



ELEMENTS OF WASTE

Pre-Visit Class Activity

Student Trash Journal

Description:

Students will collect, weigh, record, and analyze the amount of trash their families generate over the course of a day. Working in small groups, students learn about standard categories for disposing waste as they sort items from their family's trash. This activity addresses California Content Standards in both the Mathematics and Science content areas.

Objectives:

- Increase student's awareness of the amount of waste they generate.
- Familiarize students with the different options for disposing waste: recycle, reuse, rethinking, composting, treat as hazardous, and sending to a landfill.

Duration:

- Preparation: 30 – 50 minutes
- Instruction for Day 1: 20 minutes
- Instruction for Day 2: 50 minutes

Correlation to California Academic Standards

California Content Standards

Fourth Grade

Mathematics - Mathematical Reasoning - 2.6: *Make precise calculations and check the validity of the results from the context of the problem.*

Students estimate how much waste their family might produce and then calculate the amount of waste that would be generated if their entire community threw out the amount a student's family might throw out.

Science - Investigation and Experimentation – 6b. *Measure and estimate the weight, length, or volume of objects.*

Students measure the mass of a bag of waste using scale.

Fifth Grade

Mathematics – Number Sense 2.5: *Compute and perform simple multiplication and division of fractions and apply these procedures to solving problems.*

Students estimate how much waste their family might produce and then calculate the amount of waste that would be generated if their entire community threw out the amount a student's family might throw out.

Sixth Grade

Mathematics – Number Sense 2.1: *Solve problems involving addition, subtraction, multiplication, and division of positive fractions and explain why a particular operation was used for a given situation.*

Students estimate how much waste might be produced by their community and then calculate the amount of waste that would be generated if their entire community threw out the amount a student's family might throw out.

Education and the Environment Initiative

Principle IV - Concept c. *Students need to know that the capacity of natural systems to adjust to human-caused alterations depends on the nature of the system as well as the scope, scale, and duration of the activity and the nature of its byproducts.*

Students gain awareness of the volume of how much waste their family generates.

Materials List

- One black, kitchen trash bag per student.
- One index card per student.
- One 3' x 5' plastic tarp per group of 5 students
- One scale
- One copy of *My Trash Journal* worksheet for each student and teacher.
- Calculator

Getting Ready:

DAY 1:

- A few days before your field trip, schedule this 2-day activity.
- Send a note home to families alerting them to the field trip and Trash Journal school project.
- Hole-punch the index card for each student. They'll use this to keep track of their bag.
- Photocopy the *My Trash Journal* worksheet for each student.
- Photocopy one copy of *My Trash Journal* for you to keep.

Day 2:

- Photocopy your worksheet onto a transparency and then cut it up.
- Practice modeling how to sort the items on the transparency.
- Reserve a space on your whiteboard to collect student predictions and data.
- Determine your area's local population. The US Census provides a quick population tool:

http://factfinder.census.gov/servlet/SAFFPopulation?_submenuId=population_0&_sse=on

DAY ONE Procedure:

1. EXPLAIN ACTIVITY

- Explain to your students that in preparation for the trip to the Roseville Utility Exploration Center, they should get an idea of how much waste their families generate.
- Show the *Trash Journal* worksheet and demonstrate how to fill in each cell with information about an item that is thrown away.
- Explain that students should write down at least eight pieces. They should enter exactly **what** they throw away and **how** they throw it away. Any dry garbage that would normally get thrown into the family's garbage can will be placed in the garbage bag and brought back to school.

2. DEMONSTRATE HOW TO SET-UP BAG

- Distribute one garbage bag, one twist tie, and one note card to each student.
- Tell students to take the trash bag home that night, using it to collect all of the "dry" garbage they throw away at home.
- Instruct students to include all of their used containers, paper waste, and packaging, but not to include food waste or any other type of "wet" trash that might decompose or be unsanitary. They can include plastic bottles or cans as long as they are rinsed thoroughly and dried.
- For safety reasons, instruct students not to collect glass items and remind students that batteries should never be placed in the garbage.
- Show students how to write their name on the note card, attach it to the twist tie and then to the garbage bag.

3. MAKE PREDICTIONS

- Divide class into small groups of five students and assign each group a letter.
- Ask each group to appoint a spokesperson and then predict how many pounds of waste they think they'll bring in tomorrow as a group as well as how much the entire class will bring in.
- Record these predictions on your whiteboard.

DAY TWO Procedure:

1. WEIGH AND SORT WASTE

- Using you're *My Trash Journal* transparency, demonstrate how to sort items into categories like metal, plastic, mixed, etc.
- Invite one group at a time to come up and weigh their bags.
- Ask a student from each group to total the weights of each individual bag and add their findings to the class chart you started yesterday.
- Direct students to cut out the cards from the "Trash Journal" handout and write down each item on a separate card.
- Work with students to categorize the items.

2. CATEGORIZE TRASH ITEMS

- Once each student has sorted garbage into categories they've chosen, write these categories up on the board: Rethink, Reduce, Reuse, Recycle, Compost, Landfill, Hazardous
- Place these statements on the transparency projector:
 - Rethink: We didn't really need this.
 - Reuse: I can use it again.
 - Recycle: It can be made into something new.
 - Hazardous: It contains heavy metals or toxic chemicals.
 - Compost: It contains a lot of organic material that can decompose.
- Using the items in from your example trash, model how to use each statement to figure out which category in which the trash item belongs.
- Go around the room and ask groups to pick one item to share that their families threw away.
- If the student agrees that the items matches one or more of these statements, write it the item under each word on the board. For instance, an old soda can could fit under Rethink and Recycle.
- After you've gone around the class a few times, ask students to look at all the items listed under each category. Guide them to describe each category according to the items that belong to the category. For instance, the recycle category is made up of items like plastics and metals that can be remade into new things.
- Discuss with students how each category could reduce the amount of garbage that their families end up sending to the landfill. Lead them to identify not only

the land saved but also the energy and other resources. For example, composting would remove a lot of heavy, wet items that would cause more fuel to be expended bringing all of that waste to the landfill.

3. DISCUSS TRASH WEIGHT

- Compare the weights to the predictions. Were students surprised? Remind them that they excluded wet garbage as well as dangerous items such as glass and batteries. These are all heavier.
- Write the national average on the board: 4.3 pounds per person per day. Ask students to compare the national average to the weight of each of their bag.

Discuss: What if everyone in Roseville sent the same amount of waste to the landfill each day. Would the city of Roseville generate less than the national average or more?

- Write the area's population on the board.
- Distribute calculators and ask students to calculate how many pounds of garbage would be generated by their community each day if everyone would throw away as much as their family did. Repeat for national average. Invite students to add these figures to the chart.
- Ask student to consider the categories discussed in step 5. Which three categories could help their family and community dramatically reduce the amount of garbage thrown out on a daily basis?

4. WRAP-UP

- Ask students if they were surprised by what they found.
- Ask students if they think the amount of garbage that is being thrown away each day is a problem. If so, why? If not, why not?

My Trash Journal

Name:

Date:

My bag's weight:

Item:

What we used it for:

Mostly made out of:
 organic material plastic paper
 metal mixed

How we usually get rid of it:
 garbage can disposal compost recycle

Item:

What we used it for:

Mostly made out of:
 organic material plastic paper
 metal mixed

How we usually get rid of it:
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What we used it for:

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