**The relationship between agriculture and lifestyle**

Pillar 4 A. Discover that there is a cost associated with producing and purchasing food (Grades 4th -8th)

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| **Website**: <https://www.agclassroom.org/teacher/matrix/lessonplan.cfm?lpid=548&search_term_lp=Grocery%20Store%20Problem%20Solving> <https://www.agclassroom.org/teacher/matrix/lessonplan.cfm?lpid=546> **Hands On**: Mock meal budgeting activity <http://www.agclassroom.org/northdakota/matrix/lessonplan.cfm?lpid=548>  |

**Grocery Store Problem Solving**

**Purpose**

Students will use basic mathematical skills to solve problems related to the cost of food while integrating geography and nutrition to enhance learning. Activities include analyzing grocery ads, assessing the nutrition and cost of meals, and exploring diets around the world.

**Materials**

**Activity 1**

* Grocery advertisements, full or partial section for each student
* *MyPlate* *Illustration*, made into display or handout

**Activity 2**

* Scissors, tape and glue
* One dinner-sized white paper plate for each student

**Activity 3**

* *Feeding the World* Powerpoint
* Peter Menzel’s *[Hungry Planet Family Food Portraits](http://menzelphoto.photoshelter.com/gallery/Hungry-Planet-Family-Food-Portraits/G0000zmgWvU6SiKM/C0000k7JgEHhEq0w%22%20%5Ct%20%22_blank)*
* Globe or world map

**Activity 4**

* Extra paper for math computations

Essential Files (maps, charts, pictures, or documents)

* [Feeding the World PowerPoint](https://naitc-api.usu.edu/media/uploads/2017/02/03/feeding_world_ppt_1.ppt%22%20%5Ct%20%22_blank)
* [MyPlate Illustration](https://naitc-api.usu.edu/media/uploads/2017/01/20/my_plate.pdf%22%20%5Ct%20%22_blank)
* [Understanding MyPlate](https://naitc-api.usu.edu/media/uploads/2017/01/20/Understanding_MyPlate_1.pdf%22%20%5Ct%20%22_blank)

**Vocabulary**

**Minimally processed foods:** foods are changed only a small amount between the farm and the consumer; these foods have few ingredients (often only one) but might be washed, peeled, sliced, juiced, frozen, dried, or pasteurized

**Highly processed foods:** foods that have many ingredients and are mostly or fully prepared in the factory so they require little or no preparation before eating

Background Agricultural Connections

Grocery store advertisements that typically come in the weekly mail are a great way to integrate mathematics, nutrition, geography, economics, and general finance. So before you recycle the next batch, consider bringing them into the classroom and doing “real world” problem solving.

**Interest Approach – Engagement**

1. Ask 3-5 students volunteers to come to your board and write down their favorite food. (encourage students to pick a simple, whole food)
2. Next, challenge the student to list the journey the food takes from the farm where it is produced to the grocery store where it is purchased. Allow students to work together with their classmates to accomplish this task if needed.
3. As you review the path each food follows, use questions such as the following to stimulate discussion:
	* "When is the food product purchased?" *(It is purchased on each level. The farmer sells to the processor, the processor sells to the grocer.)*
	* *"*Are all food products produced on a farm?" *(Yes)*
	* What factors might make a food more/less expensive? *(The level of demand for the food product, the distance it traveled from the farm where it was produced, or the overall cost of the farmer producing it.)*

**Procedures**

**Activity 1:Taking a Closer Look**

1. Give each student either a partial or complete section of grocery ads.
2. Have the students identify how many items are listed in “cents” or say something similar to “under a dollar.” Students should use tally marks to keep track of the number of these “under a dollar” items.
3. Ask the students, “Of the number of items you tallied, are there more items that are food items or non-food items that are under one dollar?” (Tip: Teachers can use “greater than” or “equal to” depending upon the students understanding of these terms.)
4. Explain to students the difference between raw or minimally processed and highly processed foods. Use the grocery ads to select some specific examples of each. It may also be beneficial to show the students a nutrition label to help them understand where the nutrition and ingredient information is found.
5. While still working with the “under a dollar” items, ask the students if there are mostly raw/minimally processed (including foods like milk and eggs) or mostly processed food items that are under one dollar (e.g., macaroni and cheese, instant muffin mixes, canned ravioli).
6. Ask the students to find the most expensive item in their grocery ad. Have them draw a square around that item. Draw a simple chart on the board and have them call out their most expensive items and the prices. Determine whether the most expensive items were generally food or nonfood items.
7. Ask the students to examine their grocery ads further and select two snacks. One snack should be raw or minimally processed and the other snack should be highly processed. Have them cut out the items.
8. Project the *MyPlate Illustration* on a clean whiteboard. Explain to the students how MyPlate can help them make healthy food choices. (See the attached *Understanding MyPlate* for more information.)
9. Give each student two small pieces of tape. Have them place the tape on the back of their two snack choices.
10. Ask the students to come up to the whiteboard and place their snacks in the correct food group. Note that some foods fit into certain food groups, but should only be eaten occasionally. For example, ice cream fits in the Dairy group, but it should not be considered a dietary staple.

