

Lesson Plan - Food Waste



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“Address the Excess - A Recipe for Cutting Food Waste: Peter Lehner at TEDxManhattan”

Introduction

This lesson plan supplements the TEDxManhattan video “Address the Excess - A Recipe for Cutting Food Waste” and is designed to be integrated in a variety of learning settings, both educational and recreational. This lesson may be tailored to suit the instructor’s goals and can range from 30 minutes to an hour. If the session needs to be shorter, instructors may ask students to watch the TEDxManhattan video prior to arrival.

The following plan includes:

- Lesson Goals that describe the overarching themes found in the TEDxManhattan talk and are reiterated in the lesson.
- Student Objectives that describe what the students should retain from the video and session.
- Overview, which details the flow of the lesson, including related teaching tools.
- Supplementary Resources, which are activities added to extend session, if desired.
- Pre-test and test, with answer key

Goals & Objectives

Lesson Goals

From this lesson, students will learn about:

- Food waste in the United States and globally
- How food waste impacts the environment, especially global warming
- Ways to reduce food waste
- Composting
- Expiration Dates

Student Objectives

After this lesson, students will be able to:

- Understand the characteristics of food waste
- Know ways in which to reduce food waste
- Describe what composting is and how it can help our environment
- Understand the differences in expiration date labeling
- Understand components associated with global warming

Overview

Before class begins

- The instructor projects the Pre-test on the board, or creates enough copies for all students.
- The instructor prepares to play the TEDxManhattan Video for the students (if the students have not watched prior to the lesson). The video can be found online at:
<http://www.tedxmanhattan.org/peter-lehner-address-the-excess-a-recipe-for-cutting-food-waste/>

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- The instructor ensures that enough copies of the articles listed below are printed out for the students to read in pairs, with each pair receiving both articles.

http://www.nrdc.org/living/eatingwell/files/foodwaste_2pgr.pdf

<http://www.nrdc.org/food/expiration-dates.asp>

- The instructor ensures that enough copies of the desired articles listed in Supplementary Resources are printed out for the students to read in pairs, with each pair receiving the articles.
- For potential activity at the end of the lesson, the instructor finds out if the school or venue will allow your group to create a compost bin. An example of a step-by-step how-to guide to establish a composting program at your school is provided below in this Lesson Plan.
- For potential activity at the end of the lesson, the instructor creates a salad recipe, which includes at least: romaine lettuce, carrots, cucumbers, and tomatoes. The selected foods are based on the fact that they are commonly thrown out before being consumed. Dress salad simply with oil and vinegar, to taste. Alternatively, use salad dressing of choice. Dressing is often wasted as well so this will provide the students with more examples of food waste. Try to source the ingredients as locally as possible.
- The instructor is prepared to project the Final Quiz on the board, or creates enough copies for all students.

Procedure

1) *Have students take Pre-test (see back of the lesson).*

- a) Pre-test will help students familiarize themselves with the information being discussed in class. It will also gauge how much they already know.
 - i) Another quiz will be taken at the end of the lesson to assess the retention and comprehension of the materials. Instructor should collect both quizzes to view results before and after lesson to measure the learning.

2) *After the pre-test, review answers.*

- a) Ask the students what they know about food waste, and present definitions below:
 - i) **Food losses** are defined as “the decrease in quantity or quality of food” and are the agricultural or fisheries products intended for human consumption that are ultimately not eaten by people or that have incurred a reduction in quality reflected in their nutritional value, economic value or food safety.
 - ii) An important part of food loss is “**food waste**,” which refers to the discarding or alternative (non-food) use of food that was fit for human consumption - by choice or after the food has been left to spoil or expire as a result of negligence.
 - iii) **Compost:** organic matter that has been decomposed and recycled as a fertilizer and soil amendment. Compost is a key ingredient in organic farming. At the simplest level, the process of composting simply requires making a heap of wetted organic matter known as green waste (leaves, food waste) and waiting for the materials to break down into humus after a period of weeks or months.
 - iv) **Humus:** the dark organic material in soils, produced by the decomposition of vegetables or animal matter, essential to the fertility of the earth.

