfill, it will take **one million years to decompose**
- If aluminum ends up in a landfill, it will take between **200-500 years to decompose**
- If plastic ends up in a landfill, it will take **1,000 years to decompose**

The Recycling Cycle:

Do you ever wonder what happens to your plastic water bottle, juice box, soda can or other item when you recycle it? Here's how the recycling process works:



Importance of Recycling:

Recycling helps to reduce the amount of waste that ends up in landfills and also reduces the need for mining and refining of other natural resources such as Bauxite ore which creates substantial air and water pollutants.

Basic Recycling Rules:



Recycle only **CLEAN** bottles, cans, paper and cardboard.



Do not throw loose plastic bags in your recycling bin. These can often be returned to the grocery store to recycle.



Make sure to keep food and liquid out of the recycling bin!



Do not bag recyclables.

Recycling

Glass, Aluminum, and Paper



Glass Recycling

Glass is 100 percent recyclable. Glass does not lose its quality no matter how many times it is broken down and recycled. Glass is made from materials such as sand, soda ash and limestone. Although glass is recyclable, many facilities do not accept it. Here are some common reasons why glass is not as widely recycled.

1. Glass can contaminate other recyclable materials when mixed together, especially if the glass is broken it becomes very difficult to sort.
2. Glass can be hazardous to recycling workers and it can also damage the recycling machines.
3. Glass is heavy and expensive to transport. Glass has been replaced with aluminum and plastic, both of which are both lighter, easier to transport and recycle.

Aluminum Recycling

Aluminum is 100 percent recyclable. Aluminum does not lose its quality no matter how many times it is recycled. Aluminum is a lightweight and durable material made from mining Bauxite Ore. Bauxite is a metal found in the earth's crust, but Aluminum is not a metal in its natural state. Bauxite must first be mined and then chemically refined. Mining Bauxite can cause harm to the environment and communities around it. When mining for this material it is removed from the ground, which causes negative impacts to the wildlife, vegetation and soil in the surrounding areas. Aluminum is used to make cans for soda, other beverages, and canned food products. Recycling this material is extremely important because it can take between 200 and 500 years for an aluminum can to decompose in a landfill. When you recycle a can, it can be turned into another new can.

Recycling

Glass, Aluminum, and Paper



Paper Recycling

Paper products are made from a material called pulp, most of today's paper is made from wood pulp. To make wood pulp, a tree needs to be cut down. Once the tree is cut down and turned into wood chips, there are three ways it can be turned into pulp. Through a chemical process, a mechanical process or through a recovered paper pulp process. Recovered paper pulp is pulp created from paper that has been recycled. Recycling your paper helps to lower the amount of trees that are cut down each year. Paper is not something that can be recycled over and over again, like plastic and aluminum. After paper is recycled 5-7 times, the pulp fibers become too small to reuse.

Here are some different types of recyclable paper:

Paper: All computer paper and colored paper that you use at home and at school can be recycled. Your notebooks can also be recycled. If your notebook has a metal spine, it might need to be removed first.

Newspaper: All newspapers should be recycled. The recycling facilities will break this material down and reuse it to make new newspapers or other paper products.

Boxes and Cardboard: Cereal boxes, shoe boxes, and other paper based containers can be recycled. Just be sure to remove any contents before placing them in the bin. Cardboard boxes should be broken down and recycled. After you enjoy a pizza, be sure to cut away any areas that have grease or cheese stuck to them. Once these areas are removed, the cardboard pizza box can be recycled.

Sticky Notes: Some facilities have the ability to remove the sticky part off the paper, so you can recycle these as you would with normal paper products. Just check with your local recycling company to be sure!

Mail: Paper mailings and envelopes can be recycled. Even those with a plastic lining or window should be recycled.

Paper Bags: Paper bags used to carry groceries should be recycled.

Can you think of any other paper products that can be recycled?

