

# HENNEPIN COUNTY

## MINNESOTA



# Conducting a waste sort

## How-to guide

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## What is a waste sort?



A waste sort is a process in which waste is collected and sorted thoroughly to assess a facility's waste.

Waste sorts can provide detailed information such as waste generation, waste composition, capture rates of recyclables and contamination levels, which may prove useful to improving waste management practices at your facility. However, when deciding whether to conduct a waste sort, the beneficial results should be weighed against the time and effort required to properly conduct the waste sort.

The following information will help you organize and implement a successful sort.

# Planning your waste sort

## Determining the purpose of your waste sort

It is important that your first step is considering the reasons you are conducting the sort.

Here are some situations that may call for a sort:

- Determining waste composition in the cafeteria for low-waste lunch initiatives.
- Determining the feasibility of adding organics recycling. Important data to collect is the amount of organic waste and key locations where the most organic waste is generated.
- Determining how well people are recycling. Measure the contamination rate, otherwise known as the amount of non-recyclable material, placed in recycling bins and how many recyclables are disposed of in the trash.

## Approval

Notify facility management of your proposed waste sort and include reasons for conducting a sort. It is likely that you will need them to save bags of waste from certain parts of the building, such as the cafeteria. Facility management may also be interested in the results of the study.

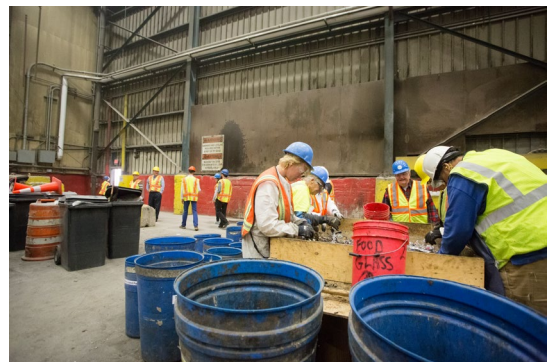
## What to collect

What you collect depends on what you are trying to find out through your sort. There is no reason to collect a large amount of waste unless you are particularly interested in studying a broad range of the waste stream for a full waste composition study. Some organizations may only be looking to reduce and recycle in the cafeteria, some organizations may be interested in the potential for reduction and recycling in restrooms, and others would like to know the big picture and sort through an entire day's worth of waste.

## Sorting categories

The number of waste-sort categories will be based on the importance of that information to your facility. Waste can be sorted into as few as two categories (trash and recycling) to as many as 20 or more categories, in which waste is further divided into specific materials of interest.

For example, trash subcategories may include Styrofoam™ products, plastic wrappers, and textiles. Recycling may consist of plastic bottles, glass bottles, mixed paper, steel cans, aluminum cans and cardboard. Organic waste usually consists of non-recyclable paper products and food. Liquid can be a category by itself.



Hazardous waste and electronic waste should not only have their own categories but will need to be disposed of appropriately.

Increasing the number of categories will increase the workload — more containers for sorting, more figures to record and report, and more intricate sorting of waste.

### Sorters



Sorting is carried out by internal staff as well as by outside volunteers who you recruit as needed.

Minors will need parental consent to participate. A minimum of two “teams” is recommended with three to four sorters per team. The more helpers you have for the sort, the better! It may be helpful to use tables. Another option is to spread a tarp on the ground.



One person will need to be the designated data recorder. To minimize errors, the data recorder should have no other job during the sort other than to record data. Another practice to minimize error is to appoint one person from each team to transport waste from the storage area to the sorting area.

Sorters should dress appropriately, wear protective equipment and use common sense to prevent injuries. Prior to the sort, a notice should be sent to volunteers encouraging them to bring along a clean set of clothing and shoes to change into after completion of the waste sort.

## Equipment and training



### Safety training

Sorters should be trained on the potential hazards of sorting through discarded material. In addition to safety equipment, follow these and other precautionary procedures:

- Be aware of sharp objects
- Be aware of hazardous chemicals
- Use available tools to take apart clumps of waste
- Look before grabbing items from the waste stream

### Protective and personal equipment

- Wear sturdy shoes and dress appropriately for sorting through waste (clothes may get dirty, pants may be preferred if sorters may be kneeling)
- Aprons
- Safety goggles
- Protective mask
- Rubber gloves. This is a thinner glove that is to be worn beneath a tougher work glove as a secondary layer of protection from leaks.
- Work gloves. Look for ones that are made of a thick rubbery material on the palm side to prevent puncture yet remain waterproof and with the upper side made of cloth for better fit and flexibility (pictured above).

## Other equipment

- Bins or buckets for sorting waste
- Scale – floor scales work well
- Data sheets or laptop for recording data
- Sorting surface, such as a long table or a tarp on the ground
- Nearby access to a drain or sink, soap and hot water
- Adhesive labels, tape
- Thick permanent marker

### Optional:

- Hand rakes and trowels for taking apart clumps of waste



## Collection of material to be sorted

Collection of waste should be done in a manner that results in a representative sample. The day on which waste is collected should be as normal of a day as possible. Unexpected events can affect waste generation and composition that skews the data. Also, it is critical to keep people in the building (except staff participating in the sort itself) uninformed of the waste sort so that results truly reflect how well people understand and sort their waste. If people know there is a waste sort happening, they could change their behavior.



Working closely with the facility's custodians is crucial to the successful collection of waste for the study. Provide a checklist as well as constant reminders to ensure waste is being properly collected. Check in with collection personnel regularly leading up to the collection day(s) as well as during the day of collection. Place signs in areas where waste is normally disposed of to remind custodians to divert waste for the study. For a sample checklist, see Appendix A.