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- v) **Expiration dates** - Expiration dates on food products are really more about quality than safety, and if not properly understood, they can encourage consumers to discard food that is perfectly safe to eat. Different terms for these dates include Use by, Best by, Sell by, and Expires by.
 - b) Discuss how food waste impacts the environment.
 - i) When food is wasted, the resources used to grow that feed are also wasted. About 25 percent of all the freshwater used in this country, along with 4 percent of oil, goes into producing food that is never eaten.
 - ii) Food that is wasted is taken to landfills around the country. Because there is so much food waste occurring, landfills are beginning to fill up. This is a concern for a couple of reasons. First, if we run out of space to put our food waste, what are we going to do? There will be nowhere to store the excess food waste. Secondly, and more importantly, whenever food is taken to the landfills, it emits methane, a harmful greenhouse gas that traps heat in the atmosphere. This adds to the greenhouse effect, which is also related to global warming.
 - iii) Share with students that 1/5 of all waste in the landfill is composed of food waste
 - c) Identify examples of wasteful tendencies. Ask students to discuss or journal about their food waste at home.
- 3) Play TEDxManhattan Video for students
- a) <http://www.tedxmanhattan.org/peter-lehner-address-the-excess-a-recipe-for-cutting-food-waste/>
- 4) Begin class discussion.
- a) *Have students read the articles -*
 - (a) http://www.nrdc.org/living/eatingwell/files/foodwaste_2pgr.pdf
 - (b) <http://www.nrdc.org/food/expiration-dates.asp>
 - i) Instruct the students to annotate and underline words with which they are unfamiliar.
 - ii) Have the students write two sentences that summarize the main point of each article.
 - iii) Define and discuss any words students were unfamiliar with from the article. Some possible unfamiliar terms are defined below:
 - (1) **Greenhouse Gas:** They are “gases that trap heat in the atmosphere. There are four main types of greenhouse gases: Carbon Dioxide (CO₂), Methane, Nitrous Oxide, and fluorinated gases.” These gases are part of what is causing global warming. <http://www.epa.gov/climatechange/ghgemissions/gases.html>
 - (2) **Methane:** a specific greenhouse gas that causes heat to become trapped in our atmosphere. It is bad for the environment and is a huge cause of global warming that is occurring in our world today.
 - b) After students read the articles, ask what they learned. Call on a few students to share the main point they identified in each article.
 - (1) Ask: What does Article One mean in terms of our environment?
 - (a) Have students describe food waste’s direct correlation to global warming and the effect on our environment.
 - (2) For article 2, ask the students to explain to the class how expiration dates work. This will help improve the students public speaking skills and also allow them to help reiterate what they learned from the article.

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- c) Inform the students that hunger and poverty are directly correlated - many people in developing countries are starving and there are hunger problems in the United States. There is tons of uneaten food being discarded daily in the United States and around the world.
 - (1) Discuss any current governmental initiatives regarding food waste or food/energy conversion.
 - (a) <http://www.whitehouse.gov/the-press-office/2014/07/29/fact-sheet-empowering-america-s-agricultural-sector-and-strengthening-fo>
 - (b) <http://www.foodpolicy.umn.edu/policy-summaries-and-analyses/Food-Loss-and-Waste/>
 - (2) Ask students: Can more be done to reduce the amount of food waste? If so, what are your ideas? Have them share thoughts with the class, or journal.
- 5) Instruct students to brainstorm ideas that could offer potential solutions.
- 6) Introduce Activity.
 - a) *Composting*
 - (1) If the school permits, students can set up a compost pit or bin on campus, or take further action to spread awareness of the issue. A couple of links are listed below that provide a detailed explanation of how to set up your own compost bin.
 - (2) The lesson can be extended and used in the “real world,” which would grant the students an even greater understanding of the material.
 - b) Encourage students to think about food waste while they are eating dinner at home. Tell them to look at home and how much of their dinner they do not eat. Relate it back to what was taught in class. Also, tell students to explain to their family what they have learned in class in regards to food waste and discuss how to improve the waste in their respective homes.
 - c) Tracking food waste
 - (1) Create a salad recipe that includes at least: romaine lettuce, carrots, cucumbers, and tomatoes. Dress salad simply with oil and vinegar, to taste. Alternatively, use salad dressing of choice. We chose these ingredients because we feel as though these ingredients are often wasted. For example, the head of the carrot, the top of a cucumber.
 - (a) Have students identify the waste related to each ingredient.
 - (i) Examples: plastic carton that holds tomatoes; tops of carrots.
 - (b) Have students brainstorm ways to reuse and recycle these typically wasted materials.
 - (c) Some examples: tops of carrots can be planted in water to grow a house plant (See <http://www.gardeningknowhow.com/special/children/grow-carrot-tops.htm>). Green tops can also be used to make pesto or in soups. Tomato seeds can be saved, dried, and planted. Lettuce, if wilted, can be soaked in ice water for 5-10 minutes and it will crisp up.
- 7) Have the students take Final Quiz.
- 8) Conclude Class.
 - a) Have the students share what they found the most gripping about the lesson.
 - b) Ask the students to share feedback on how to improve their community on the Change Food Tumblr page at <http://changefood.tumblr.com/>.
 - i) Content may be posted by instructor or student, as appropriate.

