



Food for Thought

Defining a Problem to Find a Solution

The purpose of this activity is to give students practice *putting a design problem into perspective*. Students will gain insight into the challenges associated with meeting various design requirements and the importance of collecting information through interviewing others.

In this activity, students are challenged to design a food menu for a class party that will be held at their school. The food plan must meet several conditions. For example, everyone in the class must be able to eat the food, and there is a budget for the meal. The design constraints that students must consider in this exercise correlate with many issues that people face in the food choices they make in their everyday lives, such as dietary restrictions, financial constraints, and food availability.

This lesson is one in a series of activities that introduce students to various steps in 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. When we are designing a plan, what kinds of questions can we ask to understand the conditions or constraints of the plan and the people who will be impacted by it?
2. How does asking questions and interviewing others help us with a design problem?
3. What are some challenges with trying to find one solution that meets several different conditions?

Objectives

Students will

1. Practice developing questions and interviewing others to gain a sense of why these are important first steps in the design thinking process.
2. Consider how a variety of constraints or criteria influence a design plan within the context of planning the menu for a class party that meets several different conditions.

Materials needed

- Sticky notepads (enough for at least 10 sticky notes per student)
- Interview Worksheets (1 per student)
- (optional) Printed map (with scale bar) of area surrounding your school showing the locations of

Grade levels: 6-8

Total activity time: 60 minutes

Materials needed:

- Sticky notes
- Interview worksheet
- (optional) Printed map





restaurants, grocery stores, convenience stores/markets, etc. (Teacher tip: You can search for 'food,' 'grocery stores,' and 'convenience stores' in [Google Maps](#) for these locations.)

Activity prep

1. Attach 10 sticky notes to each student's desk.
2. Prepare the board with the Design Challenge ("Plan a Class Meal!") and the constraints: "Everyone Likes/Can Eat," "No Wasted Food," "Within School Radius," and "Limited Budget." Students will place their questions on post-its underneath these headings during Part I.
3. Print out student worksheets and the map around your school.

Activity Procedure

Total Activity Time: 60 minutes

PART I: Understanding your constraints (30 min.)

NOTE: *In this activity, students will NOT actually be coming up with complete plans for the party food, but will concentrate instead on how one goes about collecting the information needed for a design plan and how to work around certain restrictions or conditions.*

1. Welcome, designers! Set the stage for this design thinking unit, noting today's focus is on generating questions we can ask that help us better understand the problem for which we are designing a workable solution.
2. Introduce the design challenge: Imagine we are planning a class party at school and that the class is responsible for purchasing the food for the party. Doing this, however, won't necessarily be as simple as going to the grocery store and buying a bag of potato chips and a cake. There will be certain conditions that must be met:
 - **Everyone in the class must like the food AND be able to eat all of the food.**
 - **No food can go to waste.**
 - **The food has to come from within a 1-mile radius of the school.** (Note: Depending on the location of your school, you might need to expand this radius. Try to make sure there is access to at least one convenience store or market.)
 - **There is a limited budget for the food.** (Don't actually give students a number—let them ask this question in step 4 below!)
3. What steps should be taken to design a plan for the party food that meets all of these conditions? An important first step in design thinking is to better understand the people who will be impacted by your design plan, as well as the constraints or restrictions you must design within. **How do we gain this better understanding? By asking questions!**





4. **Generating questions:** Ask students to take 5 minutes to write down questions they might ask to either their fellow classmates or their school administrators (one question per sticky note) to help them design a party food plan. Ask for an example or two before you let them brainstorm individually:

Examples:

- **(To a classmate) Do you have any food allergies?**
 - **(To a school administrator) What is the budget?**
5. After 5 minutes of question writing, divide students into groups of 4. Give them about 5 minutes to share their questions within their groups.
 6. Come back together as a class and ask for a few volunteers to share their questions. After eliciting a few responses, ask each group to elect two people to bring all of their sticky notes (minus duplicate questions) up to the board and stick them underneath the constraint that they most relate to. Here are some questions that your students might come up with and the party food parameters they would go under:
 - **Everyone in the class must like the food AND be able to eat all of the food:**
 - a. *Are you (fellow student) allergic to any foods?*
 - b. *Are you a vegetarian?*
 - c. *Are there any foods you can't or won't eat?*
 - d. *What are your favorite/least favorite foods?*
 - e. *Is there a particular type of cultural cuisine that you prefer?*
 - **No food can go to waste:**
 - a. *Can we store any leftovers in the school refrigerator and pantry?*
 - b. *Would you (another student) be willing to take any leftover food home?*
 - c. *Could we donate any leftover food to a food bank?*
 - **The food has to come from within a 1 (or more)-mile radius of the school.**
 - a. *Can we get food from a fast-food restaurant?*
 - b. *Can we use the vending machines at school?*
 - **There is a limited budget for the food.**
 - a. *What is our budget?*
 - b. *Is the budget flexible?*
 7. Hand out one **Interview Worksheet** to each student. Give students about 10 minutes to get up and look at all of the sticky note questions on the board. Ask them to write down **5 questions** on their worksheet from the sticky notes that they think are **most important** for developing their design plan.

PART II: Asking questions (20 min.)

Note: The purpose of Part II of this activity is to give students experience interviewing others and getting insight into





the complexities of design problems. This exercise will be done as a full class, so it might get a bit noisy!

1. Give students about 15 minutes to walk around the classroom to interview **3 different people** using their 5 chosen questions, being careful to record responses on their worksheets. You will represent the 'school administrator' overseeing the party, and are also available for questions. (You can answer administrative questions however you want; just make sure to be consistent with your answers.)
2. After they have interviewed 3 different people, students should return to their seats and reflect on the activity (quietly and individually) by answering the Reflection questions on the back of their Interview Worksheet.

Wrapping up (10 min.)

1. Ask volunteers to share some of their thoughts from their reflections. Before you conclude this exercise, make sure students are on board with the importance of interviewing and asking questions in the design thinking process. Interviewing helps you to better understand the person or situation you are designing for and what the constraints or conditions of your design are.
2. Do you think any of the restrictions you were given in this exercise are issues that people face in their everyday food choices? Why or why not? (**Agree:** People have budgets and financial constraints, some people live closer to grocery stores than others, some people don't have a car or a way to get to easily get to a store, some people can't eat certain food due to religious practices or medical reasons. **Disagree:** Most people can travel more than a mile, you don't get to each your favorite food every day, etc.)

Next steps

Introduce your students to some of the issues surrounding our global food system in the next activity in this **Flipside Science** unit: **Exploring the Impacts of Feeding the World**

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.*

Additional resources

- [Design for Change design thinking for students: Feel-Imagine-Do-Share](#)
- [California Academy of Sciences Science News article: Food Stuff](#)
- [California Academy of Sciences Science News article: Early Human Diets](#)

