

A Real-life Choice

Objectives

Students will be able to understand they have the ability to reduce the amount of plastic packaging in their lives depending on the choices they make. They will also be able to discuss how difficult plastic-free shopping can be.

Introduction

Modern day packaging has been evolving since the late 1800's. Packaging has many goals. It must effectively deliver the product to the consumer intact and sometimes it must also help to sell the product. Producers prefer a packaging that is effective, cheap, lightweight (for low shipping cost), looks good, and makes their products look good. For these reasons, the popularity of plastic packaging has grown dramatically since plastic started to be used extensively during and after World War II. Today the majority of packaging of all types is now made of plastic, especially food. When shopping for groceries, it is nearly impossible to go through your shopping list without picking up items packaged in plastic. Walk students through understanding the tradeoffs associated with varied packaging of common grocery items. Then give students the power to make their own lunch decisions with the goal to try and purchase the most plastic-free lunch possible.

Next Generation Science Standards

Science and Engineering Practices

- Planning and carrying out investigations
- Developing and using models
- Using mathematics and computational thinking
- Analyzing and interpreting data

Crosscutting Concepts

- Cause and effect
- Scale, proportion, and quantity

Disciplinary Core Ideas

- ESS3.C: Human impacts on Earth systems
- ETS2.B: Influence of science, engineering, and technology on society and the natural world

Procedure

This activity has two tracks. **Track A** is an in-classroom activity which walks through a shopping simulation using a grocery store catalog. **Track B** is an optional activity if resources are available for a field trip to a local grocery store. Both tracks can also be combined into one lesson.

Track A

Track A Supplies

- The Grocery Store Catalog (**Appendix A**)

1. Let's Go Shopping! Provide students with *The Grocery Store Catalog (Appendix A)* and explain that they will be hypothetically shopping for their lunch today. Each student should try to make a meal including every food group in the *MyPlate Guide to School Lunch (Appendix B)* without going over their \$20 budget. Students may choose whichever foods they want (Sweets are optional). Have students share what they “bought” for lunch with a partner.

2. Plastic Audit. Once students have chosen their meals, have students tally up how many pieces of packaging they also bought. How many pieces of packaging were plastic? Have students compare and contrast each other's packaging counts. Keep these numbers.

3. Discuss. Discuss with students the reasoning behind plastic packaging and the benefits it allows us today. Ask students why they think we use plastic for packaging? (e.g., food safety and protection, long term storage, freshness, low cost transport, marketability, etc.)

- Review the Top 10 Items Collected on International Coastal Cleanup Day (2021) (**Appendix C**).
 - How many of the Top 10 are single-use plastic packaging?
 - Why do you think these are the most commonly found items? (e.g., very prevalent, lightweight, and easy to fly or float away, durability to last long, etc.)
- Ask students to think of ways to limit plastic packaging.
 - Common examples are bulk products (i.e., large quantities with less packaging), lightweight or reduced plastic packaging (e.g., reducing the size of bottle caps), switching materials (i.e., paper or glass instead of plastic), design changes (e.g. removing plastic see-through windows on pasta boxes).
- Ask students to brainstorm the tradeoffs of purchasing plastic-free items versus those that aren't. Have students think about factors such as convenience, freshness, preference, price, etc.
- For more activities exploring the most-collected items, check out [Talking Trash and Taking Action](#), a hands-on learning plan from the NOAA Marine Debris Program and Ocean Conservancy.

4. Plastic-Conscious Shopping. Have students “go shopping” again but this time with the goal to make their meal as plastic-free as possible. Tally up the total pieces of packaging and how many are plastic packaging. Students should try to recreate their original meal with different choices and compare their packaging totals with their original results. Have students share their meals, shopping lists, and package tallies with each other.

5. Discussion. Compare and contrast different meals and different choices made.

- Were you surprised at how much plastic packaging is present in grocery stores?
- Which foods had multiple packaging options and which did not?
- Is there a food group that used more or less plastic packaging than the rest?

- Were there items that used excessive amounts of plastic packaging? How could it be changed to require less packaging?
- Besides packaging, what other factors did you need to consider when shopping for your groceries (e.g., preference, ingredients list, budget, etc.)?

