

# Waste Reduction: Addressing the Overlooked "R"

An interdisciplinary workshop of the  
Center for Energy & Environmental  
Education and Science Education in the  
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[www.uni.edu/ceee/wastereduction](http://www.uni.edu/ceee/wastereduction)

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## Waste Reduction: Addressing the Overlooked "R"

### Major Content Points:

1) Recycling is almost always net gain for the environment and a good practice. It also is a great entry point for educating about environmental issues. However, it has its limitations. It will not "save the planet."

2) Reduction is the most preferred solid waste management strategy. Waste reduction shifts the emphasis from cleaning up pollution to avoiding it. Examples of waste reduction include light weighting (since 1970, manufacturers have redesigned pop cans to reduce their aluminum content by about 33%). Another example is the use of canvas bags at the store instead of paper or plastic.

3) We can all make a positive difference for the environment and for the quality of life of the world's citizens.

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Valuable Resources--Local experts at landfills, recycling centers and solid waste agencies want to assist educators. They provide tours, educational presentations and information.

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## Workshop Agenda

Friday evening, January 18

Welcome and Introductions

Overview of Workshop, Notebook & Syllabus

An Introduction to Waste Lesson Plans

- Wartville Wizard
- Who Polluted the Mississippi
- 72 Hours (Weigh Your Waste for younger students)
- Trash Activity
- Is Climate Change Good for Us?
- Just Look at Our Shoes

Personal Responsibility/Empowerment

Take Action Lesson Plans

- Waste Free Lunch
- Packaging: What a Waste
- Teen Population Awareness Campaign Kit
- Waste in the Cafeteria
- Agatha's Feather Bed

Reflection

Conclusion (Review Saturday's agenda)

Tip: Local experts at landfills, recycling centers and solid waste agencies want to assist educators. They provide tours, educational presentations and information.

## Workshop Agenda

### Saturday, January 19

Landfill Tour

Background Information: PowerPoint Presentations

Life Cycle Analysis Lesson Plans

- Life Cycle of a Hamburger
- Shoes (from Stuff: The Secret Life of Everyday Things)
- Quest for Less “Matching Match”
- Story of Stuff

Corporate Responsibility/Empowerment

Reflection

Global & Cultural Connections Lesson Plans

- Food for Thought
- Material World Scavenger Hunt
- How Does the U.S. Compare?
- World Population Video
- World Population Riddle
- Oral History
- Quiltmaker’s Gift

Personal Responsibility/Empowerment Lesson Plan

- Where You Are—Where the Points of Entry Are

Evaluation

Reflection

Workshop Management (Enrollment Forms, etc.)

Conclusion

# Introduction to Waste: Lesson Plans

**Wartville Wizard** (character, litter, personal responsibility)

Grades: K-6th grades

Time: 30-40 minutes

Subjects: Science, Social Studies, Family and Consumer Sciences

This lesson uses the book, *The Wartville Wizard* by Don Madden. It introduces students to litter and waste. Students are first asked to draw a self-portrait, then the teacher reads *The Wartville Wizard*. The teacher asks, "In the past year, what would be stuck to you if the Wizard were watching?" These drawings could be done anonymously, and then posted on a bulletin board. Teachers may conclude the activity by asking, "Like a fable, this story has a lesson. In one sentence, what is it?"

A variety of other activities may be found by googling "Wartville Wizard curriculum"

**Who Polluted the Potomac (Mississippi)?** (litter, hazardous materials, personal responsibility, pollution)

[http://www.uni.edu/ceee/wastereduction/alphaorder\\_lesson\\_plans.htm](http://www.uni.edu/ceee/wastereduction/alphaorder_lesson_plans.htm)

Grades: 4-8th grades

Time: 20-40 minutes

Subjects: Science, Social Studies, Language Arts, Civics, Economics, Family and Consumer Sciences, Geography, Health, History

Summary: Through an interactive story, students experience the pollution of a local river over time, and propose methods to protect the river from current and future pollution.

**Who Polluted the River?** (litter, hazardous materials, personal responsibility, pollution)

[http://www.uni.edu/ceee/wastereduction/alphaorder\\_lesson\\_plans.htm](http://www.uni.edu/ceee/wastereduction/alphaorder_lesson_plans.htm)

Grades: 1-2nd grades

Time: 20 minutes

Subjects: English/Language Arts, Geography, Science, Social Studies

Summary: In this activity, students participate in an interactive story and learn how, as human populations have increased and land uses have changed, many of our rivers have become polluted. This example demonstrates that just as we each contribute to the problem, we can also each be part of the solution.

