# Blizzard Bag
# Lesson Plan 2

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|---|---|
| Grade Level: | 7-8 |
| Lesson: | I.A.2—What is Waste? The Solid Waste Stream<br>School Trash Analysis |
| Source: | *3Rs of the Common Core* |
| Activity/Craft: | Toilet Paper Roll Masks PDF |
| Video Link: | The Global Waste Problem (https://www.youtube.com/watch?v=nbUaB12VuHs ) |
| Game Link: | EPA Recyclecity Challenge (https://www3.epa.gov/recyclecity/challenge/index.html) |

# Lesson Matrix Grades 7-8
## 3R's of the Common Core

| Lesson | Leading Question | Objective | Common Core Alignments | | Skills |
|---|---|---|---|---|---|
| **7-8**<br>**Throwing It All Away**<br>**I.A.1** | What do you know about the solid waste we produce? | • Understand the sources, content and magnitude of the solid waste problem | **Grade 7**<br>CCRI.7.1<br>CC.W.7.7<br>CC.SL.7.1<br>CC.7.RP.3 | **Grade 8**<br>CC.RI.8.1<br>CC.W.8.7<br>CC.SL.8.1 | • Communicating<br>• Comparing multiple solutions<br>• Sharing research and writing<br>• Applying mathematical concepts |
| **7-8**<br>**School Trash Analysis**<br>**I.A.2** | What are all the things we throw away? | • Analyze waste producing habits in order to begin changing them | **Grade 7**<br>CC.SL.7.4<br>CC.W.7.4<br>CC.7.SP.1 | **Grade 8**<br>CC.SL.8.4<br>CC.W.8.4<br>CC.8.SP.1 | • Analyzing<br>• Applying mathematical concepts<br>• Investigating |
| **7-8**<br>**Potato Cakes**<br>**I.A.3** | Could we save energy and other natural resources by choosing one product or packaging over another? | • Examine the complexities of food processing and packaging | **Grade 7**<br>CC.RI.7.4<br>CC.SL.7.4<br>CC.W.7.4<br>CC.7.EE.3<br>CC.7.RP.1 | **Grade 8**<br>CC.RI.8.4<br>CC.SL.8.4<br>CC.W.8.4 | • Applying ideas to solve problems<br>• Collaborating<br>• Researching<br>• Using mathematical and computational thinking |
| **7-8**<br>**Resource Protection Game**<br>**I.B.1** | How do our activities impact on our environment? | • Identify the ecological impacts of some of the solid waste management practices on natural resources | **Grade 7**<br>CC.RI.7.4<br>CC.SL.7.1<br>CC.W.7.7 | **Grade 8**<br>CC.RI.8.4<br>CC.SL.8.1<br>CC.W.8.7 | • Collaborating<br>• Gathering information<br>• Problem solving |
| **7-8**<br>**Trash Timeline**<br>**I.C.1** | What can the waste we produce tell us about ourselves? | • Examine and classify various forms of evidence in the study of current trash and that of a past culture | **Grade 7**<br>CC.RI.7.8<br>CC.SL.7.4<br>CC.W.7.6 | **Grade 8**<br>CC.RI.8.8<br>CC.SL.8.4<br>CC.W.8.6 | • Analyzing<br>• Collaborating<br>• Sharing research and writing |
| **7-8**<br>**Art Reflecting the Environment**<br>**I.C.2** | Why do people create art?<br>What is the difference between "art" and "waste"? | • Understand the visual artist as a recorder of history and ideas<br>• Identify society's impact on artistic expression<br>• Identify potential ways artistic expression can impact society | **Grade 7**<br>CC.RI.7.1<br>CC.SL.7.5<br>CC.W.7.6 | **Grade 8**<br>CC.RI.8.1<br>CC.SL.8.5<br>CC.W.8.6 | • Analyzing<br>• Applying ideas to solve problems<br>• Questioning<br>• Sharing research and writing |
| **7-8**<br>**Waste Walk**<br>**II.A.1** | What is litter? | • Document and categorize litter in their neighborhood<br>• Explore ways to get people to stop littering | **Grade 7**<br>CC.RI.7.4<br>CC.W.7.2<br>CC.7.SP.1 | **Grade 8**<br>CC.RI.8.4<br>CC.W.8.2<br>CC.8.SP.1 | • Applying mathematical concepts<br>• Collecting data<br>• Interviewing<br>• Problem solving |