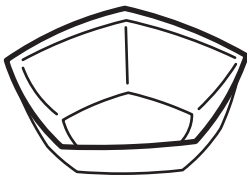


“Biodegradable” Materials



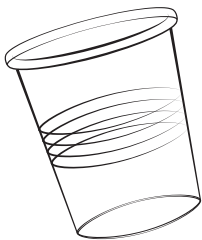
Glass, aluminum, plastic, and paper are all common, recyclable materials. A newer class of material is designed to be biodegradable. This means that it will break down and decompose over time. This may be a very long time; people are surprised to learn that “biodegradable” materials may take years to break down!

Below are some examples of newer materials. The first two are not recyclable and will contaminate the recycling stream. They should be thrown away.



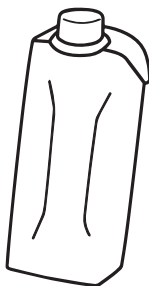
“Compostable” Paper/Fiber Bowls

Fiber alternatives, typically used as take-out food bowls, are often marketed as compostable. But not many people have access to composting, so the majority of these containers end up in landfills, adding to the problem. These cannot be recycled and can cause problems for recycling centers if disposed of incorrectly.



Corn-based plastics (I.e. plastic cups)

Poly-lactic acid (PLA) food and beverage containers are made from corn, sugar cane, or other plants. Labels often state they are compostable (meaning they return to the earth in a safe way), but this is only the case if it decomposes in a special facility, which is not available in many parts of the country. If placed in the recycling bin, it can cause problems, like the fiber containers.



Cartons

Some mistakenly think paper-based cartons will biodegrade. They won't—they are a mix of paper and plastic or metal lining. This also makes cartons difficult to recycle. While some recycling centers have begun to accept cartons, it is not as common as other materials. Contact your local recycling company to check if your curbside program collects cartons.

Community Recycling Research Checklist:



Recycling Facility:	
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Materials They Accept:					Additional Information:
Glass?	Plastics?	Aluminum?	Paper?	Biodegradable?	

Recycling Facility:	
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Materials They Accept:					Additional Information:
Glass?	Plastics?	Aluminum?	Paper?	Biodegradable?	

Recycling Facility:	
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Materials They Accept:					Additional Information:
Glass?	Plastics?	Aluminum?	Paper?	Biodegradable?	

Types of Plastics



Below you will find the various types of plastics, what they are commonly used for and how they are recycled.



PET

(Polyethylene Terephthalate)

#1 PET is the most common plastic used for most single-use bottled beverages, like bottled water or soda. PET bottles are inexpensive to manufacture, they are lightweight and they are the easiest to recycle. Even though they are the easiest to recycle only about 29% of PET plastics are recycled in the US.

What are common PET plastics? The most common type of PET plastics are soft drink bottles, water bottles, cooking oil containers, salad dressing containers and many household cleaning products.

How can you recycle PET plastic? PET plastics are picked up in most curbside recycling programs as long as the items are empty and clean!

PET Plastics can be recycled into many different items such as clothing, carpets, bags and other bottles and containers.

#2 HDPE, or high density polyethylene, is a higher dense plastic that is very versatile and sturdy. This type of plastic will not break down as easily if exposed to sunlight or extreme temperatures. Only between 31% of HDPE plastic is recycled in the U.S.



HDPE

(High Density Polyethylene)

What are common HDPE plastics? The most common types of HDPE plastics are milk jugs, juice bottles, bleach and detergent bottles, lotion and shampoo bottles, butter tubs.

How can you recycle HDPE plastic? HDPE plastics are picked up in most curbside recycling programs, as long as the items are empty and clean! However, grocery bags and plastic wrap are not accepted in most curbside bins. Check with your local grocery stores, some will collect these items and recycle them for you.

HDPE Plastics many times can be recycled back into their original forms, such as another laundry detergent bottle, floor tiles, benches, picnic tables and many other things.

Types of Plastics



PVC

(Polyvinyl Chloride)

#3 PVC, or polyvinyl chloride, is an extremely strong and reusable form of plastic. PVC comes in two forms, rigid and flexible. Rigid PVC is commonly used in construction such as pipes, and flexible PVC is commonly used as food covering sheets. You would need to ask your local collection center if they accept this type of plastic.