6. Assessment.

- Have students write (or draw, act, or otherwise communicate) a summary or narrative description of going to the store and making a meal plastic free.
- Have students write and illustrate a grocery guide to accompany the *MyPlate Guide to School Lunch* to help other consumers avoid plastic packaging while they shop.

7. Extension.

- Discuss issues of food security and justice with your students. How would food deserts or other food justice issues impact a person or community's ability to make the choices you practiced in the exercise? How does this reflect greater issues of environmental justice and intersectionality?
- Re-do the simulation to focus on healthy food options, lowest carbon footprints, or other challenges associated with grocery choices
- Create a public awareness campaign for your community focused on reducing plastic packaging and the connection between our consumer choices and urban trash/marine debris.
- Have students engineer packaging solutions using the engineering design process.

Track B

If your class is able to have an excursion to a nearby grocery store (i.e. has transportation, has enough chaperones, has funds for shopping expenses), follow the following procedures for a real life chance to make plastic free choices.

Track B Supplies

- Shopping list for each group
- 2 Shopping bags for each group
- Food Scale
- Adult chaperones

2. Set up. You will be taking students into a grocery store and having them buy their own lunches with the goal to buy the least amount of plastic packaging. Divide students into groups of 4-6 and assign an adult chaperone to go with each group through the grocery store.

- Using the *MyPlate Guide to School Lunch (Appendix B)*, have students create their own shopping list of ingredients to buy their group lunch with a budget of \$20. Shopping lists may need to change in real time depending on prices, but each group should purchase

something in each of the following food groups: vegetables, fruits, grain, protein, and dairy. Desserts are optional if their budget allows.

- Be sure to discuss with students field trip rules and how to behave in a grocery store.

3. Let's go to the store! Give each group a budget of \$20 to pick out ingredients to make their group lunch with the aim to have the least amount of plastic packaging possible.

- Have chaperones engage the group in discussion as they shop (i.e., Explain how there is a plastic tray inside packages of cookies, or that sliced cheese can be individually wrapped in plastic), but let students make the final decisions.
- Be sure to use your reusable bags at check out!

4. Weigh the plastic. When you return from the store, before eating anything, use the scale to calculate the weights of plastic that each group bought.

- Most packaged foods will list the product weight on the package. This means the packaging weight can be calculated from the total weight (total weight – product weight = packaging weight).
- For items with only partial plastic packaging, you may need to open or deconstruct the packaging first in order to weigh the individual pieces of plastic.
- Calculate each group's total plastic weights and see who had the least amount of plastic packaging in their meal.

5. Eat and Discuss! Have students make their lunch. While eating, discuss the excursion and the decisions that were made by each team.

- Were you surprised at how much plastic packaging is present in grocery stores?
- Discuss the decisions that were made by the winning team. Did they win by a lot or a little?
- Compare and contrast the choices made between groups.
- Discuss if students learned different choices from each other that they could have made to lessen their plastic consumption.
- Were there items that used excessive amounts of plastic packaging? How could it be changed to require less packaging?
- Is there a department that used more or less plastic than the rest?
- Were there foods that had multiple packaging options? Were there foods that did not?
- Besides packaging, what other factors did you need to consider when shopping for your groceries (e.g., preference, ingredients list, budget, # of people to feed, etc.)?

6. Assessment.

- Have students write, draw, act, or otherwise communicate a summary or narrative description of going to the store and making a meal plastic free.
- Have students write and illustrate a grocery guide to accompany the *MyPlate Guide to School Lunch* to help other consumers avoid plastic packaging while they shop.
- Create charts, graphs, or infographics using the data and any images collected from your trip.

7. Extension.

- Discuss issues of food security and justice with your students. How would food deserts or other food justice issues impact a person or community's ability to make the choices you practiced in the exercise? How does this reflect greater issues of environmental justice and intersectionality?
- Create an art installation, engineering project, or other project using the plastic packaging from your trip.
- Discuss possible tradeoffs and comparisons among shopping lists. What were the healthy food options, which items had the lowest carbon footprints, or other choices that were made throughout the experience?
- Create a public awareness campaign for your community focused on reducing plastic packaging and the connection between our consumer choices and marine debris.
- Have students engineer packaging solutions using the engineering design process.

