



Sustainable Food Solutions

Weighing the Pros and Cons

How do we assess the benefits and drawbacks of various solutions to a problem? To decide how one potential solution compares to another, we have to consider the pros and cons of each from many dimensions, including environmental, social, cultural, and economic. In this activity, students will work together to map out the strengths and limitations of potential solutions to some important global food system issues.

This lesson is part of a larger unit, **Flipside Science: Our Hungry Planet: Food For a Growing Population**. In this unit, students practice different steps in design thinking within the context of issues surrounding our global food system. Engage your students in creative ideation with the preceding activity in this unit, **Rapid Brainstorming: How Can We Improve Our Global Food System?** At the end of this unit, your students can participate in a design thinking challenge to tackle a sustainable food issue at home or school.

Grade levels: 6-8

Essential questions

1. What are the advantages and disadvantages of different solutions that have been proposed for global food system issues we are facing in the world today?
2. How do we assess the environmental, social, cultural, and economic benefits and drawbacks of various solutions to a problem?
3. How do we ultimately decide what solution is the 'best'?

Objectives

Students will

1. Explore some of the solutions being proposed for global food system issues like food waste, diets, land use, and food deserts.
2. Learn how to evaluate and compare various solutions to a problem by mapping out the multidimensional strengths and weaknesses of each.

Materials needed

- Computer lab with one computer for every student (computers should have Internet access) and one computer that the instructor can project from
- One pair of audio headphones for each student
- Projector

Grade levels: 6-8

Total Activity Time: 60 minutes

You will need:

- Computer lab
- Headphones
- Projector
- Flipside Science videos
- Student Worksheets





- Flipside Science videos:
 - The Environmental Impact of Feeding the World
 - Urban Farming: Can Our Cities Grow Local, Affordable Food?
 - Vertical Farming: Growing in New Directions
 - Reducing Food Waste: Save Food to Save the Planet
 - Think Before You Eat: How Your Food Choices Can Save the Environment
- Student Worksheets (1 per student)

Pre-Activity

If you are using this activity within the **Flipside Science: Our Hungry Planet: Food For a Growing Population** unit, it is recommended you progress through the **Food for Thought: Defining a Problem to Find a Solution, Exploring the Impacts of Feeding the World,** and **Rapid Brainstorming: How Can We Improve Our Global Food System?** lessons before continuing with this one. You can also use this lesson independently.

Activity Procedure

Total Activity Time: 60 minutes

Part I: Exploring Global Food Issues (15 min.)

Teacher note: *If you preceded this activity with the **Exploring the Impacts of Feeding the World** and/or **Rapid Brainstorming: How Can We Improve Our Global Food System** activity, you can skip to Part II.*

1. Hand out to students or write on the board a list of questions for them to think about while they watch the **The Environmental Impact of Feeding the World** video (see below).
2. Show students the **The Environmental Impact of Feeding the World** video.
3. Ask student to jot down some of their thoughts about the questions that they were asked to consider while watching the video. Give them 5-10 minutes to do this. You might want to play the video another time through for students. Discuss these questions as a class after students have had a change to reflect individually.
 - a. *What kinds of food issues were raised in the video?*
 - b. *What impacts does agriculture have on the environment?*
 - c. *How is the American diet different from other diets around the world?*
 - d. *Does everyone have the same food choices? What influences the types of foods a person has access to?*
 - e. *What do you do with food on your plate that you don't finish?*





4. Ask students to choose one of the main global food issues introduced in the video to focus on (food waste, food deserts, land use, and diet) and to find a partner who chose the same issue. *Note: To expedite this process or if you would like to ensure that all food issues are represented, you can also have students pick food issues out of a hat and pair up that way too.*

Part II: Exploring Global Food System Issues (25 min.)

1. Hand out one **Student Worksheet** to each student. Explain to students that they will be watching videos that will introduce them to some possible solutions that people have thought of for the issue on which they are focusing.
2. With their partners, students will guide themselves through the activity as outlined on their **Student Worksheets**. During this time, students will be asked to watch the Flipside Science food solution video for the problem they chose to focus on and to proceed through an exercise weighing the pros and cons of the solution(s) introduced in the videos. Remind students to wear headphones while watching the videos on their own computers. As they work, walk around the classroom and ask different groups to explain their thinking. Probe them to uncover environmental, social, cultural, or economic factors that relate to proposed solutions.
3. Remind students when they have 15 minutes and 5 minutes left in the activity.

Teacher tip: *The solutions introduced in the Flipside Science videos are not the only solutions, nor necessarily the best solutions for the food issues they address. To help you facilitate students' evaluations of these different solutions, we've created a supplemental **Teacher Toolkit** for each solutions video. Each toolkit contains more information about the solutions outlined in the videos, as well as the pros and cons of these solutions. It is recommended you familiarize yourself with these toolkits before this activity.*

Wrapping Up (20 min.)

1. Come back together as a class, and ask students to share out (in 1-2 minutes) the food issue they focused on and the pros and cons of the solutions they explored.
2. Ask students to reflect on their experience.
 - a. *Do we have one perfect solution for each of these issues? Why or why not? Do you think one exists?*
 - b. *What steps can we take to try to develop the best solutions we can?*
 - c. *What does it mean to consider the different 'dimensions' of a problem or solution? (E.g., economic, environmental, social, cultural, etc.)*
 - d. *Why is it important for you (as young people) to think about these issues?*

Next Steps

Our Hungry Planet: Food For a Growing Population Design Thinking Challenge: Challenge your students to apply their design thinking skills and design a solution to a sustainable food issue at home or school! Choose from a spectrum of challenges one that suits your available class time and resources.





Our Hungry Planet: Food For a Growing Population



Food for Thought:
Defining a Problem to Find a Solution



Sustainable Food Solutions:
Weighing the Pros and Cons



Exploring the Impacts of Feeding the
World



Our Hungry Planet:
Design Thinking Challenge



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

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)

Engineering Design in the NGSS: *At the middle school level, students learn to sharpen the focus of problems by precisely specifying criteria and constraints of successful solutions, taking into account not only what needs the problem is intended to meet, but also the larger context within which the problem is defined, including limits to possible solutions.*

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.
- **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

- [Design for Change design thinking for students: Feel-Imagine-Do-Share](#)
- [NPR KQED Public Radio: To Cut Food Waste, Spain's Solidarity Fridge Supplies Endless Leftovers](#)
- [NPR KQED Public Radio: Green Pie in the Sky? Vertical Farming is on the Rise in Newark](#)
- [California Academy of Sciences Science News: Bay Area Urban Farms](#)
- [California Academy of Sciences Science News video: Sustainable Family Farming](#)

