

Waste Audit

Key Topics: Decomposition, Recyclable, Compostable, Non-Compostable, Biodegradable, Waste, Landfills.

Grade Levels: 3-6

[Click here for Series #7 Description](#)



Lesson Bridge:

Introduce this series by mentioning how some waste items break down naturally and return nutrients to the earth while others take a very long time to break down and can even be toxic. Prep students for Lesson #2 (*Cool Carbon Sink*) in this series by describing how decomposable organic materials help to remove carbon from our atmosphere and lock it into the earth where it can be used by plants and animals.

Lesson Overview:

Students will learn about the impact of school waste on the environment. They will use math to measure some/all of the waste produced in one day on campus, and brainstorm ways to reduce that waste. Additionally, teachers can expand on this lesson by encouraging students to take on leadership roles to organize a campus-wide Waste Audit to collect more data and design and implement solutions for reducing waste on campus (see extensions below for more details).

Suggested Activities and Learning Objectives by Grade Level:

- **K: K-ESS-3** Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.*[Clarification Statement: Examples of human impact on the land could include cutting trees to produce paper and using resources to produce bottles. Examples of solutions could include reusing paper and recycling cans and bottles.]
- **3: 3-LS4-4** Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.*

[Clarification Statement: Examples of environmental changes could include changes in land characteristics, water distribution, temperature, food, and other organisms.]

- **LS4.D:** Biodiversity and Humans Populations live in a variety of habitats, and change in those habitats affects the organisms living there. (3-LS4-4)
- **5: 5-ESS3-1** Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources and environment.
- **MS: MS-ESS-4** Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth’s systems.

[Clarification Statement: Examples of evidence include grade-appropriate databases on human populations and the rates of consumption of food and natural resources (such as freshwater, mineral, and energy). Examples of impacts can include changes to the appearance, composition, and structure of Earth’s systems as well as the rates at which they change. The consequences of increases in human populations and consumption of natural resources are described by science, but science does not make the decisions for the actions society takes.]

Essential Question(s) that Connect CCCs and SEPs:

- What do you think makes up most of the waste that ends up in the school’s dumpster? How can we figure out if your guess is correct? ([Planning and Carrying out Investigations](#))
- How does what I observe about school waste change at different scales? Does the impact of one student’s waste have more or less of an impact on the environment, than the waste of the entire school? Can I think of examples of what I am seeing as bigger or smaller? ([Scale](#); [Asking Questions & Defining Problems](#)).
- How can we figure out what the weight of all of the waste produced in one school day is? If we weigh a student holding a bucket of waste, what do we need to subtract from that number to know the weight of the waste only. ([Using Math & Computational Thinking](#)).
- What were the categories that had the most waste? ([Analyzing and Interpreting data](#); [Patterns](#)).

Vocabulary:

Decomposition- To be broken down into simpler parts

Recyclable- When something can be regained or reused

Compostable- Waste that can be turned into useable material(soil)

Non-Compostable- Something that is not capable of breaking down by decomposition

Biodegradable- Something that is able to be broken down by living organisms by decomposition

Waste- unwanted or unusable materials

Landfills- A place where everybody’s waste is collected and kept

Materials:

- One large tarp or three smaller tarps for sorting
- Scale(s) large enough for students to stand on
- Three waste receptacles for sorting. It is important that kids are able to pick these up and hold them on a scale (small trash cans, 10-gallon buckets, trash bags, etc.)
- Labels for three different types of waste (handwritten labels on recycled paper work great!)
 - Landfill**

- Recyclables**
- Compost/Green Waste**
- If you are eager to create sub-categories within these three categories to gain a better understanding of what types of waste you have, refer to these label ideas:
 - Recyclable Plastics (#1 and #2), Glass, Cardboard/Paper, Compostable Food Waste (Fruits and Veggies), Cartons (Juice, Milk), Wrappers, Non-Compostable Food Waste (NOT Fruits and Veggies - Meat, Dairy, Bread, etc.), Non-recyclable Plastics (everything other than #1 and #2) Miscellaneous/Other Waste and Reusables.*
- Gloves (reusable or compostable)
- Hand sanitizer and soap
- [Waste Sorting Form](#)
- Optional: Waste Sorting Poster
- Food Water Drought Garden Journals [3/4](#), [5/6](#) (optional)
 - Lesson #1 Waste Audit Journal [3/4](#), [5/6](#) (optional)

Prep:

- Scope out a good spot. Ideally this would be flat and shady (unless you are doing this lesson in really cold weather in which case the sun is good!)
- Check in with the custodian at least a few days before your lesson to see if they can set trash aside in your designated sorting area. Alternatively, you can also obtain trash to sort by first having a campus-wide trash pickup.
- Locate the nearest sink and make sure there is adequate soap for hand-washing.
- Create or print sorting station signs (refer to materials section).
- Print the Waste Sorting Form for each student or groups of students.
- Display the Waste Sorting Poster if you have it.
- Set up your different sorting stations with tarps and your choice of waste receptacles.
- Print off the [Waste Sorting Form](#)

Activity Procedure:

Engage:

Where does waste go when you put it in the trash? The garbage truck takes it to a landfill! What is in our garbage? At school, do you think that we throw things in the trash that shouldn't go to the landfill? What can we do with waste instead of putting it in the trash? We can recycle, reuse or compost it! Why is it helpful to learn about what we are throwing away? Why is it important to reduce the amount of waste at our school?

Explore:

Have each group look at the different waste stations you've created and the categories you will be sorting waste into.

Explain:

We are going to sort and weigh some of the waste from our school to collect data. It is helpful to know what types of things make up the bulk of what we throw away? What can be recycled? Composted?

How can we avoid sending so much material to the landfill? For example, if a lot of full milk cartons are being thrown in the trash can, we can see if there is something else students can do with the milk that they haven't consumed.

Action: Sorting

1. It's best to have an alternating group of 4-6 students participate at a time. While the class is working on individual assignments, the waste sorting groups can quietly exit the classroom and spend 5-10 minutes sorting before returning to the classroom to make space for the next group.
2. At the waste sorting station, have all students put on gloves.
3. Open a bag or bags of trash and allow students to sort the waste into the different categories. *Note: it's best not to dump bags of trash out as this creates more chaos. Simply let students reach into the garbage bags or waste receptacles to pull waste out.*
4. When each group has finished sorting, let them take off their gloves and make sure they use hand sanitizer before going to the nearest sink to also wash their hands with soap and water.
5. Once the entire class has participated and finished sorting, have students help you calculate the weight of the trash by stepping onto the scale with the filled receptacles and then stepping on again with an empty receptacle. Show students how to find the weight of the trash by subtracting the weight of the student + empty bucket.
6. Compile your data on the Waste Sorting Form, using the backside of the sheet for computations.
7. Properly dispose of the waste by placing appropriate items in the green waste bin/garden compost system, recycling bin, or bin for the landfill.

Reflect:

Share how many pounds of waste you sorted. Was that all of the waste at the school? What was the most types of waste that the school produced (paper, plastic, etc.). What are some ways that we can reduce this waste at the school?

Extension Activities:

- Take this lesson to the next level and host a campus-wide Waste Audit!
- Leading up to the Waste Audit, have students join together to plan a campus wide event. They can design posters advertising the event, and also gather facts about recycling and composting. Then, they can prepare a speech to share with the school body via loudspeaker or assembly.
- Start a Green Team to deliver lunch scraps to the compost or worm bins at your school.
- Create recycled art using things found in the Waste Audit.
- [Spanish Lesson Plan](#)