**72 Hours** (personal responsibility, waste composition)

[http://www.uni.edu/ceee/wastereduction/alphaorder\\_lesson\\_plans.htm](http://www.uni.edu/ceee/wastereduction/alphaorder_lesson_plans.htm)

Grades: 4-12th grades

Time: 10-15 minutes to introduce assignment (give students up to 7 days to complete assignment, some may wish to do it over a weekend) Session two: 50 minutes for class discussion. More time is needed if garbage is weighed and analyzed.

Subjects: Science, Social Studies, Math, English Language Arts

Summary: In the process of collecting their personal “trash” for a consecutive 72-hour period, students develop an understanding for the need for waste reduction.

**Weigh Your Waste** (personal responsibility, waste composition)

[http://www.uni.edu/ceee/wastereduction/alphaorder\\_lesson\\_plans.htm](http://www.uni.edu/ceee/wastereduction/alphaorder_lesson_plans.htm) (Click on Quest for Less, then scroll to page 63 of the pdf)

Grades: 4-6th grades

Time: 1-2 hours, plus periodic discussions over the course of a week

Subjects: Math, Social Studies

Summary: Students collect, weigh, record, and analyze the amount of trash they generate in the course of a week.

**Trash Activity** (personal responsibility, waste composition)

[http://www.uni.edu/ceee/wastereduction/alphaorder\\_lesson\\_plans.htm](http://www.uni.edu/ceee/wastereduction/alphaorder_lesson_plans.htm)

Grades: 1-12th grades

Time: 20-45 minutes

Subjects: Economics, Math, Social Studies, Science

Summary: Sort through a household trash-bin, then talk about the items in the trash.

**Is Climate Change Good for Us?**

Grades: 6-12<sup>th</sup> grades

Time: 45 minutes

Subjects: Economics, Social Studies, Science

Summary: Identify pros and cons of climate change for various geographic regions in the U.S.

## Just Look at Our Shoes

[http://www.uni.edu/ceee/wastereduction/alphaorder\\_lesson\\_plans.htm](http://www.uni.edu/ceee/wastereduction/alphaorder_lesson_plans.htm)

Grades: 3-8<sup>th</sup> grades

Subjects: Math, Science, Social Studies

Time: 45 minutes

Summary: Inventory the number of shoes we own, where they go when we no longer want them, and how many shoes we use and eventually discard.

## Introduction to Waste:

### PowerPoint Presentations

[http://www.uni.edu/ceee/wastereduction/alphaorder\\_lesson\\_plans.htm](http://www.uni.edu/ceee/wastereduction/alphaorder_lesson_plans.htm)

PowerPoint Presentation: The Laws (Attachment I)

PowerPoint Presentation: Progress and Challenges (Attachment I)

PowerPoint Presentation: Reasons for Increase (Attachment I)

PowerPoint Presentation: Household Hazardous Materials (Attachment I)

## Take Action: Inspiring Quotes

### About Making a Difference

[http://www.uni.edu/ceee/wastereduction/inspiring\\_quotes.htm](http://www.uni.edu/ceee/wastereduction/inspiring_quotes.htm)

Quotes such as the following may be found at the web page listed above:

“Never doubt that a group of thoughtful, committed citizens can change the world. Indeed, it's the only thing that ever has.”--Margaret Mead

## Take Action: Lesson Plans

Pack a Waste-Free Lunch (empowerment, responsibility)

[http://www.uni.edu/ceee/wastereduction/alphaorder\\_lesson\\_plans.htm](http://www.uni.edu/ceee/wastereduction/alphaorder_lesson_plans.htm)

Subjects: Math, Science

Organize a Waste-Free Lunch Day.

Packaging: What a Waste! (empowerment, economic benefits)

[http://www.uni.edu/ceee/wastereduction/alphaorder\\_lesson\\_plans.htm](http://www.uni.edu/ceee/wastereduction/alphaorder_lesson_plans.htm)

Grade level: 2-5th grades

Time: 45 minutes

Subjects: Family and Consumer Sciences, Science, Math

Summary: Students are introduced to the functions of packaging, and its environmental impacts. They view products packaged in different ways, and calculate the cost/ounce. They then draw conclusions about the cost of products related to the amount of packaging.

