

Today I Learned About Recycling

“So bottom line? Yes, recycling can make a dent on climate change. ...To see those benefits, we’ll need bigger changes to how products are designed—and we might want to look at how much waste we’re creating in the first place.

Laur Hesse Fisher, Host, TILclimate, MIT Environmental Solutions Initiative
TILclimate podcast: Today I Learned About Recycling

Collecting Recycling Problems and Solutions

Most of us are familiar with recycling as an ‘environmentally friendly’ or ‘eco-friendly’ action. There are problems with recycling -- but also solutions to improve how much waste gets recycled.

As you listen to the podcast episode, write down the problems and solutions that you hear. Then, add a few that you have heard about or experienced. Then, work with your group to answer the questions on the next page.

Recycling Problems

Recycling Solutions

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Recycling: Problems and Solutions

1. Share the problems and solutions that each member of your group wrote down.

What patterns do you notice in the problems and solutions you've identified?

2. Find the simplified hierarchy from the Zero Waste International Alliance on page 3. Read through the level descriptions and discuss with your group until you all agree on what each level means.
3. Sort your group's list of Solutions into the levels of the hierarchy.

Are more of your solutions at the lower end or the higher end of the hierarchy? Why do you think this is?

4. Find the descriptions of the three categories of solution on page 4. Read through the descriptions and examples and discuss with your group until you all agree on what each category means.
5. Sort your group's list of Solutions into the categories.

Which category has the most solutions? Why do you think this is?

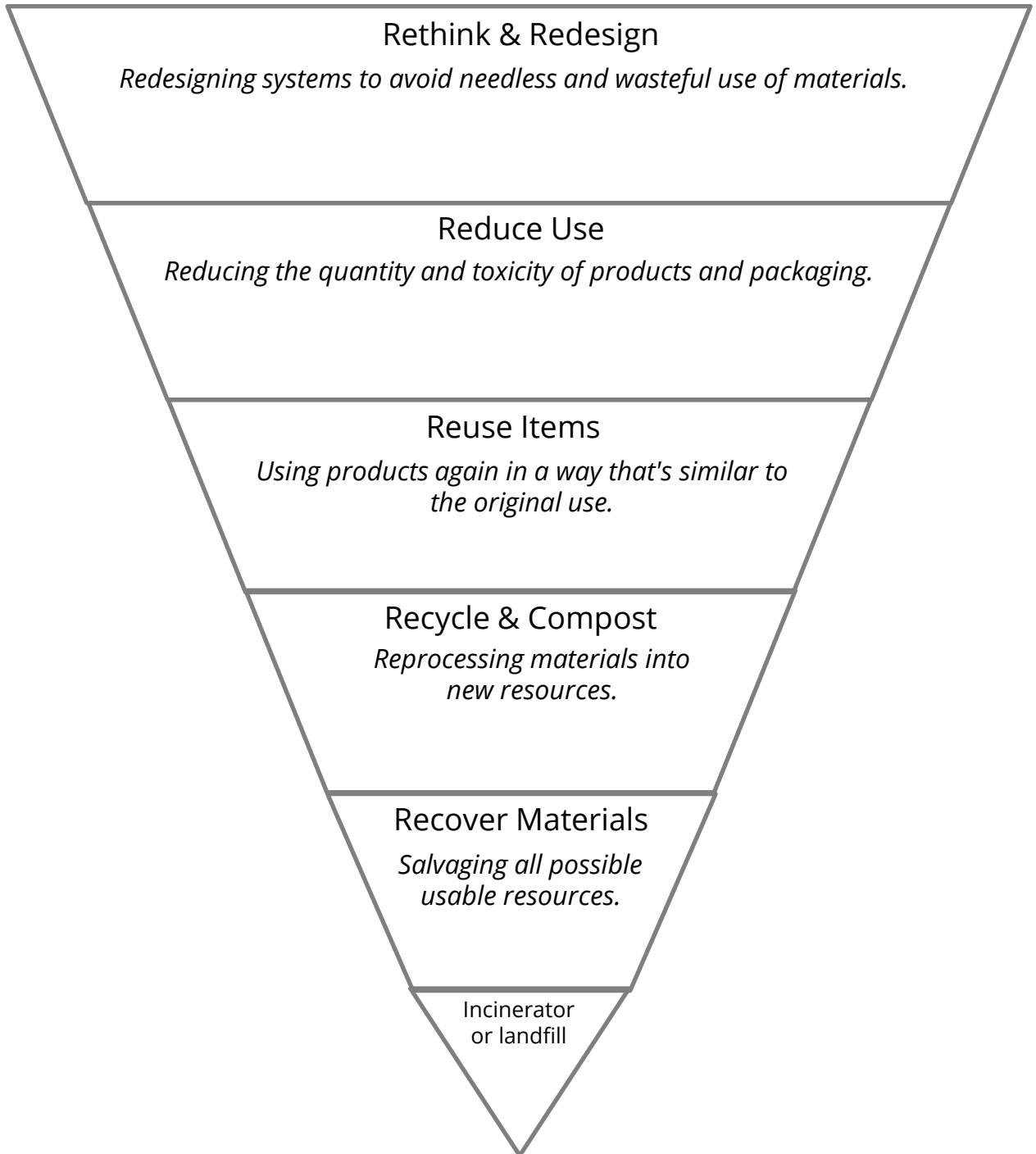
6. Consider your list of Problems. Create your own categories to sort the problems.