**Activity 2: Fill Your Plate**

1. Give each student a dinner-sized paper plate.
2. Using the grocery ads from the previous activity, have the students circle the items they would like to have for their next meal.
3. Ask the students to write down all of the costs for their meal on a separate paper.
4. Have the students cut out these foods and glue them to their paper plates (students may include drinks on their plates).
5. Tell the students to identify which food groups are present on their plates. Find out which student has the most fruits and vegetables.
6. If there are a number of students without any fruits and vegetables or low-fat dairy products, ask them what other foods they could include from their ad to make their meal more nutritious. Have them cut out these items and include them on their plate. The students should also include the costs of these foods on their separate piece of paper.
7. Have the students add up the total cost of their meal.
8. Find out which student has the most expensive meal and the least expensive meal. Ask the students what they think was the reason one meal was the most expensive; why was one meal so inexpensive?

**Activity 3: Eating Around the World**

1. Download the *Feeding the World* PowerPoint presentation, and share it with your students. When you reach slide 13, share some of the photographs from the book *The Hungry Planet* by Peter Menzel. These photographs display what families from locations all over the world will eat in one week. They are available at the [Peter Menzel Photography](http://menzelphoto.photoshelter.com/gallery/Hungry-Planet-Family-Food-Portraits/G0000zmgWvU6SiKM/C0000k7JgEHhEq0w%22%20%5Ct%20%22_blank) site or for purchase as posters from the [Social Studies School Service](http://catalog.socialstudies.com/c/product.web?nocache@1+s@hpIXFmT53Dllk+record@TF39905+Title@HUNGRY+PLANET+ISBN@9781560045229" \t "_blank).
2. Show the students these pictures and ask them to compare and contrast the foods they have just explored in their grocery ads and added to their plates.
3. Locate each family’s resident country on a globe. For younger students, you may want to ask them if it is near or far from where they live. For older students, you may want to have them determine hemispheres or ask them to identify oceans or major continental landmarks that would help to determine the climate and geography of that location.
4. Ask the students if more or fewer of the foods in the pictures are packaged. Why would a food be packaged? (foods will be grown in areas based upon climate and geography and shipped to other locations)
5. Ask the students if more or fewer of the foods are raw or minimally processed. What does that tell us about how much time the families spend cooking their food? Ask your students if they have ever cooked their own meal or helped an adult cook a meal. You may want to explain that some countries eat more raw and/or minimally processed foods because their countries lack good roads and forms of transportation to bring in more processed foods. They may also lack electricity and/or running water. Ask the students what they would eat if they didn't have any electricity to use a stove, refrigerator, or microwave.

**Activity 4: Real World Math**

1. Give each student just one page of grocery ads. Have each student circle the prices of five items on the page. Ask the students to round prices up to the nearest dollar on each of those items. Have them write own their answers on a separate sheet of paper.
2. Using the numbers the students just rounded, have students determine how much the item would cost if it were “50% or 1/2” off. Teachers could expand this activity depending upon the level of students’ understanding.
3. Have the students locate a “multiples deal” in their grocery ad (e.g., 10 for $10, 5 for $10, or 3 for $4). Have them determine the “real cost” of a single item.
4. As a class, have the students select a produce item like bananas or apples. Write the price listed from the ad on the board. Tell the students that they have $5 to purchase the product. Use the following questions to solve problems and make food-related decisions (teachers should modify the wording of the questions based upon the produce item selected by the students).
5. As a class, choose a sandwich item from the grocery ad, such as peanut butter. Write the price listed from the ad on the board. Tell the students that a competing brand at the store sells for three times the cost of this product. Use the following questions to solve problems and make decisions (teachers may need to modify the wording to accommodate the grocery ad selection).
	* How much will it cost to buy two bunches of bananas?
	* If you purchase two bunches of bananas, how much money will you have left over?
	* If you have a coupon for 20% off of each bunch of bananas, how much will you save?
	* How much more does the competing brand cost?
	* If you have $9, and one loaf of bread costs $1.25, can you purchase the more expensive item and the bread? If not, how much more money would you need? If so, how much do you have left over for other items?
	* What are some other things to consider (besides price) when choosing which brand of peanut butter to buy?

**Concept Elaboration and Evaluation**

After conducting these activities, review and summarize the following key concepts:

* Agriculture is important to our daily life because it provides food to keep our bodies healthy.
* The final cost of a food item represents the cost of the farmer producing it, the food being processed and packaged for retail sale, and the transportation of the product.
* The cost of food follows the rules of supply and demand.

**Suggested Companion Resources**

* [Be Label Able WebQuest](http://www.agclassroom.org/northdakota/matrix/resources.cfm?rid=37) (Activity)
* [Fill MyPlate Game](http://www.agclassroom.org/northdakota/matrix/resources.cfm?rid=382) (Activity)
* [Supply and Demand](http://www.agclassroom.org/northdakota/matrix/resources.cfm?rid=46) (Activity)
* [Food Models](http://www.agclassroom.org/northdakota/matrix/resources.cfm?rid=29) (Kit)
* [MyPlate Activity Poster](http://www.agclassroom.org/northdakota/matrix/resources.cfm?rid=600) (Poster, Map, Infographic)
* [The Power of Choice Bulletin Board](http://www.agclassroom.org/northdakota/matrix/resources.cfm?rid=726) (Poster, Map, Infographic)
* [Hungry Planet Resources from Social Studies School Service](http://www.agclassroom.org/northdakota/matrix/resources.cfm?rid=691) (Teacher Reference)
* [Food-A-Pedia](http://www.agclassroom.org/northdakota/matrix/resources.cfm?rid=429) (Website)
* [Hungry Planet Family Food Portraits](http://www.agclassroom.org/northdakota/matrix/resources.cfm?rid=703) (Website)