**Packaging: What a Waste!** (empowerment, economic benefits)

[http://www.uni.edu/ceee/wastereduction/alphaorder\\_lesson\\_plans.htm](http://www.uni.edu/ceee/wastereduction/alphaorder_lesson_plans.htm)

Grades: 8th – 12th grades

Time: 40 – 60 minutes

Subjects: Consumer Economics, Environmental Science, Consumer Math

Summary: Students investigate the price and relative amount of processing and packaging of different food products in a local grocery store.

**Waste in Cafeteria** (hypothesize, responsibility)

[http://www.uni.edu/ceee/wastereduction/alphaorder\\_lesson\\_plans.htm](http://www.uni.edu/ceee/wastereduction/alphaorder_lesson_plans.htm)

Grades: 6-12th grades

Time: Part one: 30 minutes to introduce assignment, 30-60 minutes for groups to plan their strategies. Part two: 50-90 minutes to perform data collection. Part three: 30-40 minutes data analysis and begin to write lab reports/presentations. Part four: 40-90 minutes (depending on number of presentations) presenting results to class.

Subjects: Family and Consumer Science, Science, Math, Language Arts

Summary: By conducting investigations, students will determine specific amounts of waste generated by students and/or school policies regarding the use of the cafeteria.

**Teen Population Awareness Campaign Kit** (communication)

[http://www.uni.edu/ceee/wastereduction/alphaorder\\_lesson\\_plans.htm](http://www.uni.edu/ceee/wastereduction/alphaorder_lesson_plans.htm) (Click on Teen Population Awareness Campaign Kit, then scroll to page 20 of the pdf)

Grades: 6-12<sup>th</sup> grades

Subjects: Language Arts, Social Studies, Science

Summary: This 32-page kit from Population Connection is comprised of readings targeted for intermediate and secondary level students. Included in the kit are sections about “How to Make a Difference” and “Tips for Letter-Writing” to newspapers and to legislators.

**Agatha's Feather Bed** (empowerment, responsibility)

[http://www.uni.edu/ceee/wastereduction/alphaorder\\_lesson\\_plans.htm](http://www.uni.edu/ceee/wastereduction/alphaorder_lesson_plans.htm)

Grades: 4-8th grades

Time: 1-3 50-minute class periods

Subjects: English Language Arts, Reading, Science, Social Studies

Summary: This lesson is based on the book, *Agatha's Feather Bed*, by Carmen Agra Deedy. In the story, Agatha explains that "everything comes from something"—wool from sheep, linen from flax, cotton from cotton bolls. Then, in a turn-about, naked geese remind Agatha that "everything comes from something," and that her new feather bed is made from their feathers. Students explore the following concepts: everything comes from something; preparation for community recycling; and the use of "fowl idioms" in literature.

## Take Action: Website

**I Buy Different**

Grades: 6-9th grades

Check out <http://www.ibuydifferent.org/takeaction/index.asp> for positive actions students can take to make a difference.

## Selected Other Waste Resources

**Elementary books**

<http://www.uni.edu/ceee/wastereduction/books.htm>

*Recycling: A True Book; Joseph Had a Little Overcoat; Dougal the Garbage Dump Bear; Garbage Collectors; Gumfounded; Wartville Wizard; Diary of a Worm; What's Going on in There?; Chattanooga Sludge; Someday a Tree; Burn Barrel Biology; Agatha's Feather Bed; Dirt!; Compost, By Gosh!*

**Other Elementary**

Landfill Tours and Presentations; Stan Slaughter's CDs, Songbook, card game.

**Middle and High School books**

<http://www.uni.edu/ceee/wastereduction/books.htm>

*Agatha's Feather Bed; Recycling (Charlotte Wilcox); Consumption and Waste; Paper or Plastic; There's a Hair in My Dirt; High Tech Trash: Digital Devices, Hidden Toxics, & Human Health; Tracking Trash*

## Other Middle and High School

*Affluenza* DVD; *Escape from Affluenza* DVD; *Natural Connections* DVD; Population Connection's Teen Reading Series; HHM presentation from Iowa DNR/Kathleen Hennings; Landfill Tours and Presentations; *Smart Consumers: An Educator's Guide to Exploring Consumer Issues and the Environment* curriculum

## Life Cycle Analysis: Lesson Plans

Life Cycle of a Hamburger and other posters

See back side of Hamburger poster for suggested activity.