| Lesson | Leading Question | Objective | Common Core Alignments | | Skills |
|---|---|---|---|---|---|
| **7-8 Recovering Recyclables II.A.2** | How can mixed trash be separated for recycling? | • Devise materials recovery systems for recovering recyclables from the waste stream | **Grade 7** CC.RI.7.1 CC.SL.7.4 CC.W.7.4 | **Grade 8** CC.RI.8.1 CC.SL.8.4 CC.W.8.4 | • Applying ideas to solve problems<br>• Comparing multiple solutions<br>• Developing models |
| **7-8 Trash Haulers II.A.3** | How much does waste disposal cost? | • Investigate the efficiency and costs of solid waste collection<br>• Assess advantages/disadvantages of operating a recycling business and/or a curbside recycling program | **Grade 7** CC.SL.7.1 CC.W.7.4 CC.7.NS.3 | **Grade 8** CC.SL.8.1 CC.W.8.4 CC.8.SP.1 | • Gathering information<br>• Interviewing<br>• Sharing research and writing<br>• Using mathematical and computational thinking |
| **7-8 Mini-Landfills II.B.1** | What are some of the possible hazards that might result from an improperly designed landfill? | • Learn how a sanitary landfill is made and operates<br>• Understand some of the associated pollution problems | **Grade 7** CC.RST.6-8.3 CC.SL.7.4 CC.WHST.6-8.7 CC.7.G.6 | **Grade 8** CC.RST.6-8.3 CC.SL.8.4 CC.WHST.6-8.7 CC.8.G.9 | • Applying mathematical concepts<br>• Developing models<br>• Observing<br>• Providing evidence |
| **7-8 Landfill Soil II.B.2** | Why is it important to test the soils of a potential landfill site? | • Determine the importance of soil studies prior to the siting of landfills | **Grade 7** CC.SL.7.1 CC.W.7.4 CC.W.7.7 CC.7.RP.3 | **Grade 8** CC.SL.8.1 CC.W.8.4 CC.W.8.7 CC.8.F.5 | • Carrying out investigations<br>• Developing models<br>• Observing<br>• Sharing research and writing<br>• Using mathematical and computational thinking |
| **7-8 Burning Waste: Then and Now II.B.3** | Why do we burn trash? | • Research the historical perspective of burning solid waste<br>• Examine the reasons for these changes over the decades | **Grade 7** CC.RI.7.1 CC.SL.7.4 CC.W.7.4 | **Grade 8** CC.RI.8.7 CC.SL.8.1 CC.W.8.6 | • Sharing research and writing<br>• Analyzing<br>• Comparing multiple solutions<br>• Collaborating |
| **7-8 Packaging Design III.A.1** | How could packaging be designed to waste less? | • Explore parameters of packaging design<br>• Use guidelines in their own design project | **Grade 7** CC.RST.6-8.8 CC.SL.7.4 CC.WHST.6-8.7 CC.7.G.6 | **Grade 8** CC.RST.6-8.8 CC.SL.8.5 CC.WHST.6-8.6 CC.8.G.9 | • Applying ideas to solve problems<br>• Designing<br>• Researching<br>• Using mathematics |

