FOOD WASTE: FROM FARM TO FORK

GRADE: 3-5 Place: Classroom Duration: 45 Minutes

OVERVIEW

In this activity, students learn about the food production system, food waste and resource loss that occurs as food travels from farms to fork. Students start the activity with bags of cereal that represent apples. As the story progresses, the activity instructs students to remove cereal from their bags, symbolizing wasted apples. Students also calculate specific lost resources Including water, potential food, and land. The lesson ends with a brainstorming session of what students can to prevent food waste at home and at school.

A PowerPoint presentation, with notes, was developed to assist teachers with introducing food waste concepts, environmental resource use, social costs, financial costs and how students can make a difference by reducing their own food waste. The presentation and other resources can be found at www.SWACO.org.

LEARNING OUTCOMES

See page 4 to connect this activity to the Ohio Department of Education's learning outcomes for grades 3-5.

- Students will learn about food production and the systems that grow, process and transport food.
- Students will learn about the natural resources that are used to in our food.
- Students will practice math skills, calculating the amount of resources used at points along the production chain.
- Students will practice reading skills and new vocabulary words.

MATERIALS

- 2 boxes of cereal or pretzels.
- 1 paper cup or plastic bag per student
- 1 napkin per student
- Optional: 1 one-gallon container of water

SET UP

- Review and familiarize yourself with the "Food Waste from Farm to Fork" lesson plan as well as the "Food Waste and Natural Resources" PowerPoint presentation.
- Prepare a cup of cereal for each student with 100 pieces of cereal. If you prefer, use a non-edible material to represent apples.
- Cut out the student scripts for your students to read.

Produced with support from: PURDUE UNIVERSITY Extension SAVE MORE THAN FOOD MAKE A DIFFERENCE SWACO

INSTRUCTIONS

1. Walk through the "Food Waste and Natural Resources" PowerPoint presentation with students while discussing resource use, global ecosystems, and the food production system as presented in the PP presentation notes.

2. Pass out the "Life of an Apple" student copies, as well as cereal and napkins to each student.

3. Lead students through “The Life of an Apple” story, asking students to volunteer to read to the class. When the directions indicate, have the students remove the correct amount of cereal from their cup. Follow the teacher guide for instruction on where to stop for calculations and add additional comments.

KEY TERMS

- **Natural Resource** – Material extracted from nature, not made by humans. Material such as: ores, plants, animals. The source of all consumer products made of paper, plastic, steel, aluminum, glass, etc.
- **Consumer** - A person who purchases goods and services for personal use.
- **Food Production System-** the steps along a food's journey from the farm to consumers to disposal.
- **Orchard** - A farm that grows fruit trees.
- **Harvest-** the process of picking or collecting crops from where they were grown (the apple orchard).
- **Post-Harvest Station-** Location where newly harvested foods are cleaned, sorted, and packaged.
- **Processing Station-** the factory, kitchen facility, or other location where raw materials are turned into final products. In our story, this could be a factory that bags apples for the grocery store or makes apples into apple sauce.

ADDITIONAL RESOURCES

Additional SWACO Food Waste Resources

- Food Waste and Natural Resources PP presentation to provide better understanding of the connection between the food we eat and the Earth's limited natural resources.
- Points for Prevention- competitive take-home activity to encourage students to put food waste prevention into practice at home.
- Building a Share Table in Central Ohio K-12 Schools- administrative guidance for building a successful share table program to reduce cafeteria food waste.
- Share Table School Announcements- suggested scripts to remind and encourage students to participate in share tables.
- Pre- and Post- Assessment Worksheets for learning outcomes from SWACO Food Waste Resources.
- Zero Waste Lunch Poster- promoting methods for waste reduction in school lunches.
- Go to www.COFWI.com for additional resources from other schools and organizations across the United States.

SWACO Recycling Resources

- SWACO's 4r's PP Presentation- Introduces recycling concepts
- SWACO Personal Recycling Survey -parent engagement tool to encourage recycling habits to carry over to homes.
- SWACO Personal Trash Survey- awareness tool to encourage students to take responsibility for their Individual waste production.
- Go to www.SWACO.com for additional recycling education resources.

CONNECTING TO OHIO'S LEARNING STANDARDS

The chart below lists the learning standard course themes that this activity can be used to teach or practice. The subject areas below reflect the most updated Ohio Department of Education's Learning Standards as of December 2019.

SUBJECT	COURSE THEMES	GRADE 3	GRADE 4	GRADE 5
Social Studies	Geography	Places and Regions (5), Human Systems (6,7)	Places and Regions (10), Human Systems (12)	Human Systems (7)
	Economics	Scarcity (15), Production and Consumption (17)	Production and Consumption (21)	
Science	Earth and Space Science	Earth's Resources (3.ESS.3)		
Math	Operations and Algebraic Thinking (OA)	Multiplication & Division (3.OA.1), Multiply & Divide In 100 (3.OA.7)	Use the Four Operations (4.OA.2, 4.OA.3)	
	Measurement and Data (MD)	Work with Time and Money (3. MD.1),	Converting unit measurements (4. MD.2)	
	Number and Operations		Build Fractions from Unit Fractions (4.NF.4)	Multi-digit and decimal operations (5.NBT.5)
Reading	Reading Informational	Read for answers (RI.3.1), Information from Illustrations (RI.3.7)	Interpret visual and oral information (RI.4.7)	Determine word meanings (RI.5.4)
	Reading Foundations	word analysis skills (RF.3.3)	Decoding words (RF.4.3)	Decoding words (RF.5.3)
	Speaking and Listening	Collaborative Discussions (SL.3.1), Speaker Questions (SL.3.3)	Engage in collaborative discussions (SL.4.1)	Engage in Collaborative Discussions (SL.5.1)

Food Waste From Farm to Fork: Teacher Activity Guide

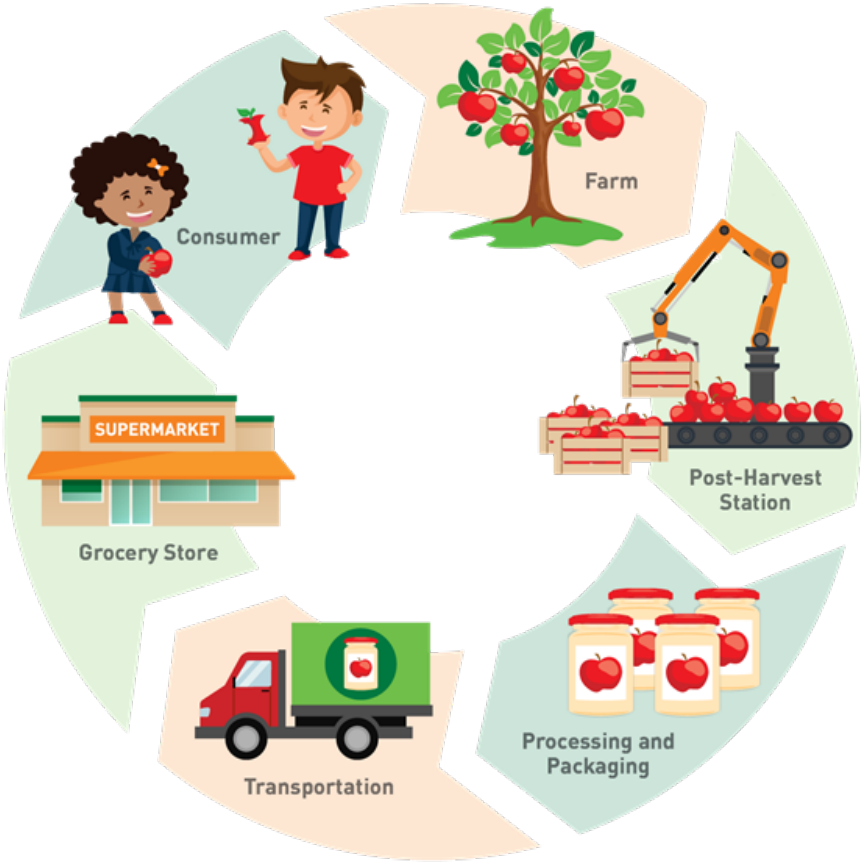
Please find all suggested teacher commentary and solutions to calculations In bold.

1)

In today's activity, we follow the journey of apples as they make their way through the Food Production System. The food production system is the steps that our food takes to move from the farm where it was grown, to our plates.

2)

The chart below shows the steps of the food production system for apples. These steps are:



Walk students through the diagram, pausing to point out examples that students may recognize from their own lives.

3)

There once was a crop of 100 happy apples living in an orchard. One day, those apples were picked and put on a truck to go to the post-harvest station. Sadly, only 80 of the 100 apples made it onto the truck. Twenty of the apples were left in the orchard to rot.

Remove 20 "apples" from your cup.

Pause for a moment to point out the farm and the post-harvest station on the food production system model. Explain that a farm that grows fruit trees like apples Is called and orchard and the place there apples are organized Is the post-harvest station.

4)

Apples are left in the orchard for many reasons, including:

1) the grocery store does not need all the apples;

2) there are not enough people to harvest the apples;

3) the apples do not look perfect.

5)

It takes 36 gallons of water to grow a single apple. How much water was just lost when those 20 apples were not harvested?

(36 gallons of water x 20 apples = 720 gallons of water). And that doesn't include water wasted to produce apples that will be wasted down the production road.

6)

Next, the 80 remaining apples arrive at the post-harvest station. Three more apples are wasted because they are the wrong size, shape, or color, or have too many bruises.

Remove three more "apples" from your cup.

7) **(This problem Is recommended for 5th grade)**

Remember that many times apples are left in orchards because they are not perfect looking. If those apples had been picked-up and brought to the post-harvest station, they could have been chopped up or peeled or cooked. In that case, bruises could have been cut off and unusual shapes would not matter becausee they still taste delicious!

Let's say that you cut off ¼ of each apple because it is bruised. Using the 20 apples that were left in the field, how many servings of applesauce could have been made?

Guide the students in setting up the following calculation: every apple can be made into 1 serving of applesauce, but don't forget that you had to cut off the bruises.

First, we cut off ¼ of each apple to remove the bruise. 1 apple minus ¼ apple leaves ¾ apple behind.

Second, we have 20 apples x ¾ of each apple x 1 serving of applesauce per apple = 16 servings of applesauce

That's 16 servings of delicious and nutritious applesauce that you could eat or give to a member of your community who needs a healthy snack.

8)

Now, at the processing and packaging station, some bruises were removed, and stems and cores are cut off so that some apples could be used in fruit trays. Only one apple was lost at this station.

Remove one "apple" from your cup.

9)

Next, the apples go to the grocery store. They look perfect and ready to be purchased. After a while, some of the apples that had been there for a long time begin to look dull. Their colors change, and a few apples show bruises on their skin. The grocery store had ordered too many apples.

10)

The apples go on sale, but some of them are never purchased because people want their apples to look perfect. Sometimes over-ripe apples can actually be sweeter than perfect-looking apples and can be used to make baked goods and applesauce. Twelve apples were wasted at the grocery store.

Remove twelve "apples" from your cup.

Ask your students what they would make with extra overripe apples. (Example: apple pie, apple cake, bakes apples, apple sauce, etc.)

11)

Some of the apples were purchased from the grocery store but not eaten by consumers. Twenty-eight apples of our apples are wasted by people like you and me.

Remove 28 apples from your cup.

Point out that more apples are being wasted by consumers than at any other step In the process.

12)

Consumers waste food because they buy too much, they wait too long to eat It, or because think they cannot eat food that looks "ugly."

13)

If 28 apples were wasted by consumers, how much money did people like you and me spend on food that they didn't eat? Each apple costs $0.45.

(28 apples x .45 per apple = $12.60)

That means that for every 100 apples that are produced, people like you and me spend $12.60 on apples that we are going to throw away.

The average cost of a fresh apple ($0.45) is based on a 2018 USDA estimate, assuming an average apple volume of 1 cup.

14)

Now that the apples have gone through the food production system from producer to consumer, count the total number of apples on the table to find the total number of apples that were produced but never eaten.

15)

How many apples were wasted out of the original 100 apples?

That means that for every 100 apples that are produced, as many as 64 are wasted! That's more than half!

Apples are one of the more commonly wasted foods because they are fresh, easily accessible, and popular.

Who wasted the most apples?

What can we do about that?

There is a lot of work and natural resources that go into making delicious food- so let's make sure it is all eaten!

Instruct your students to either help themselves to the cereal now or to pack the cereal Into their backpacks for an after school snack.

Optional Post Activity Discussion Questions:

- **What did you learn from today's activity?**
- **Where In the food production system did the most apples go to waste?**
- **As consumers, what can we do to reduce the apples, and other foods, that we waste?**
- **What resources were used to grow the apples?**