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Pre-Test

(Instructor may choose to ask 6 out of the 8 questions, choosing each question as appropriate to students' base knowledge of the issue)

1. Food waste is... (circle all that apply)
A. Uneaten food, which is later discarded B. Spoiled food C. Food still in your fridge
2. How much of the average landfill is composed of food waste?
A. 1/4 B. 1/5 C. 1/3 D. 1/6
3. True or False: The American family spends \$2,000 a month on food that they do not eat
A. True B. False
4. True or False: The per capita production of solid waste in the United States equals about two kilograms (nearly 4.5 pounds) per day.
A. True B. False
5. Greenhouse gases...
A. Are only caused by car emissions B. Are good for our environment
C. Block sunlight from entering the earth's atmosphere D. Trap heat in the atmosphere
6. True or false: Landfills do not pose any harmful threats to the environment or surrounding communities.
A. True B. False
7. Expiration dates use all but which of these phrases when labeling products?
A. Use By B. Expires On C. Consume By D. Sell By
8. True or False: Food waste is constantly happening and there is always something we can do to fix this issue.
A. True B. False

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Supplementary Resources

The instructor may present any or all of these additional resources for the students. These all provide beneficial information that may enhance the students' experience in the classroom, and allow a deeper understanding of the issue.

1. TEDActive2013: Diane Hatz “Food Waste”
<https://www.youtube.com/watch?v=kkHIDL6-Ynk>
2. What you can do at home
<http://www.endfoodwastenow.org/index.php/what-you-can-do>
3. How to reduce food waste in your own home
<http://eatocracy.cnn.com/2013/01/15/eat-this-list-4-ways-to-combat-food-waste-at-home-and-save-a-little-cash-while-youre-at-it/>
4. Information on landfills- “Making Mountains out of Landfills”
<http://www.pbs.org/america-revealed/teachers/lesson-plan/8/>
5. Food waste's harm to the climate- “Food waste harms climate, water, land, and biodiversity”
<http://www.unep.org/newscentre/default.aspx?DocumentID=2726&ArticleID=9611>
6. How to End Food Waste
 - a. *<http://www.endfoodwastenow.org>*
 - b. *<http://www.unep.org/newscentre/default.aspx?DocumentID=2726&ArticleID=9611>*
 - c. *<http://foodwaste.ch/english-version/> (has easy to understand infographics)*

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Final Quiz

This quiz is intended to evaluate what the students learned from the Food Waste and Sustainability Lesson.

1. Which of the following is not one of the four main types of greenhouse gasses?
A. Hydrogen B. Nitrous Oxide C. Methane D. Carbon Dioxide
2. True or false: Expiration dates are used to help consumers know when it is unsafe to consume the product.
A. True B. False
3. What percent of food in the US goes to waste?
A. 45% B. 4% C. 25% D. 40%
4. Name three ways we can start to eliminate food waste in our own homes or at school.kilograms (nearly 4.5 pounds) per day.
1)
2)
3)

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Answer Key

Key to Pre-Test

1. A, B
2. B
3. A
4. A
5. D
6. B
7. C
8. A

Key to Final Quiz

1. A
2. B- False. It is used to help consumer know when the product is at its peak quality.
3. D
4. Most answers will do, as long as they incorporate what they learned in class.