Appendices:

- **Appendix A: The Grocery Store Catalog**
- **Appendix B: MyPlate Guide to School Lunch**
- **Appendix C: Ocean Conservancy's International Coastal Cleanup - Top 10 Item**



The Grocery Store Catalog

Plastic-free Lunch

Fruits



Apple slices
Wt: 14 oz
\$: \$2.99



Apple
5 oz
\$1.29



Banana
4 oz
\$0.79



Watermelon
10 oz
\$3.24



Grapes
32 oz
\$4.98



Bag of Apples
Wt: 32 oz
\$: \$5.99



Strawberries
16 oz
\$6.99



Peach Cup
4 oz
\$0.72



Canned Pineapple
20 oz
\$2.19



Kiwi
2.8 oz
\$0.99

Vegetables



Baby Carrots
Wt: 16 oz
\$: \$1.49



Lettuce
16 oz
\$2.09



Cucumber
12 oz
\$0.65



Cherry Tomatoes
10 oz
\$3.75



Guacamole
8 oz
\$3.15



Green Beans
16 oz
\$1.56



Tomato
Wt: 5 oz
\$: \$0.99



Broccoli Florets
12 oz
\$2.99



Corn
20 oz
\$4.49



Sweet Peppers
5 oz
\$1.20



Baby Bok Choy
16 oz
\$2.99

Grains



Sliced Bread
Wt: 20 oz
\$: \$3.99



Hot Dog Bun
12 oz
\$3.50



Burger Buns
12 oz
\$3.50



Pasta Noodles
16 oz
\$1.99



Instant Rice
7.5 oz
\$2.29



Bakery Bread
Wt: 16 oz
\$: \$4.50



Crackers
14 oz
\$3.50



Granola
14 oz
\$3.99



Tortillas
16 oz
\$2.29



Tortilla Chips
15 oz
\$3.00



Instant Ramen
3 oz
\$0.59

Protein

The Grocery Store Catalog

Plastic-free Lunch



Peanut Butter
Wt: 16 oz
\$: \$3.50



Tuna
5 oz
\$1.20



Chicken Nuggets
29 oz
\$6.69



Eggs
12 oz
\$3.75



Hamburgers
16 oz
\$8.50



Tofu
16 oz
\$2.39



Trail Mix
Wt: 8 oz
\$: \$5.50



Almond Butter
12 oz
\$4.98



Hot Dogs
16 oz
\$4.50



Pinto Beans
16 oz
\$1.15



Fresh Deli Meat
16 oz
\$7.99

Dairy



Whole Milk
Wt: 1 gal
\$: \$3.99



Assorted Cheese Slices
16 oz
\$6.50



2% Milk
0.5 gal
\$2.29



American Cheese Slices
12 oz
\$3.50



Yogurt Cup
5.3 oz
\$1.29



Chocolate Milk
Wt: 1 qt
\$: \$2.99



Cheddar Cheese Block
8 oz
\$3.75



Cheese Sticks
12 oz
\$4.65



Soy Milk
0.5 gal
\$3.99



Ice Cream
1 pint
\$5.50

Sweets



Cookies
Wt: 13 oz
\$: \$3.99



Lollipops
0.02 oz
\$0.10 ea.



Chocolate Bar
1.5 oz
\$1.50



Bakery Donut
1 oz
\$1.20



Brownie Tray
13 oz
\$4.48



United States Department of Agriculture

MYPLATE GUIDE TO SCHOOL LUNCH

for Families

GRAINS  Whole grains give kids B vitamins, minerals, and fiber to help them feel fuller longer so they stay alert to concentrate at school.

VEGETABLES  A variety of vegetables helps kids get the nutrients and fiber they need for good health.

MILK  Low-fat (1%) or Fat-free milk. Children and teens need the calcium, protein, and vitamin D found in milk for strong bones, teeth and muscles.

PROTEIN FOODS  Meat, poultry, fish, dry beans, peas, eggs, nuts, and seeds provide many nutrients including protein and iron. Portion sizes are based upon the nutrition needs of children in various grade groups. School meals also allow cheese, tofu, and yogurt to count as the meat/meat alternate in the school lunch.

FRUITS  Every school lunch includes fruits as well as vegetables. Only 1/2 of the fruits offered may be 100% juice, since whole and cut-up fruits have more fiber.



Visit teamnutrition.usda.gov for additional tips and activities.



Ocean Conservancy's International Coastal Day Cleanup Top 10 Items (2021)