### Shoe Story (Stuff: The Secret Lives of Everyday Things)

[http://www.uni.edu/ceee/wastereduction/alphaorder\\_lesson\\_plans.htm](http://www.uni.edu/ceee/wastereduction/alphaorder_lesson_plans.htm)

Grades: 4-9th grades

Time: 20 minutes

Subjects: Geography, Social Studies

Summary: Using Reader's Theatre, students learn the manufacturing story of a pair of shoes.

### Matching Match

[http://www.uni.edu/ceee/wastereduction/alphaorder\\_lesson\\_plans.htm](http://www.uni.edu/ceee/wastereduction/alphaorder_lesson_plans.htm) (Click on Quest for Less, then scroll to page 29 of the pdf)

Grades: 1-2nd grades

Time: 60 minutes

Subjects: Art, Science, Social Studies

Summary: Students will draw a line from a product to its natural source and then color the pictures.

### Story of Stuff

[http://www.uni.edu/ceee/wastereduction/alphaorder\\_lesson\\_plans.htm](http://www.uni.edu/ceee/wastereduction/alphaorder_lesson_plans.htm)

Grades: 7th-12th grades

Time: 20 minutes for video; 20 minutes (or more) for discussion

Subjects: Health, Science, Social Studies

Summary: From its extraction through sale, use and disposal, all the stuff in our lives affects communities at home and abroad, yet most of this is hidden from view. The Story of Stuff is a 20-minute look at the underside of U.S. production and consumption patterns.

### Where You Are—Where the Points of Entry Are

[http://www.uni.edu/ceee/wastereduction/alphaorder\\_lesson\\_plans.htm](http://www.uni.edu/ceee/wastereduction/alphaorder_lesson_plans.htm)

Grades: 7th-12th grades

Time: 45 minutes

Subjects: Social Studies

Summary: This lesson is used as a follow-up to Story of Stuff video. Points of entry are places in a system where action can be taken to change the way the system works. This lesson asks students to identify these points of intervention.

## Selected Other Life Cycle Analysis

### Resources

#### Elementary books

*Agatha's Feather Bed*

#### Middle and High School books

*Stuff: The Secret Lives of Everyday Things; Life of a T-Shirt; The Life Cycle of Everyday Stuff* curriculum

#### Other Middle and High School

Story of Stuff website video; Hamburger poster; Cell Phone poster; DVD poster; *The Cost of Cool* DVD

## Corporations Take Action: Success Stories

<http://www.umich.edu/~nppcpub/resources/compendia/CORPpdfs/CORPcas eA.pdf>

--McDonald's restaurant environmental initiatives

<http://www.epa.gov/epaoswer/osw/conserva/2004news/04-star.htm> --

Starbucks' environmental initiatives

<http://www.patagonia.com/usa/patagonia.go?assetid=2329> --Patagonia's environmental initiatives

## Global and Cultural Connections:

### Lesson Plans

#### Food for Thought

[http://www.uni.edu/ceee/wastereduction/alphaorder\\_lesson\\_plans.htm](http://www.uni.edu/ceee/wastereduction/alphaorder_lesson_plans.htm)

Grades: 5-12th grades

Subjects: Social Studies, Science, Civics, Economics, Family and Consumer Sciences, Geography, Health, History

Summary: Students participate in a global simulation game that illustrates the inequitable distribution of population and resources among the different world regions.

#### Material World Scavenger Hunt

[http://www.uni.edu/ceee/wastereduction/alphaorder\\_lesson\\_plans.htm](http://www.uni.edu/ceee/wastereduction/alphaorder_lesson_plans.htm)

Grades: 4-12th grades

Time: 45 minutes

Subjects: Economics, English Language & Literature, Math, Science, Social Studies

Summary: Students learn about the lives of "statistically average" families from around the globe.

#### Material World: How Does the US Compare?

[http://www.uni.edu/ceee/wastereduction/alphaorder\\_lesson\\_plans.htm](http://www.uni.edu/ceee/wastereduction/alphaorder_lesson_plans.htm)

Grades: 6th-12th grades

Time: 3-5 45-minute class periods

Subjects: Economics, Math, Social Studies

Summary: Through the process of making double bar and circle graphs, the students develop an understanding of how the United States compares to other countries with respect to years of school, income, and other factors.

