

How to Run a Waste Audit at School

Materials Needed:

- Minimum of 3 students. Ideal group size is 5 – 30.
- 1-2 chaperones / teachers
- For a group of 6-8 students: 10 bags of trash (7 classroom bags and 3 outdoor / cafeteria bags) for every waste audit hour planned. (Audits generally run anywhere from 45 minutes to 2 hours, although it never hurts to request extra bags from the janitors). NO bathroom trash should be included!
- For a group of 6-8 students: 4 long, cafeteria / outdoor tables
- 2 re-usable plastic tablecloths or 2 large tarps to completely cover tables
- Nitrile / latex & latex-free gloves
- Aprons
- Goggles (if needed)
- Garbage and recycling bags
- 6 bins for separating out different **municipal solid waste (MSW)** materials
- 6 signs designating MSW material categories for each bin:
 1. Mixed Paper & Cardboard
 2. Plastics (check with Stopwaste.org for your city)
 3. Aluminum & Steel
 4. Glass
 5. Food Scraps & Soiled Paper
 6. Waste – unrecyclable plastics, food wrappers, straws, Styrofoam, etc.
- Scale (hook-scales are best, although a bathroom scale would also do)
- Pencils
- Calculators
- Clipboards
- Tape
- Hand sanitizer
- Paper or cloth towels
- 2-4 sponges
- Eco-friendly cleaning spray (to clean off tarps & tables)
- 3 gallons of water for drinking and rinsing hands
- Paper cups for drinking
- Snacks (granola bars, apples, trail mix, etc.)
- Digital camera with extra batteries

Pre-Audit Discussion

“The laws of conservation of mass (Lavoisier, 1785) and energy (Mayer, 1842) unified by Einstein in 1907, state that energy and matter can be neither created nor destroyed. School waste audits provide your students with the opportunity to wrestle directly with the social, economic, ecological and political implications of these physical laws.”

(Adapted from San Mateo County Recycle Works http://www.recycleworks.org/schools/s_audits.html)

Tell the students that they will have the opportunity to investigate the types and amount of materials that get thrown away on campus! One of the very best (and most accurate) ways to learn about any culture is to examine its waste – and thereby determine what it values, what it doesn't, and how people live on a day-to-day basis; students will therefore be acting more like *archeologists* than custodians during a waste audit. (Perhaps ties can be made to what students are presently studying in their History / Social Studies / Anthropology classes).

Conducting a waste audit is also an eye-opening exercise in determining what a culture deems disposable and what is *made* to be disposable (uneaten food or barely-used paper versus plastic food wrappers and to-go coffee cups). Two important terms you may want to introduce are **perceived obsolescence** (materials that are still useful but are thrown out for other reasons – such as being out-of-fashion) versus **planned obsolescence** (materials that are “designed for the dump” – or are made to be thrown out because they have limited use, such as food wrappers).

Explain that the amount and type of waste generated at a school can be estimated by conducting a **waste audit**. A waste audit can provide measurements of classroom waste and cafeteria / outdoor waste for an entire day's worth of garbage generated on campus. The average student produces a ½ lb of garbage each day at school – given this information, have students calculate their school's daily average, and their school's yearly average!

This daily average, plus the data collected during the waste audit, will help determine the effectiveness of the school's general waste reduction and recycling behaviors as well as the success of Waste Action Month (WAM). Conducting multiple waste audits during the semester(s) will allow students to compare the garbage generation and disposal rates at different times of the year.

Begin by having students hypothesize what types of materials they think they will find in the school's waste stream and what the percentages of different material types will be, both for classroom trash and outdoor / cafeteria trash (e.g. "I think that 75% of all classroom trash will be mixed paper," "I think that 50% of all cafeteria / outdoor trash will be food waste," etc.). Be sure to write all predictions down so students can compare their results with their predictions after the waste audit.

Establish some Basic Rules:

- All students who sort through the trash **MUST** wear latex / Nitrile or latex-free gloves for protection. We also recommend wearing aprons and goggles to protect clothing and eyes.
- No throwing or playing with trash.
- No **EATING** trash. This may seem like a strange request – however, students will likely find unwrapped food that seems "perfectly good" to eat. Even if the item seems to be clean and is still completely sealed, it is unsanitary to eat. This is one reason why we encourage waste audit organizers to provide snacks for hungry participants who may otherwise be enticed by eating "trash."