What are common PVC plastics? The most common types of PVC plastics are pipes, shampoo bottles and other types of thicker plastic bottles, windows and house siding.

How can you recycle PVC plastic? PVC plastic must be recycled properly because it can have harmful chemicals like Chloride in it, which can be released if the items are burned.

PVC Plastics are often made into very sturdy items such as decks, paneling and flooring.



LDPE

(Low Density Polyethylene)

#4 LDPE, or low density polyethylene, is an extremely flexible form of plastic.

What are common LDPE plastics? The most common types of LDPE plastics are squeezable bottles, frozen food bags, dry cleaning plastic bags.

How can you recycle LDPE plastic? LDPE plastic is not often accepted in curbside recycling programs. To recycle this material, check with your local recycling program to see if there is a drop off place that collects these items. This is similar when you want to recycle plastic bags, which can often be brought back to your local grocery store.

LDPE Plastics are often recycled into trash can liners, shipping envelopes, paneling and floor tile.

Types of Plastics



#5 PP, or polypropylene, has an extremely high melting point, which is why this type of plastic is chosen to hold hot liquids or can be used to heat food in the microwave.



PP

(Polypropylene)

What are common PP plastics? The most common types of PP plastics are yogurt containers, caps, food containers, and straws.

How can you recycle PP plastic? PP plastic can be recycled through curbside recycling, however, you need to make sure the items are CLEAN before putting them into the recycling bin.

PP Plastics are often recycled into brooms, brushes, ice scrapers, bicycle racks, and traffic lights.

#6 Polystyrene can be made into rigid or foam products. It is also known as Styrofoam. Most recycling programs do not accept PS plastic. Check to see if your recycling company does!



PS

(Polystyrene)

What are common PS plastics? The most common types of PS plastics are disposable plates and cups, egg cartons, meat trays and carry out containers.

How can you recycle PS plastic? PS plastics are not widely accepted into recycling facilities. Many products have switched from PS plastics to PET plastics because of the ease of recyclability.

PS Plastics are often recycled into other carry out containers, egg cartons, and light switch plates.

#7 is classified as “Other” a large variety of plastics do not fit into the other categories, so they created a miscellaneous category. #7 plastics are typically made into plastic lumber. Some examples of these plastics are bullet proof material, DVD’s and nylon.



Other

Recycling Facts Sheet



Below you will find some recycling facts! Go through the list and talk about each of these and see which are the most shocking to you!

1. The U.S. Recycling Rate is **only 35%**! That means 65% of Americans are NOT recycling.
2. Plastic Recycling is available to **87% of Americans**. With such a great access to recycling, there is no reason why we shouldn't be recycling more.
3. The recycling rate for plastic is **ONLY 8%**. Recycled plastic can be made into many other materials, such as shirts, bags, play toys and park benches.
4. Recycling plastic requires **88% less energy** than creating it from its raw materials like coal, natural gas and crude oil. Creating new plastic is worse for the environment than recycling your used plastics.
5. Styrofoam (or #6 Polystyrene) **never** decomposes. It is calculated that Americans throw away **25 BILLION** Styrofoam coffee cups every year! These cups end up in landfills and stay there forever.
6. One ton of recycled plastic saves:
 - a. 5,774 kWh of electricity, equivalent to watching your TV for two years straight.
 - b. 685 gallons of oil, enough to fuel the average American's car for about half a year
 - c. 98 million BTUs of energy – enough to provide electricity to the average US household for nearly 3 years
 - d. 30 cubic yards of landfill space.
7. Only 2% of mismanaged ocean waste comes from the U.S.
8. More than **28 BILLION** glass bottles and jars end up in landfills around the country every year. This is a wasted opportunity, because glass is 100 percent recyclable.
9. Recycling ONE glass bottle can conserve enough energy to power a 100-watt light bulb for up to FOUR hours!
10. On average Americans use **85 million tons** of paper per year! That averages out to about 680 pounds per person.
11. Recycling cardboard only takes **75% of the energy** required to make new cardboard. Making new cardboard is worse for the environment than just recycling your old cardboard.
12. By recycling just **ONE** aluminum can you can save enough energy to power your television for up to THREE hours!
13. Each year in the U.S., approximately **1 BILLION** trees worth of paper are thrown away in the trash, leaving huge room for paper recycling improvements.
14. The Great Pacific Garbage Patch is a mass of plastic waste located between Hawaii and California. The mass isn't solid but it covers a **one-million-square-mile spot in the ocean**.
15. American throw enough trash away in one year to circle the earth **24 times**! By getting smart about our waste and improving our recycling, we can all help to make a positive impact in our environment.