## Lesson Matrix Grade 7-8

### 3R's of the Common Core

# Lesson Matrix Grades 7-8
## 3R's of the Common Core

| Lesson | Leading Question | Objective | Common Core Alignments | | Skills |
|---|---|---|---|---|---|
| **7-8 Source Separating III.B.1** | What is the best way to sort and store our recyclables? | • Investigate current containers and make proposals<br>• Design containers for the easy and efficient source separation of recyclables, as needed | **Grade 7**<br>CC.RST.6-8.2<br>CC.SL.7.4<br>CC.WHST.6-8.4<br>CC.7.G.6 | **Grade 8**<br>CC.RST.6-8.2<br>CC.SL.8.4<br>CC.WHST.6-8.4<br>CC.8.G.9 | • Applying mathematical concepts<br>• Collaborating<br>• Developing models<br>• Problem solving |
| **7-8 Graphing Recyclables III.B.2** | Do recycling businesses pay us for the materials we collect? | • Examine how fluctuating markets and different offered prices affect the fate of recycling | **Grade 7**<br>CC.SL.7.1<br>CC.WHST.6-8.4<br>CC.WHST.6-8.7<br>CC.7.SP.7 | **Grade 8**<br>CC.SL.8.1<br>CC.WHST.6-8.6<br>CC.WHST.6-8.7<br>CC.8.SP.4 | • Communicating<br>• Evaluating<br>• Graphing data<br>• Investigating |
| **7-8 Destination Recycle III.B.3** | When you recycle where does it all go? What does it become? | • Identify the destination and fate of their states recyclables | **Grade 7**<br>CC.RST.6-8.2<br>CC.SL.7.1<br>CC.WHST.6-8.4 | **Grade 8**<br>CC.RST.6-8.2<br>CC.SL.8.4<br>CC.WHST.6-8.7 | • Gathering information<br>• Interviewing<br>• Problem solving<br>• Sharing research and writing |
| **7-8 Making Good Compost III.C.1** | What are the essential ingredients for a successful compost? | • Conduct experiments testing the effects of too little water, nutrients, air, and imbalance of material on producing successful compost<br>• Learn the basic principles necessary to construct a good compost pile | **Grade 7**<br>CC.RST.6-8.3<br>CC.SL.7.4<br>CC.WHST.6-8.4 | **Grade 8**<br>CC.RST.6-8.3<br>CC.SL.8.5<br>CC.WHST.6-8.6 | • Collaborating<br>• Collecting data<br>• Communicating information<br>• Synthesizing |

# Where Does All Our Trash Come From?

### Concept
Analyzing the source and content of a waste streams is the first step in learning how to reduce, reuse and recycle.

### Objective
Students will analyze their waste producing habits in order to begin changing them.

### Method
Students will survey the waste produced in their school.

### Materials
School map, triple beam balance, containers to hold trash on scale, lab tongs, standard trash container (such as a brown paper bag)

### Subjects
Mathematics, Social Studies, Science

### Skills
Analyzing, applying mathematical concepts, investigating

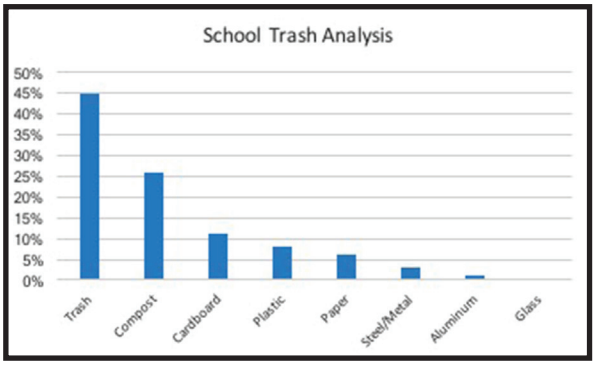
### Time
Day One: 80 minutes
Day Two: 80 minutes
Day Three: 80 minutes
Vocabulary
See handout

### Source
NRRA's School Trash Analysis (TOLD: Trash on the Lawn Day)

### 3R's of the Common Core
*Parallel Activities*
K-3, Garbage Bag Recipe
4-6, Litter Search
*Information*
The Solid Waste Stream
*Resources*
General
Environmental Education and Educational Resources

## Background
This chart illustrates the results of an NRRA School Trash Analysis completed in October 2015 at a NH middle school. The analysis shows that 55% of the school trash could have been diverted from the waste stream if materials had been recycled or composted.

Using this study as an example, you can create a current one with your class.




## Leading Question
What are all the things we throw away?

## Procedure
Day One

1. Give the class about ten minutes to brainstorm a list of things we throw away. As they are listing things, have them think about whether the items are recyclable and/or pollute (air, land or water). Discuss the results as a whole class.
2. Distribute Overview of the Waste Problem. Read the overview and discuss the meaning of the vocabulary words.
3. Tell the students that they are members of a research team that is going to take a look at waste habits of the school and offer recommendations on the findings. Hand out School Building Trash Analysis to help explain the project.

## Common Core Alignments

### GRADE 7

**CC.SL.7.4**
Speaking & Listening:
Presentation of Knowledge & Ideas

**CC.W.7.4**
Writing:
Production & Distribution of Writing

**CC.7.SP.1**
Mathematics:
Statistics & Probability

### GRADE 8

**CC.SL.8.4**
Speaking & Listening:
Presentation of Knowledge & Ideas

**CC.W.8.4**
Writing:
Production & Distribution of Writing

**CC.8.SP.1**
Mathematics:
Statistics & Probability

Day Two

1. Following the directions on the School Building Trash Analysis, have students collect and sort trash from different places in the school. All data should be recorded on a class chart and/or computer spreadsheet.