Keep in mind that waste sorts do not happen often, so make the most of your sort by collecting information that will be useful in the future. Every bag of waste should be properly labeled with information regarding which waste stream it was discarded as (trash, recycling or organics) and the place of origin (e.g., office, classroom, kitchen, etc.) as well as any other information that you deem important.

### Storage

To prevent study samples from being accidentally taken away by your waste hauler or being mixed up with prior days' waste, provide separate containers for collection during the study period. These containers should be labeled by waste stream and placed in obvious locations so custodians remember to collect and separate waste for the sort. Whoever is collecting waste samples will place trash in the carts labeled for trash, recycling in the carts labeled for recycling, and organics in the cart labeled for organics if organics recycling is already available. The combination of labeled bags and labeled carts will help keep things organized.



Once collection is complete, move the containers to the designated sorting area to await sorting.



## Sorting area layout

The sorting area is designed around the inflow of waste to be sorted and the outflow of the same waste after it is weighed.

To start, set up a designated staging area for waste waiting to be sorted. Waste is then sorted on a table or on a tarp on the floor or ground. It works well to sort waste outside during the summer months. The number of tables/tarps to be used depends on the number of sorters (one table/tarp fits approximately four to six sorters). Surrounding each table are containers into which waste is separated by category (the number of containers around a table is based on how many categories the waste is being separated into). Label each of these containers with the type of waste it will contain (e.g., food, mixed paper, glass bottles and metal).



After waste is sorted, each container is weighed and that data is recorded. The final step in the design is an area designated for waste that has been sorted, weighed and is now ready for disposal.

# Recording and analyzing data

## Recording data

Often, waste is weighed in containers. If this is the case, be sure to subtract the tare weight of the container. Tare weight is the weight of the container when empty. Obtain tare weights on all containers prior to the waste sort and affix a label onto each container displaying its tare weight. After the waste and the container are weighed, subtract the tare weight from the total weight to get the net weight of the waste. See Appendix B for sample data sheets.



Lone items or bulky materials such as cardboard boxes may be placed directly on the scale, in which case there is no tare weight.

## Analyzing data

The following are some facts and figures that can be obtained because of the waste sort:

- Total waste generation in a specific time period (e.g., day, week) or in a specific area (e.g., cafeteria, kitchen, bathroom, etc.)
- Waste generation per capita
- Waste composition
- Recovery rate. This is the percentage of a recyclable material that was placed in the recycling stream rather than discarded in the trash. This statistic can be calculated for recycling or organics recycling streams. Recovery rate equals the weight of X material in the recycling divided by total weight of X material.

$$\text{Recovery rate (for recycling)} = \frac{\text{Materials in the recycling}}{\text{Total weight of material}}$$

- Contamination rate. This tells how much non-recyclable material was mistakenly placed into recycling containers. This statistic can also be calculated for the organics recycling stream. Contamination rate equals the weight of non-recyclable material divided by the total weight of non-recyclable material and recyclable material in the recycling stream.

$$\text{Contamination rate} = \frac{\text{Weight of non-recyclable material}}{\text{Non-recyclable material} + \text{recyclable material in recycling stream}}$$

### **Debriefing findings with waste sort participants**

Debrief data and findings with waste sort participants to uncover themes, stories, and findings. Some questions you can ask participants include: What did you notice? What did you find that was interesting/intriguing? What's going well? What needs work or what should change? What does this mean for the organization and education needs of the audience using the bins? What needs to happen next? Who will do it? By when?

## Disposal of waste

After sorted waste is weighed, it should be moved from the main sorting area to avoid being mixed with samples that have not been sorted. Dispose of waste properly. Make sure all containers are empty and the sorting table is clear before beginning to sort subsequent samples.

## Appendix A: Collection checklist

- Inform facilities management of waste sort.
- Inform and train all individuals who will be involved with collection.
- Obtain signed permission slips for any minors participating in the sort.
- Know which locations are included in the waste sort if not the entire building.
- Remind collectors about the waste sort the day before collection day.
- Remind collectors about the waste sort the morning of collection day.
- Make sure all of previous day's waste is disposed of to prevent it from being mixed with waste from the study day.
- Set up carts for collection in areas that are traveled regularly by collection personnel.
- Label carts accordingly.
- Post signs by waste disposal areas, such as exit doors, to remind collection personnel to divert waste for study into the proper containers.
- Label bags of waste by location and waste stream. All bags of waste collected for the study must be labeled. Have markers and extra blank labels on hand.
- Collect all waste from designated study period or day.
- Move designated carts to the sorting area.

## Appendix B: Sample data tables

The following is a simple data table format that you can build from to collect data from your waste sort.

Trash composition		
Material	Weight (lb)	Proportion
Recycling		
Trash		
Organics		
Liquid		
Hazardous waste (batteries, paint, aerosol cans, electronics, etc.)		
Reusable items (list items found)		
<b>Total</b>		

Recycling composition		
Material	Weight (lb)	Proportion
Recycling		
Trash		
Organics		
Liquid		
Hazardous waste (batteries, paint, aerosol cans, electronics, etc.)		
Reusable items (list items found)		
<b>Total</b>		

Organics composition		
Material	Weight (lb)	Proportion
Recycling		
Trash		
Organics		
Liquid		
Hazardous waste (batteries, paint, aerosol cans, electronics, etc.)		
Reusable items (list items found)		
<b>Total</b>		

## Contact information

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