### World Population Video

[http://www.uni.edu/ceee/wastereduction/alphaorder\\_lesson\\_plans.htm](http://www.uni.edu/ceee/wastereduction/alphaorder_lesson_plans.htm)

Grades: 5-12th grades

Subjects: Social Studies, Science, Civics, Economics, Family and Consumer Sciences, Geography, Health, Science, Social Studies

Summary: This seven minute film depicts the history of human population growth and distribution from 1 AD through the present, then projects future growth to the year 2030.

### World Population Riddle

[http://www.uni.edu/ceee/wastereduction/alphaorder\\_lesson\\_plans.htm](http://www.uni.edu/ceee/wastereduction/alphaorder_lesson_plans.htm)

Grades: 5-12th grades

Subjects: Math, Social Studies, Science

Summary: Brief riddles that help students comprehend the difference between one million and one billion.

### Oral History

[http://www.uni.edu/ceee/wastereduction/alphaorder\\_lesson\\_plans.htm](http://www.uni.edu/ceee/wastereduction/alphaorder_lesson_plans.htm)

Grades: 4-12th grades

Time: 1-1/2 hours

Subjects: Language Arts, Science, Social Studies

Summary: By interviewing people at least 45 years older than themselves, students discover history of Americans' lifestyles and consumption patterns.

The Quiltmaker's Gift: Discovering Happiness (character, empowerment, responsibility)

[http://www.uni.edu/ceee/wastereduction/alphaorder\\_lesson\\_plans.htm](http://www.uni.edu/ceee/wastereduction/alphaorder_lesson_plans.htm)

Grades: 5-8th grades

Time: 45 minutes

Subjects: Reading, Math, Social Studies

Summary: The lesson revolves around the story of a quilt maker and a rich king. The quilt maker inspires the king to give up all of his possessions and, during the process, the king discovers joy in giving. Students are encouraged to explore these ideas for themselves.

## Selected Other

### Global & Cultural Connections Resources

#### Elementary

<http://www.uni.edu/ceee/wastereduction/books.htm>

*Material World* book; *Hungry Planet*; *If the World Were a Village*; *A Life Like Mine*; *Beatrice's Goat*

#### Middle and High School

<http://www.uni.edu/ceee/wastereduction/books.htm>

*Material World* book; *Recycled Life* DVD; *World Population* DVD

## Global & Cultural Connections

### PowerPoint Presentation

[http://www.uni.edu/ceee/wastereduction/alphaorder\\_lesson\\_plans.htm](http://www.uni.edu/ceee/wastereduction/alphaorder_lesson_plans.htm)

PowerPoint Presentation: Global Impacts (Attachment I)

## Student Readings

Sustainable Solutions: *We can do it* (3 pages)

[http://www.uni.edu/ceee/wastereduction/alphaorder\\_lesson\\_plans.htm](http://www.uni.edu/ceee/wastereduction/alphaorder_lesson_plans.htm) (Click on facing the Futures' Understanding Sustainability curricula, then scroll to page 70 of the pdf. Three other student readings are also available in this pdf.)

“It’s easy to feel overwhelmed, guilty, discouraged, or even angry when we hear about all the challenges in the world. However, there is good news. There are many actions that people can take to help build a bright and sustainable future. In fact, the most important solutions are ones we already know about. We just have to decide—as individuals, communities, and nations—to do them.” (first paragraph of reading)

Teen Population Awareness Campaign Kit

[http://www.uni.edu/ceee/wastereduction/alphaorder\\_lesson\\_plans.htm](http://www.uni.edu/ceee/wastereduction/alphaorder_lesson_plans.htm)

This 32-page kit from Population Connection is comprised of readings targeted for intermediate and secondary level students, as well as topics for research papers. Action steps and information about writing letters to newspapers and to legislators is included.

You’re One In Six Billion (first paragraph)

[http://www.populationeducation.org/media/upload/1in6billion\\_nov2002.pdf](http://www.populationeducation.org/media/upload/1in6billion_nov2002.pdf)

We’ve all heard the expression, “You’re one in a million!” With the ever-growing number of people on the planet, it might be more accurate to say, “You’re one in six billion!” As humans, we are all part of a giant global family made up of people from all over the world. Although we may look, act and dress differently, each person shares the same basic needs and hopes for the future. When the population of our global family grows, it becomes more difficult for our home (planet Earth) to meet everyone’s needs and wants...

# Attachment I