Procedure

1. Organize the Waste Audit area as follows:
 - Set up the tables to form two, parallel lines (of two tables each).
 - Cover tables with re-usable tarps or plastic tablecloths, or expect to thoroughly scrub down the tables afterwards!
 - Secure signs designating **municipal solid waste (MSW)** material categories on each bin with tape.
 - Set up MSW bins in a row on one line of tables, so that their signs face the other line of tables where students will conduct the audit (setting up the bins at waist level helps facilitate the flow of an audit, as the signs are more easily readable than if they're set on the ground).
 - Pile all previously collected trash bags in a small mountain at one end of the tables.
2. **Overview the Waste Audit process:** students will work assembly-line style, sorting all of the classroom trash bags to the best of their ability into one of the six MSW category bins provided. Students will then weigh and visually measure (for volume) each of the bins, and record all data before emptying the bins into the appropriate waste or recycling dumpster. The process will then be repeated with all cafeteria / outdoor trash bags.
3. **Overview what can and cannot be recycled.** It helps to assemble a small sample of items in advance to show students different examples of items that are commonly found / used on campus and have students guess what MSW category they belong to.
For example: water bottles with a #1 or #2 designation on the bottom can be recycled as plastic; however, plastic bottle caps cannot be recycled and would be placed in the Waste category. Paper can be recycled, but only if it is clean and dry. Soiled paper, used napkins, and paper coffee cups cannot be recycled (unless the school has a compost).
4. Arrange students into teams to complete the following tasks, so that the waste audit flows smoothly:

- ❖ **Sorting Team:** These students will sort MSW materials into categories. Emphasize that accuracy – not speed – or quality versus quantity is most important in dividing up the waste, in order to obtain good data.
- ❖ **Weighing Team:** These students will weigh the bins, once full, and transfer the sorted MSW materials from bins to appropriate garbage and recycling bags.
- ❖ **Recording and Analysis Team:** These students will keep track of the weights and record all data into the worksheets. Be sure that students first weigh an empty bin and subtract that weight each time the bin is emptied of MSW materials (it helps to have a teacher or chaperone work with this group of students – accurate data is key to conducting a successful recycling campaign!)
- ❖ **Photographers and Journalists:** These students (1-2 of each) are responsible for capturing on film and paper the reactions of their fellow waste auditors, and the overall experience and feel of the audit. These notes and photographs can later be used as part of the students' campaign, and possibly uploaded to the school's website to raise awareness as well.

Ask if there are any questions regarding responsibilities / tasks.

5. **Suit up for safety!** Everyone – especially the Sorting Team – should gear up in aprons, goggles, and gloves!
6. Begin with all classroom trash bags: have the **Sorting Team** open one bag at a time on the tarps, and sort it into piles based on the MSW categories. The Sorting Team should then place the materials into the appropriate MSW bins.

NOTE: The categories provided are a general guide; if you have very few of some items, you can combine them into categories, or if students find a lot of one item -- such as paper bags or whole sandwiches -- they can make that a separate category.

For an especially eye-opening experience, have students put aside all wrapped or “untouched” foods – such as sealed granola bars, whole sandwiches or pieces of fruit – to find out how much “perfectly good” food their campus deems “trash” everyday.

7. Have the **Weighing Team** take each container of sorted material and weigh it on the scale. Remember to subtract the weight of the container to get the net weight of the materials inside it. If a bag doesn't weigh enough to register on the scale, count the number of items instead. Have the **Recording and Analysis Team** scribble down all data, and provide the appropriate calculations.

Be sure to visually assess the volume of each material as well. Volume is extremely important to know because it informs a school what is "filling up" their garbage and/or recycling dumpsters, and therefore determines how much a school pays to have those dumpsters emptied.

8. **Repeat Steps #6 – 9 for all outdoor / cafeteria trash bags.** Make sure all MSW bins are empty of classroom materials before beginning!
9. **Clean up!** All sorted materials should go to the appropriate waste or recycle dumpster on campus. All tarps and tables should be hosed / sponged down with an eco-cleaning spray and hung to dry (or folded away). All bins should also be hosed / rinsed out, and all students should wash up and remove all gear! The Waste Audit area (and students) should look just as it was / they were found, before the Audit began 😊

Recycling Audit: Give the traditional waste audit a twist by examining and sorting through the school's recycling bins, to determine if students and staff are actively recycling what they should be recycling, or are using recycling bins as secondary trash receptacles instead!

Food for Thought – Wrap Up

1. Re-group everyone around a whiteboard (or an indoor blackboard) and get comfortable. Have students analyze the results by graphing and discussing the data.
2. Ask students their opinions on the data they collected on the volume and weight of the waste. How much recyclable material was in the garbage? What was the most prevalent

material? What was surprising about their findings? Did their initial hypotheses turn out to be correct? Why or why not?

3. Share stories, too: what were students most surprised to find? What was the most interesting or the grossest find?
4. Lead a discussion to determine which areas need the most work, or assign a short reaction paper from students.
 - How do students rate their school's present consumption and disposal practices (have students designate a letter grade and explain).
 - How can the 4R's be applied to the materials found?
 - What specific materials should the class focus on recycling in the classroom?
 - What specific materials should students focus on recycling in the cafeteria/ outdoor areas?
 - Does the school have enough recycling bins to accommodate all of the recycling?
 - Is additional education for staff and students necessary to reduce waste?
 - What are the next steps?