Day Three

Students write their answers to the questions on Analysis of the School's Trash as individuals, in groups or as a whole class.

## Evaluation

Worksheets.

## Classroom Activities

A. Act upon the recommendations for solving school waste problems made by the class.

B. Find out what the school is paying for waste disposal. How much money could be saved by recycling and composting instead?

C. Have class investigate amounts of household wastes from other sources (e.g.: own homes, surveys, regional solid waste districts). How can wastes be treated in the various situations?

# Overview of the Waste Problem

United States and most of the world are now facing a waste problem of huge proportions. It is estimated that every person in the United States produces 1,600 pounds of household waste per person each year. (As large as this number is, it does not include all the other wastes we dispose of, such as factory and transportation wastes.) This is by far the most waste per person from any country in the world and so we are truly the most wasteful group of people in the world. Not only does this lifestyle use up valuable resources that future generations might need, but it also threatens to pollute our land, water and air which can only result in less healthy human beings.

However, when one looks at how we live and what waste we produce there is hope that we can change some of the ways we live and leave a healthier environment. For instance, it is estimated that we could recycle 40-50%, compost 25-30% and reduce waste 5-10%. **An effort such as this could reduce the wastes we send to the landfill by 70-90%!** There are also many chemicals and other products we use that are simply not necessary. If we decide not to use many of these substances we will each be reducing the amount of waste and pollution that is entering the earth's ecosystem.

# Waste Terms To Understand:

Pollution (Air, Water and Land)
Recyclable
Compostable
Renewable Resource
Plastics
Paper
Glass
Metals
Sewage
Oil
Food
Pesticides
Groundwater
Biodegradable
Conservation
Toxic Wastes
Marine Pollution
Incineration
Love Canal
Ozone Layer Depletion
Radioactive Wastes
Fertilizers
Acid Rain

**Name:**_____ **Date:** _____

# School Building Trash Analysis

You are a member of a research team that is responsible for sampling the school environment in order to understand its waste habits. You will be assigned one area in which to collect waste samples. These waste samples will be brought back to the lab for analysis. Follow the following procedure step by step very carefully:

1. Obtain the proper size trash container.
2. Go to your area of the school.
3. Be very quiet and polite as you collect a trash container full of trash.
4. Go back to the lab.
5. Sort your trash according to the data charts.
6. Weigh out each kind of trash and record this on your data chart.
7. Record your data on the class chart.
8. Make a list of items found in each category of trash.
9. Using the class chart, copy the data from other teams on your data tables.
10. After filling out Analysis of School Trash, write out and answer the following questions:

A. Considering the data you have collected, explain what you think our school should do about its wastes. Why do you feel this way?

B. Using a map of the school, show where we could set up recycling stations. Also explain how you believe recycling could be achieved. Tell what jobs each member of our school community (e.g.: students, teachers, principals, custodians, cafeteria workers) could do to make recycling a reality (also include school groups such as student council, honor society, etc.).

C. Since not all of our school's trash ends up in trash cans, explain an idea that you have for keeping the floors of our school clean.

## Trash Analysis | Waste Basket Sample | Date:

### All weight in grams

| Area | Total Weight | Plastics | White Paper | Color Paper | Glass | Food | Aluminum | Steel | *Deposit | Cardboard |
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| **TOTALS** | | | | | | | | | | |

*Deposits from redeemable beverage containers and any fundraising item.

**Name:**_____ **Date:** _____

# Analysis of The School's Trash

You have now had a chance to examine the data you have collected. This data is useless unless we are able to understand what it means and how we can use it to improve our school. Answer the following questions to help focus your concentration:

1. What area of the school produces the most trash?
2. How much trash does the school produce each day?
3. What area of the school produces the least amount each day?
4. What is the most common kind of trash?
5. What is the least common kind of trash?
6. What percentage of trash is recyclable?