What categories did you create? Why did you place the problems in these categories?

7. In your group, discuss:
 - Do you think solutions at the top or bottom of the hierarchy are more effective? Why?
 - Which categories of solutions do you think are the most effective?
 - Take one solution that is low on the hierarchy and discuss how you could change the solution to move it up to a higher level.

TIL About Recycling: Zero Waste Hierarchy

The Zero Waste International Alliance created and updated a multi-level hierarchy (pyramid) of ways that we create, use, and dispose of materials in our lives. A simplified version of this pyramid is below.



Simplified Zero Waste Hierarchy based on The Zero Waste Hierarchy 8.0 <https://zwia.org/zwh/>

TIL About Recycling: Categories of Solutions

Recycling solutions often fall into three major categories, though there can be overlap among them. Not all problems can be solved in all three ways, and many problems require solutions in all three categories.

Example Problem: Food packaging ends up in the trash.

Category 1: Behavior Change Solutions

How could people acting differently solve your problem? What strategies could make them shift their behavior?

(Tip: Make your solution easier or cheaper than what they're doing now.)



Example Behavioral Solution: A restaurant chain makes takeout containers that can be brought back for a discount on your next order. They clean and reuse the containers.

Category 2: Technological or Design Solutions

How could a new technology - or a redesign of a part of the system - reduce your problem?



Example Design Solution: A lot of food packaging is currently made of materials that cannot be recycled. Redesign food packaging so that it is easier to recycle or reuse.

Category 3: Systemic or Policy Solutions

How can laws, policies, or incentives help shift behavior or technology?



Example Policy Solution: Companies that make food packaging are required to take back and recycle, reuse, or repurpose that packaging.

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Practice: Sorting Solutions

Solutions to recycling problems can come in many shapes and sizes. Use the Zero Waste Hierarchy (p. 3) and the Solutions Categories (p. 4) to complete the following practice.

Example problem: The school trash is filled with plastic water and soda bottles.
Draw lines to connect each proposed solution to its place in the hierarchy.
Using the definitions on the next page, draw lines to show which solutions are behavioral, technological, or policy. (Some may fit more than one category.)



Rethink &
Redesign

Art or science project reusing
thrown-out water bottles.

Behavior
Change
Solution

Reduce
Use

Poster or social campaign to
encourage people to bring in their own
reusable water bottles from home.

Reuse
Items

Design a machine to sort the trash
to find and recycle plastic bottles.

Technology or
Design
Solution

Recycle &
Compost

Put more recycle bins around the school.
Make sure there are plenty of places to
refill water bottles with good-tasting water.

Policy or
Systemic
Solution

Recover
Materials

Ban the sale of plastic bottles at school.
Poster or social campaign to
encourage people to recycle more.

Which solution(s) do you think would be most effective?
What other solutions can you think of?

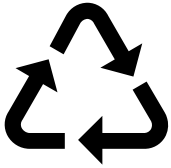
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"I think it's important when we talk recycling - especially when we also talk design - if we can design for reuse solutions, that's of course better than going straight to recycling."

Anders Damgaard, Technical University of Denmark

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Beyond the 3 Rs



Many of us are familiar with the "Three Rs": Reduce, Reuse, Recycle. But there's a more effective way to reduce trash and waste: by looking at the ways that design, systems, and incentives affect how we create, use and dispose of materials. This gives us access to solutions that are more impactful than just "recycling more".

Solutions Are All Around Us

Your group is going to use a design process to research, design and share a solution to a recycling problem. Your solution may be technological, systemic, behavioral, or something entirely new. Through this process, you will:



Identify a problem



Brainstorm solutions



Select an idea



Design a model, prototype, or draft



Share your solution

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Identify a Problem

1. In your group, compare and discuss the problems and solutions you have collected.
2. Pick one problem that you want to focus on for your group project.
 - Which problem(s) have you experienced in your own life?
 - Which problem(s) have you heard about by word of mouth, in the news, or on social media?



Brainstorm Solutions

3. In your group, brainstorm solutions for your chosen problem. Use the Zero Waste Hierarchy (p. 3) and Categories of Solutions (p. 4) to help.
 - How can your problem be seen from other angles?
 - Are there solutions that fit in all levels of the hierarchy?
 - Are there solutions that fit in all three categories?



Select an Idea

4. Sort your solutions according to the Zero Waste Hierarchy.
5. Decide which category of solution you are most interested in pursuing.
6. As a group, choose a solution to focus on.
 - Remember that solutions higher on the hierarchy will have the largest impacts.

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Design Your Solution

7. What does your solution look like? How would you convince others to adopt it? Design a way to share your solution with others.

Depending on the category and type of solution you chose, this could be:

- a *prototype* (for example: board game designers make prototypes that are hand-drawn on cardboard or printed after having been designed using stock images)
- a *model* or *mockup* (for example: a general sense of what your art piece would look like)
- a *draft* (for example: a document describing a proposed policy change)
- or something else.



Share Your Solution

Solutions work best when the right people are excited about them. Design a communication plan for sharing your solution with the most influential audience.

8. Who has the power to decide to use your solution? This is your audience.
9. What are the interests and attention span of your audience?
 - Why would your audience be excited about your solution?
 - What information would they need to get excited about your solution?
10. How would your audience most want to receive the information about your solution?
 - If your audience is a policymaker, would they want to see a petition from the community? A business plan? A draft policy?
 - If your audience is your neighbors, would they want a video? A poster? A demonstration of a prototype?
 - What skills does your group have that could be used? Consider writing, music, art, podcasts, videos, lessons, etc.

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“For pretty much any material the recyclable materials are much cheaper to reprocess than the virgin materials. And this is the main reason why we do recycling.”

Anders Damgaard, Technical University of Denmark

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Where Does Your Recycling Go?

Recycle bins are common in many places. You may see one or more in your classroom, cafeteria, home, library, shops, etc. But where does all that recycling go? There is no centralized recycling system in the US, so the answer is different for each of these places.

Choose one place in your daily life that offers recycling.

Location:

1. What kind of place is this?
2. Who could you ask to find out where that recycling goes?
3. Ask that person. Do they know? Try to get the name of a company or service.
4. If they do not know, who else can you ask (building supervisor, town administrator, store manager)?
5. Once you get the name of a company or service, visit their website.
6. From the website, try to learn the following:
 - a. Where does the recycling go? (How far away?)
 - b. How is it sorted?
 - c. Where do the sorted materials go?
 - d. Do they have any special rules about what can and cannot be recycled?
 - e. What else did you find that was interesting or surprising?
7. Compare with a partner. What did they learn about their place? What surprises you?

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“We have to relearn [for] ourselves, that any material actually has a value. And we had to appreciate that both from a fiscal point of view, but also from an environmental point of view.”

Anders Damgaard, Technical University of Denmark

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Investigate: US Municipal Solid Waste

The US Environmental Protection Agency (EPA) has been collecting data on trash and recycling since the 1960s. What we generally call “trash”, the things we throw out or recycle from our homes, schools, and stores, is called *Municipal Solid Waste* (MSW). This does not include construction debris or industrial waste.

The issues around how we create and manage MSW are complex, and you probably still have questions. You can use EPA data to answer some of those questions.

Brainstorm Questions

With your group, brainstorm questions you still have about recycling and trash. Depending on how much time you have, you may go for relatively straightforward questions such as “What percent of x material gets recycled each year?” or more complex ones like “Which material has had the fastest growth in recycling since 1990?”

The EPA reports the following kinds of data. Use this list to help you decide which question(s) to investigate.

- Generation: What kinds of materials are we throwing away or recycling?
- Recycling: Of those materials, which ones get recycled the most?
- Composting: What materials are getting composted?
- Combustion with Energy Recovery: What materials are going to incinerators?
- Landfilling: What materials are going to landfills (dumps)?
- Trends: For all these questions, how have the numbers changed over time?

Investigate Answers

Visit <https://climate.mit.edu/ed/mswfacts>¹

Use the clickable table of contents at the top of the page to jump to the section that will best answer your question.

¹ <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials>