



Exploring the Impacts of Feeding the World

In this **two-day** lesson, students will be introduced to several issues related to the social, economic, and environmental impacts of our current food system, including food waste, food deserts, agricultural land use, and the environmental impacts of diet choices.

On Day 1, students will explore how too much food and too few food options are both important issues that need our attention. Students will interpret maps to try to identify food deserts in San Francisco. They will also examine three (perhaps surprising) examples of food items that are often thrown away but are in many cases usable and edible, like misshapen produce, foods with 'expired' sell-by dates, and leftover or surplus food.

On Day 2, students will examine how both agriculture and the foods we choose to eat can impact the environment. They will explore the impacts of clearing land for agriculture by visiting the [World Wildlife Fund's website](#) to learn more about how and where rainforests are being cut down to make more room for crops or cattle. They will also compare the 'land footprints' of different kinds of foods and diets by looking at what different people around the world eat using [interactive graphs by National Geographic](#).

This lesson is one in a series of activities that introduce students to design thinking through the lens of exploring global food issues and the strengths and weaknesses of various solutions to these issues. Use this lesson independently or within the **Flipside Science Our Hungry Planet: Food For a Growing Population** unit.

Grade levels: 6-8

Essential questions

1. What factors limit or influence the types of foods that people can buy or eat?
2. What impact do our diet choices have on the environment?
3. Why does perfectly good food get thrown away?
4. How does clearing land for agriculture impact various ecosystems?

Objectives

Students will

1. Explore several issues surrounding our current food system, including food waste, food deserts, agricultural land use, and the environmental impacts of diet choices.



Grade levels: 6-8

Total activity time: 2 hours over two days

Materials needed:

- Projector
- Flipside Science video
- Computer lab
- The Environmental Impact of Feeding the World Journal (1 per student)
- misshapen fruits or vegetables
- empty restaurant take-out containers
- packaged food items with 'expired' sell-by dates
- processed and packaged convenience store food items



2. Learn more about how food sustainability and environmental issues are impacting people and habitats around the world.

Terms for students

- **Sustainability:** the ability of a system to last or endure; meeting current human needs without endangering our descendants
- **Land footprint:** the total amount of land required to produce something (e.g., to grow crops, to raise farm animals, or to mine minerals)
- **Food system:** all of the steps a food goes through from being grown to being consumed, including packaging, transporting, and selling.

Materials needed

- Computer with Internet access
- Projector
- **Flipside Science video: *The Environmental Impact of Feeding the World***
- A computer lab with at least one computer for every 2 students (for Day 2 only)
- ***The Environmental Impact of Feeding the World Journal*** (1 per student)
- A few (2-3) very misshapen fruits or vegetables (e.g., from a local farmer's market)
- A few (2-3) empty restaurant take-out containers
- A few (2-3) packaged food items with 'expired' sell-by dates (but that are not spoiled)
- Examples of processed and packaged convenience store food items (like cheese puffs, candy, bottle of soda)

Activity Procedure

Total Activity Time: 2 hours over two days

DAY 1

Activity prep

1. Print out one ***The Environmental Impact of Feeding the World Journal*** per student
2. Set up stations around your classroom with the following materials:





Food Waste Station: Misshapen fruits/vegetables, empty take-out containers, packaged food items with 'expired' sell-by dates

Food Deserts Station: Examples of processed and packaged convenience store food items

Part I: Introduction to food sustainability and environmental issues (15 min.)

1. Introduce your students to food sustainability and environmental issues by showing them the **Flipside Science: The Environmental Impact of Feeding the World** video.
2. Ask for volunteers to talk about one or two things they learned from the video, and make a list of these things on the board. Explain that the youth in the video are talking about some important environmental and sustainability issues related to food. Check that students have an understanding of what 'sustainability' means.
3. Replay the video for students a second time.
4. Working in pairs, students will dive deeper into two of the food sustainability and environmental issues introduced in the video (they will explore the other two issues during the following class period or hour).

Part II: Exploring examples (30 min.)

1. Divide students as appropriate among the stations so small groups can explore the materials up close. It may be best to have students pair up with a single thinking buddy as they complete their journal.
2. Give students 15 minutes at each station, and then have them switch.
3. After students have completed the two activities, bring everyone back together as a class.

Part III: Day 1 reflection (15 min.)

1. Ask students to share some of their thoughts from the food waste station activity. After you have heard from several students, tell the class that all of the food items at that station are edible and unspoiled.
 - a. *Why do you think people don't like to eat produce that isn't perfectly shaped? How could you inspire or encourage people to embrace misshapen fruits and vegetables?*
 - b. *What do you think the 'sell by' date on a food package actually means if it isn't the date the food is no longer edible? Why do the producers put this date on there?*
2. Ask students to share some of their thoughts from the food deserts station activity.
 - a. *How do you think we could help people who live in food deserts to have better access to fresh, healthy, and affordable foods?*

Teacher tip: If you are not able to devote two days to all of the Journal activities, you can assign the remaining activities as homework!





DAY 2

Activity prep

Students will continue to work through the two remaining activities their Journals: Clearing Land for Agriculture and Comparing Diet Land Footprints. These activities require students to have access to computers with Internet connections.

Part I: Exploring examples, continued (30 min.)

Book the computer lab for a full class period, and have students work in pairs to complete the rest of their journal. Leave 15-20 minutes at the end of the class period for reflection and discussion.

Part II: Day 2 reflection (30 min.)

1. Ask students to discuss some of their thoughts from the two web activities in small groups, then discuss as a class:
 - a. *How can the choices you make about what you eat impact the environment?*
 - b. *Why is the land footprint of meat larger than it is for vegetables and grains?*
 - c. *What influences the choices people make in the foods they eat? Are people's diets controlled solely by their likes and dislikes, or do other factors play a key role?*
 - d. *How could we grow more food with less land?*
2. **Individual quiet writing reflection:** Have students consider all four of the food sustainability and environmental issues that they explored over the past two days: food waste, food deserts, agricultural land use, and the environmental impacts of diet choices. Ask them to consider if they feel impacted by any of these issues. If so, which ones? How are they impacted? Do they know anyone else directly impacted by the same or different issues? Are there any easy solutions to these kinds of issues?

Next steps

Challenge your students to brainstorm solutions to some of the issues surrounding our global food system in the next activity in this **Flipside Science** unit, **Rapid Brainstorming: How Can We Improve Our Global Food System?**





Our Hungry Planet: Food For a Growing Population



Food for Thought:
Defining a Problem to Find a Solution



Exploring the Impacts of Feeding the
World



Rapid Brainstorming:
How Can We Improve Our Global Food
System?



Sustainable Food Solutions:
Weighing the Pros and Cons



Our Hungry Planet:
Design Thinking Challenge

About Flipside Science

Flipside Science is a youth-powered series that tackles complex environmental topics and empowers viewers to make a difference. This engaging and upbeat collection of videos, hosted by Academy youth, explores how local communities are addressing environmental problems with solutions ranging from vertical farming to greywater recycling.

Head to [Flipside Science](#) to find the complete list of videos and activities in this series.

Next Generation Science Standards (6-8)

MS-ESS3.C: Human Impacts on Earth Systems: Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth's environments can have different impacts (negative and positive) for different living things. Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise.

California's Environmental Principles and Concepts

- **Principle I:** The continuation and health of individual human lives and of human communities and societies depend on the health of the natural systems that provide essential goods and ecosystem services. As a basis for understanding this principle:
 - **Concept a:** Students need to know that the goods produced by natural systems are essential to human life and to the functioning of our economies and cultures.
- **Principle IV:** The exchange of matter between natural systems and human societies affects the long-term functioning of both. As a basis for understanding this principle:
 - **Concept a:** Students need to know that the effects of human activities on natural systems are directly related to the quantities of resources consumed and to the quantity and characteristics of the resulting byproducts.





- **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.
- **Principle V:** Decisions affecting resources and natural systems are based on a wide range of considerations and decision-making processes. As a basis for understanding this principle:
 - **Concept a:** Students need to know the spectrum of what is considered in making decisions about resources and natural systems and how those factors influence decisions.

Additional resources

- [National Resources Defense Council: The Dating Game: How Confusing Food Date Labels Lead to Food Waste in America](#)
- [California Academy of Sciences: Sustainable Grazing lesson](#)
- [California Academy of Sciences: How did human civilization spread? visualization clip](#)
- [World Wildlife Fund: Deforestation](#)
- [National Geographic: What the World Eats](#)
- [Sustainable Communities Index](#)