A. Add up those materials that are recyclable:

_____ Material = _____ Grams
_____ Material = _____ Grams
_____ Material = _____ Grams
_____ Material = _____ Grams
_____ Material = _____ Grams
_____ Material = _____ Grams
_____ Material = _____ Grams

_____

B. Divide the number you just got by the total weight of the materials.

Recyclable weight in grams _____
Total weight in grams _____

C. Multiple this answer by 100.

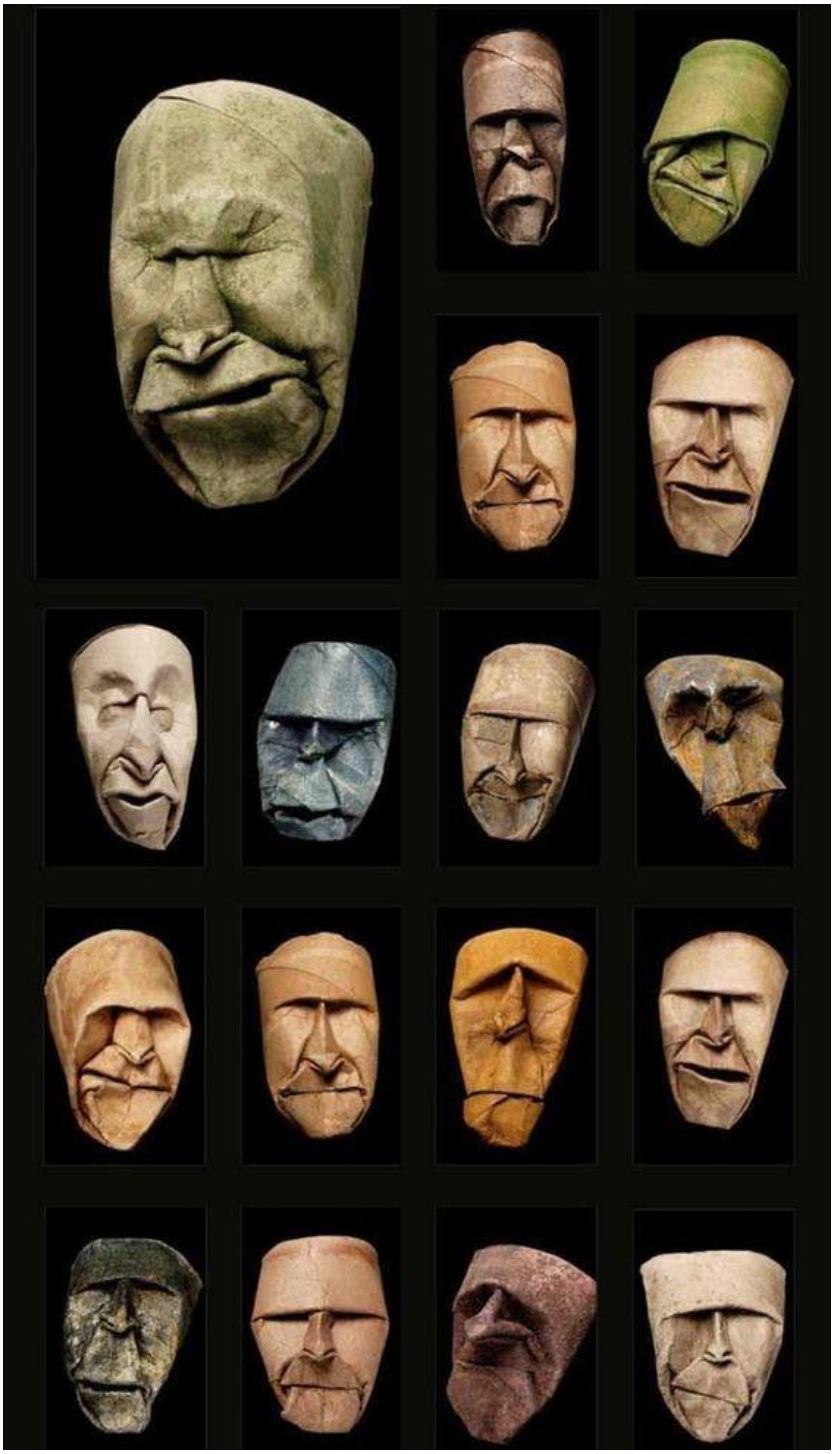
_____
x _____
= _____% Recyclable

From our Friends at Pinterest

## Toilet Paper Roll Masks

Published August 14, 2012 Written by Richard Darell

We thought we had seen it all with leftover toilet paper rolls but these masks just blew us away with their simplicity and style! See for yourself at:



https://www.pinterest.com/pin/522769469232706019/

Want to try it? Pinterest had another link that offered instructions: http://www.ucandostuff.com/Guide-1216-How%20to%20make%20faces%20while%20in%20the%20toilet%20%E2%80%93%20with%20the%20toilet%20paper%20rolls.aspx