Template Letter to your Legislator:

[Date]

The Honorable [First Name] [Last Name]

[Room Number], State Capitol

[City], [State] [Zip]

RE: [The reason you are writing this letter]

Dear [Assembly Member/ Senator] [Last Name],

My name is [insert your name] and I am a student at [insert school name]. I am writing to you to talk about recycling and how important it is for our community and our environment.

[Tell your representative why recycling is important to you and how it affects you, your community and the environment as a whole.]

Sincerely,

[Name]

Template Letter to your Principal:

[Date]

RE: [The reason you are writing this letter]

Dear [Principal Name],

My name is [insert your name] and I am a student at your school. I am writing to you to talk about recycling and how important it is for our community and our environment.

[Tell your principal why recycling is important to you and how it affects you and your school. If you do not have recycling bins in your classroom, ask your principal to work to get recycling bins.]

Sincerely,

[Name]

Replace



Directions: Come up with two examples of non-recyclable items that can be replaced with items you can recycle.

Example: Styrofoam egg containers could be replaced with clear plastic or paper holders.

Recycling Quiz



Fill in the blanks:

Glass	Bauxite	Paper	Plastic	Recycling	Landfill
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1. A _____ is the oldest form of waste management.
2. It takes _____ between 2-6 weeks to decompose in a landfill.
3. _____ Ore is the mineral that you mine in order to make aluminum.
4. _____ is the act of changing waste into reusable materials.
5. Bottles and Jars made of _____ once cleaned are acceptable to be put into the recycling bin.
6. PET is the most recyclable form of _____.

True / False: Circle the correct answer.

7. The recycling rate in the United States is over 50%. True / False
8. Plastic Bags are able to be recycled in a normal recycling bin. True / False
9. If everyone recycled just two plastic bottles a week we would be able to cut down on the amount of plastic pollution that ends up in landfills. True / False
10. Most of the plastic pollution that ends up in the oceans come from the United States. True / False
11. Water boxes and juice boxes are great eco-friendly alternatives to plastic. True / False
12. The U.S. is a leader in the recycling field. True / False
13. To-go cups and take out food containers made of Styrofoam are easily recyclable. True / False
14. Recycling certain materials saves much more energy than it takes to create new products. True / False

Short Answer:

Describe in your own words what recycling is and why it is important to recycle and educate others about recycling.

Recycling Quiz



Answer Key:

1. Landfill
2. Paper
3. Bauxite
4. Recycling
5. Glass
6. Plastic
7. False, the recycling rate is acutely much lower, it is around 35.2%.
8. False, plastic bags are not recyclable in a normal recycling bin. They can clog the recycling machines which causes problems at the recycling facility.
9. True, even if we recycled just two plastic bottles a week, we would be able to reduce the amount of recyclable plastic that ends up in landfills.
10. False, 90% of ocean plastic pollution comes from Africa and Asia.
11. False, These boxed products are made from a combination of plastic, cardboard and small amounts of aluminum and most recycling facilities in the U.S. cannot process this type of material.
12. False, The U.S. recycling rate is fairly low compared to the rest of the world. There are various factors Some countries in the E.U. like Germany, Switzerland and Austria have recycling rates of at least 50%. In order to increase recycling rates in the U.S. we need better recycling efforts and education efforts.
13. False, Styrofoam is not widely accepted in curbside recycling and if it ends up on a landfill it will never decompose.
14. True, if we recycle already manufactured products we are able to save much more energy then we would if we were to create new materials. According to the EPA's Individual Waste Reduction Model, if you recycle just 10 plastic bottles you save enough energy to power a laptop for 25.4 hours.