

# Waste Audit

“We don’t need a handful of people doing zero waste perfectly. We need millions of people doing it imperfectly.”  
–Anne Marie Bonneau

## Background Information:

### Bin Information

This lesson is the third in a series of lessons on waste management. In the first lesson, students are introduced the 3R’s of waste management; reduce, reuse, recycle, with a series of activities for each one. In the second lesson, students learn how different waste has impacts that are visible and impacts that are invisible in the production of greenhouse gasses. In this lesson, students will perform waste audits for what they produce in their own lives and evaluate ways that they can reduce the waste.

### Information for Instructors

Waste audits are used by companies and organizations to learn more about the waste that they are generating in order to gather the information that they need to make decisions in order to reduce waste and recycle better. Waste audits are also helpful for finding things that are being incorrectly put in recycling or compost but do not belong there. Larger organizations may choose to do a waste audit to save money on disposal, change purchasing habits, or improve their environmental image. Waste audits can also be utilized for the same purposes on a smaller scale as in this lesson to give students a better understanding of their own habits.

## Materials and Set-Up:

This kit includes:

- Tarps for sorting waste
- Scale
- Rubber gloves
- Labels for trash, recycling, and compost bins

You will need:

- Access to accumulated trash
- Extra bags for sorted trash
- Clipboards
- Aprons (optional)
- Goggles (optional)

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### Themes:

Social Action, Waste Audit, Waste Reduction, Trash, Reduce, Reuse, Recycle

### Estimated Duration:

Up to 3 hours active time

Takes place over one week

### Audience Identified:

6<sup>th</sup>-12<sup>th</sup> grade

### Location:

Location to sort waste, outdoors may be preferable

Classroom or equivalent

### Goal:

Students will evaluate their waste production and take steps to reduce the landfill waste that they produce.

### Objectives:

Students will have a better picture for the way that they generate waste in their own life.

Students will create a plan for waste reduction in their own life.

Students will describe what happens to items after they are thrown in either the trash, recycling, or compost.

Set-Up:

- This lesson takes place over a period of time to allow for the accumulation of waste. Before this lesson begins, choose where you will be doing the waste audit and waste reduction activities (for example, a classroom trash can) and make arrangements for that waste to not be picked up for an appropriate amount of time. For a classroom trash can this may be a week, for a cafeteria audit, it may be one day.
- Set up two tables and cover with tarps

## Introduction:

Estimated Duration: 10 minutes

### Warm Up:

On scratch paper, or with a partner, have students write down anything that they have thrown out that day. If the lesson takes place early in the morning, have them write down things that they threw away the previous day. After a few minutes of thinking, have them share a couple of things with a partner.

Ask students how much waste in pounds that they think they produced the previous day, and then how much they produce on an average day, taking into account larger items, that are tossed less frequently. On the whiteboard draw a line, and have students come up to the board and draw a tick mark and label how much waste in terms of pounds that they think the average US citizen produces.

When everyone is finished, share the actual numbers generated in 2017:

- 267.8 million tons of municipal solid waste
  - 67 million tons recycled
  - 27 million tons composted
  - 173 million tons landfill
- or 4.51 pounds per person per day

Today students will be taking a closer look at the waste that they produce.

## Content and Methods:

### Waste Audit

Estimated Duration: 45-90 minutes, varies on number of students and amount of waste

- To conduct the waste audit, divide students into teams.
  - A sorting team who will sort all the trash into categories. These can be changed to suit your group's needs, but a good place to start is mixed paper and cardboard, plastics, metals, glass, food scraps and food-soiled paper, and landfill. This is the majority of the class.
  - A bin monitor team. These students will be appointed experts who will help with quality control, double check the sorting team's work, and answer questions. Assign one student per category to be an expert for that area.
  - The weighing team. These students will weigh all of the sorted trash and then record all of the data. Assign three students to this group.

- Go over the roles with students and explain what their tasks will be and an overview of the process; students will work assembly line style to sort the trash, then weigh the piles, and record the data.
- Take some time before beginning to go over some items that can or cannot be recycled. Look up information specific for your collection group if you are unsure. Talk broadly about different types of recycling, and then allow students to ask questions about anything that they are unsure of and work together to find out the answer if you do not know. You may also wish to provide the bin monitor team with resources to double check any uncertain items.
- Once students are ready, hand out the appropriate protective gear, such as gloves, and put the trash on the tables. It's best to open bags and pour out the trash so that students do not have to reach in bags.
- Have all of the sorting students gather around the table and begin sorting out into different piles. When the piles are large enough to fill a bin, they can be checked by a Bin Monitor and taken to the Weighing team. Make sure that the weighing team subtracts the weight of the bins from the total.
- Spray down the tarps, bins, and clean all protective equipment. Have all students wash their hands.
- When all of the waste has been sorted, discuss the results as a group, particularly if there was anything that surprised them. Some specific questions that can be asked to guide conversation include
  - How much of what was thrown away could have been recycled or composted?
  - Was there anything that was thrown that seemed like a waste? What could have been continued to be used?
  - Did the total amount of garbage surprise you? Was it more or less than you thought it would be?

## Waste Reduction:

Estimated Duration: 60 minutes active, over a set period of time

- After conducting the waste audit, students will have a baseline for reducing the amount of waste that they produce. Look at the waste that was recorded and for what length of time it was produced over. Tell students that they will be saving their waste over the same period of time and judging it against this amount.
- Work together as a class to choose a percentage point that they would like to reduce their waste by and use that number and the totals from the waste audit to determine the max amount of waste that each student could produce per day and still stay under the goal.
- Set up labeled bins in the classroom for recycling, compost, and landfill. For the duration of the week, all of the waste that students produce will be kept and sorted into the bins to prepare for another waste audit.
  - For compost, you may choose to record and dispose of along the way to avoid flies or smells.
- At the end of the time, perform another waste audit. Go through the recycling and compost and remove any items that were placed there but shouldn't have been. Weigh those, double it, and add it to the total for landfill waste.
- Record the totals for landfill waste, recycling, and compost. Clean up and gather to discuss.

## Conclusion:

Estimated Duration: 10 minutes

Discuss as a class the following questions:

- Was the goal that you set as a class reached? Was it easier or harder than expected?
  - Do you think that you would be able to go for the same period of time and send no waste to the landfill? What would be the hardest change?
- Did students notice themselves changing any behaviors over the course of the week to avoid producing waste, or changing what they did to dispose of it?
- Did keeping waste with them for the duration change the way that they viewed throwing something out?
- What is something that they would like to take with them that they learned from this?

## Reflection and Evaluation:

Estimated Duration: 10 minutes

### Reflection

After the class discussion, have students examine the waste management hierarchy from the EPA and note where their behaviors fell on the chart. Did they work more on changing behaviors to result in less waste, or change the ways that they disposed of the waste after it was generated? If the extension Where does it go? is being used, students can also evaluate if their trash goes through energy recovery or not. Reflection can take place either as a group conversation or individual written reflection.

### Evaluation

Evaluation for this lesson takes place during the conclusion and reflection. Students will be considered successful if they are able to meet their waste reduction goal or answer critically about why they were not able to meet it, if they can successfully identify during the audits whether items belong in the trash, recycling or compost, and if they share thoughtful answers during the conclusion.

## Extensions:

### Accessibility and Accommodation:

**Distance Learning:** If students are learning from home, this lesson could still be taught by having students perform a personal waste audit at home for the trash that they are personally producing. For 48 hours, or another timeframe as set by the instructor, everything that they should collect all of their waste that they would have thrown in the trash in a plastic bag or appropriate container (with the



exception of any bathroom waste) and measure at the end. It is up to the instructor to decide if they should include things that they are also allowed to recycle or compost items. After examining this at the end, they can record the results to turn in, along with a goal for improvement, for example, to cut down on the total amount of waste generated by a certain percentage or to cut out a certain item. Then they should repeat the exercise over the next 48 hours and see if they meet their goal.

**High Sensory:** Even if wearing gloves, the smell and feel of sorting through trash may be too much for some students. There are several possible options for this, though the students may require different accommodation or exemption from the main part of this activity. One option during a classroom audit is to have the student take on the role of a photographer or journalist and take notes and/or pictures of what the other students are doing during the audit to share later. During a personal audit, instead of physically keeping all of the trash, it may be a better option to have students keep a running list of every item that they throw out.

### Where does it go?

For an extension of this activity, students can take a closer look at what happens to their waste after it is thrown 'away.' Divide the students into groups, and have them each spend a short amount of time researching what happens after something is tossed in recycling, trash, or compost, or what to do with other specific items. The answers should be as specific as possible for the community that the students are in. For Lakeville, a great place to start is <https://www.dakotavalleyrecycling.org/> After researching, the groups can take turns reporting their findings to the class.

### Recycling Audit

As an extension, students can also conduct a recycling audit. The process is the same, except students will be specifically looking for items that have been 'wish-cycled' or tossed in the recycling even though they belong somewhere else to get a sense of the purity rate of their recycling.

### Field Trips

Field trips can be scheduled for several different Materials Recovery Facilities in the Lakeville area to give students a hands on and personal look at what happened to the curbside recycling that they put out, including Recycle MN (Dick's Sanitation), Republic Services, and Dem-Con. If you are interested in scheduling a tour, more information can be found here: <https://www.dakotavalleyrecycling.org/field-trips>

### Reference Materials:

EarthTeam Environmental Network. *How to Run a Waste Audit*. Retrieved from <https://protect-us.mimecast.com/s/0rszCDk2GZs3N5MCWn3dH?domain=hamiltoncountyrecycles.org>

National Overview: Facts and Figures on Materials, Wastes and Recycling. (2020, March 13). Retrieved from <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials>