

“You Are What You Eat”: A Nutritional and Cultural Analysis of the Foods We Eat

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Overview

From its inception, nutritional programs targeted towards school age children in the United States have sought to convey to students what good food choices look like, taste like, and the physical impact of these choices on general health. What is not specifically addressed is what happens inside the body that leads up to the manifestation of illnesses connected with the absence of nutrition. This unit will examine illnesses in the body linked to deficiencies of a variety of dietary vitamins and minerals. Additionally, we will examine multiple world culture groups and how access to particular foods influences food choice, and as such, impacts the intake of certain nutrients, and the omission of others. In exploring themes of culture, food accessibility, and illness linked with nutrition deficiency through text and the identification of life experiences relevant to those topics, this unit seeks to encourage students to create a view of the role nutrition plays in the everyday lives of people on a global scale – and its impact on how our bodies function. Students will interact meaningfully with provided texts and will be prompted to respond to these externalities as a means of identifying the role of food as it applies to the maintenance of proper cellular function, as well as how the metabolic process works.

Rationale

It is widely known that dietary choices are directly linked to all aspects of our growth and development as children; factors which go on to have direct ties to our levels of health as adults. However, what is not often conveyed to the age group of students this unit seeks to educate, is what these choices look like at the cellular level, and how the lengthy omission of various nutrients in one’s diet inhibits proper function of each of our cell’s components; therefore compromising their structure, function and integrity. Hopefully, by understanding how various nutrients in one’s diet can promote the health of cells, students will develop an appreciation for how the health of our overall being can be affected by everyday choices, and thus in the spirit of personal responsibility will be more proactive in making their choices the “right” ones. Also, in an effort to promote

global awareness as it applies to food and nutrition, this unit will examine a variety of other cultures, the nutrition deficiencies most prevalent within them and causes of the deprivation.

Objectives

This unit is intended for use with students in an inclusive sixth grade Science classroom in a middle school setting. They spend 75-90 minutes daily in Science class. By the end of this unit, students will be able to:

- Define and explain the metabolic process as it relates to carbohydrates, proteins, lipids, alcohol, vitamins, minerals, water, and dietary fiber
- Use the caloric values of energy-yielding nutrients to determine the total calories in a food or diet.
- Explore the processes within the body that take place in the digestion of various nutrients.
- Identify dietary factors that contribute to various causes of illness and death.
- Describe how various factors affect our food habits: size and composition, early experiences, ethnic customs, health concerns, advertising, social class, and economics.
- Explore the importance of labels, and the scientific work that is involved behind labeling and the propaganda techniques used in marketing.

Strategies

Students will engage with scientific texts in a variety of Before-During-After (BDA) activities. The activities will be differentiated to include all learning levels and to address as many learning styles and modalities as possible. Likewise, collaborative activities will include high/low pairing (the pairing of more advanced students with students at lower levels of learning). Specifically, students will participate in inquiry-based activities to further their understanding of concepts taught in the unit. When possible, teacher will employ the use of visual cues (illustrations, diagrams, etc.) to further student understanding of concepts. The activities students are to participate in include a variety of in-class labs, extended research activities, and a culminating project. Additionally, students will keep a science journal to encourage reflection, interpretation and analysis.

Classroom Activities

Lesson # 1: Testing for Carbohydrates

Length: One 90-minute class period

Rationale: Carbohydrates provide energy for the body. Your body need more carbohydrates than fats and proteins each day. Foods that contain starch and foods that contain sugar are sources of carbohydrates.

Objectives:

- a. Students will analyze test results to determine which foods are sources of carbohydrates.

Materials: bread, egg white (hard-boiled), forceps, glucose, honey, iodine in dropping bottle, labels, milk, molasses, potato (cooked), rice (cooked), starch, sugar tests tablets, syrup, test tube rack, 12 test tubes, water, data table

Procedure:

1. Label 6 test tubes 1 through 6. Place them in a test tube rack.
2. Fill the test tubes to about 1 centimeter with the following: water, starch, bread, rice, egg white, potato
3. Add 5 drops of iodine to test tubes 1-6. Examine the color. A blue-black color means the starch is present. Record the colors in data table (to be provided).
4. Label the remaining test tubes 7 through 12. Place them in a test tube rack.
5. Fill these test tubes to a depth of about 1 centimeter with the following: water, glucose, syrup, honey, milk, molasses,
6. Use forceps to add one sugar test tablet each to test tubes 7-12.
7. Observe the color of each of the test tubes. Green, yellow, or orange color means that sugar is present. Record the colors in provided data table.

Student Product:

1. Which foods tested showed starch present? Explain how you know.
 2. Which foods tested showed sugar present? Explain how you know.
 3. Why was water tested for both starch and sugar?
 4. Which foods are carbohydrates? Explain how starch and sugar are related.
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Lesson # 2: Digestion of Fats

Length: One 90-minute class period

Rationale: Did you know that a chemical compound in your liver performs a job much like you teeth? It helps to break down fats and oils so that digestion can occur more easily. Eventually, the fat and oil are changed into a form that can be used by the body for energy.

Objectives:

- a. Through analysis students will determine if fats mix with water.
- b. Students will determine if chemicals help to mix fats with water.
- c. Students will determine what substances can best break down vegetable oil (fat), and how this action is related to the human digestive system.

Materials: alcohol, bile, 5 droppers, labels, lemon juice, liquid detergent, metric ruler, newspaper, 5 stoppers to fit test tubes, test tube rack, 5 test tubes, vegetable oil, data table

Procedure:

1. Use tape to label five test tubes 1-5 and put in rack.
2. Add water to a height of 4 cm.
3. With dropper, place four drops of vegetable oil into each test tube. Observe whether the oil remain on the top or bottom of the water. Record your observations in provided data table. Record if the line between the oil and water is sharp or fuzzy.
4. Add the following to individually labeled test tubes, using a different dropper with each: nothing more, 5 drops alcohol, 5 drops bile solution, 5 drops lemon juice, 10 drops liquid detergent
5. Stopper each test tube and shake vigorously 5 times.
6. Replace the tubes in the rack and allow them to remain undisturbed for ten minutes. After ten minutes, examine each tube. If a mixture is cloudy, some of the fat has broken down and mixed with the water. To determine which mixtures appear cloudy or clear, hold each test tube in front of a sheet of newspaper. You can make your decision based on how distinctly you can see the newspaper through each solution. To determine relative cloudiness, compare each tube to Tube 1 by holding both tubes against the newspaper print background at the same time.
7. Record your results in the data table.
8. Some oil will remain on top of the water in each test tube. Determine whether the line that forms between oil and water is sharp or fuzzy. Record answers in table.

Student Product:

(Data and Observations)

1. What is the appearance of the oil and water in each test tube before you add anything else?

(Questions and Conclusions)

1. Does water mix with fats (oils)?
2. Using the information on the table, how can you tell if fats (oils) are broken down so that they mix with water?
3. How can you tell if fats (oils) are not broken down and therefore do not mix with water?
4. Which chemicals caused the oil break down the most?
5. Which chemicals caused a fuzzy line of separation between the oil and water?
6. Which chemical(s) used is (are) not produced by the human digestive system?
7. (a) Which chemical(s) is (are) produced by the human digestive system? (b) What is the function of those chemicals in our digestive system? (c) Did these chemicals perform in a similar way when used in a test tube containing fat (oil)? Explain.
8. What caused the mixing of oil and water in test tube 3?
9. Is oil denser than water? How do you know?
10. Why is detergent useful for washing grease from clothes?

5. What conclusion can you make about the number of Calories in a gram of protein as compared to the number of Calories in a gram of fat?
 6. Why is protein needed by the body?
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Lesson # 4: Effects of Caffeine

Length: One 90-minute class period

Rationale: Caffeine, found in coffee, tea, cocoa, and some carbonated drinks, is a stimulant. Caffeine speeds up the rate of the body's activities while it increases alertness and reduces fatigue. However, caffeine can cause nervousness and it can be harmful to people who have heart disease or ulcers. Caffeine also affects other organisms. It is now being considered as a pesticide. In doses equal to the amount contained in ten cups of strong coffee, caffeine slowed the growth of several species of pests and, at higher doses, killed the insects within days. In this activity, you will observe how caffeine affects the protist *Euglena*.

Objectives:

- a. Students will compare the effects of different caffeine products on *Euglena* and infer how caffeinated products can affect more complex organisms (i.e. humans).

Materials: cocoa, cola, coffee, 5 coverslips, 5 droppers, *Euglena* culture, microscope, 5 microscope slides, tea

Procedure:

1. Place a drop of the *Euglena* culture on a clean microscope slide. Add a coverslip. Examine the *Euglena* under low and high power of the microscope. Record your observations in your data table. This slide will be the control for your experiment.
2. Prepare a second *euglena* slide by adding a drop of coffee at the outer edge of the coverslip. Use a small piece of paper towel to draw the coffee under the coverslip (as show in illustration to be provided to students). Observe the activity of the *Euglena* under both low and high power. Record observations in data table.
3. Use a clean microscope slide and coverslip to prepare a third slide. Ass a drop of tea at the outer edge of the coverslip and use a small piece of paper towel to draw the tea under the coverslip. Observe the *Euglena* and record your observations in the data table.
4. Prepare a fourth slide using a clean slide and coverslip. Add a drop of cocoa at the outer edge of the coverslip. Again, use a small pieve of paper towel to draw the cocoa under the coverslip. Observe the *Euglena* and record your observations in the data table.
5. Using a clean microscope slide and coverslip, prepare a fifth slide. Add a drop of cola to the outer edge of the coverslip. As in steps 2-4, use a piece of paper towel to draw the cola under the coverslip. Observe the *Euglena* and record your observations in the data table.

Student Product:

(Data and Observations)

1. Complete data table using your observations of the Euglena slides.
2. Using your observations, rank slides 2-5 according to the level of activity to the level of activity shown by the Euglena. Let the slide with the lowest level of activity be Number 1. Record this information in the table.

(Questions and Conclusions)

1. Which solution affected the Euglena to the greatest extent? How do you know?
 2. Which solution affected the Euglena least?
 3. Which solution probably contains the most caffeine?
 4. From your observations, can you determine that caffeine is a stimulant? Explain.
 5. Caffeine is found in large amounts in many plants. How could this affect the number of insects that attack these plants?
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Lesson #5: Effects of Nicotine

Length: Two 90-minute class periods

Rationale: Most of the tobacco that is smoked comes from a plant with the scientific name *Nicotiana tabacum*. The species name is a clue for the common name, tobacco. The genus name gives a clue that the chemical nicotine is found in tobacco. Nicotine is a drug that affects the nervous system.

Objectives:

- a. Students will compare and contrast the behavior of organisms (fish) in water that contains nicotine, versus those exposed only to plain water, and analyze the effects.

Materials: 3 beakers (400 mL), cigarette dropper, graduated cylinder, 2 guppies, tape, test tube, water (aged 3 days)

Procedure:

1. Remove the paper covering and filter (if present) from a cigarette and place the tobacco into a test tube. Add 10 mL (about half a test tube) of water to the tobacco and allow it to soak in the water for several minutes. This will serve as your source of nicotine.
2. Place two guppies of about equal size into two 400 mL beakers, each half-filled with aged water. Allow the fish to adjust to their new environment by leaving them undisturbed for several minutes.
3. Use a strip of tape to place a line along the side of each beaker. The line should run from top to bottom.
4. Use a dropper to remove the liquid (nicotine) from the soaking tobacco. Add 20 drops of nicotine to one of the beakers.
5. Wait several minutes before comparing the activity of the fish with nicotine to the fish without nicotine. To help you judge any difference in activity, the line on

- each beaker may be helpful. If a fish passes the line while you look in the beaker, count this as a crossing. It makes no difference from what direction the fish passes the line. It may be swimming toward the back of front of the beaker. If you see the fish pass the line, count it as a crossing.
6. Count the number of crossings for each fish in both beakers during one minute.
 7. Record the counts in the data table. Continue to run 5 trials each for a period of a minute.
 8. Remove the fish from the nicotine solution and place it in another beaker half-full of clean aged water. Total and then average your results.

Student Product:

(Data and Observations)

** To be filled out in data table

(Questions and Concerns)

1. Which fish had more average crossings for one minute?
2. Explain what counting the number of crossing attempt to show.
3. Do guppies in nicotine show a stimulated type of behavior? Explain.
4. In an experiment such as this, can the conclusion be drawn that because chemical causes an observed change in fish, the chemical causes the exact same changes in humans? Why is it difficult to obtain results of how chemicals affect humans?

Additional activity: Students will view a bar graph showing interesting data connecting heart disease with smoking. (Royal College of Physicians of London, 1962) Students will then respond to the following:

5. According to the graph:

(a) Which group shows the least number of deaths for one year?

(b) The most deaths for one year?

© Does the graph show that those who stopped smoking can improve on the chance of having less coronary disease than those who have not stopped smoking? Use specific numbers to explain your answer.

(d) Does the amount of smoking each day affect the number of deaths resulting from coronary disease? Use specific numbers to explain your answer.

6. A person repeats the activity you did but makes the following change. First, the fish is placed in plain water and observed. Then the same fish is observed in a beaker of nicotine and water. Explain why this may be a better method for conducting the experiment.

Lesson # 6: Back to Basics

Length: Three 90-minute class periods

Rationale: Students will learn that nutrients play specific roles in the body, and that some foods contain high quantities of particular nutrients. During their exploration, students

will learn that a diet with inadequate amounts of nutrients can lead to disease and diminished health.

Objectives:

- (a) Students will be able to analyze different diets to understand the nutrients needed to maintain health and to identify nutrient deficiencies that lead to specific diseases.
- (b) Students will be able to explain what nutrients do in the body and describe the health risks posed by a deficiency of these nutrients.

Materials/Preparation: Prior to beginning the activity, each student will record everything he or she ate on one day, computers with Internet access, science lab, student sheet, nutrient-deficient diets information sheet for each pair of students, documentary “Prescription for Survival”

Procedure:

Activity # 1 (Day One)

Before watching the documentary “Prescription for Survival”, students will be shown a presentation that will facilitate a discussion of the following questions:

- What does the term, nutrient, mean? -What are the general categories of nutrients? (Nutrients are chemical compounds the body uses for energy or growth. The main nutrient categories are fats, proteins, carbohydrates, vitamins, and minerals.)
 - What are the roles of carbohydrates, proteins, and vitamins in the body? (Carbohydrates and fats are the body’s main source of energy. Proteins are primarily used in the body’s growth and development, as are vitamins and minerals. Vitamins and minerals are also important in cellular chemistry.)
 - In what ways does the body benefit from eating a healthy diet? A healthy diet provides sufficient nutrients to meet the body’s energy and growth needs.
 - What are some consequences of eating an unhealthy diet over a long period of time? (Malnutrition is one result of eating an unhealthy diet. Malnourished people lack one or more necessary nutrients—there can be too few calories, too little protein, or not enough of an essential vitamin or mineral. Obesity is another result of eating an unhealthy diet. People who overeat are prone to health risks associated with obesity, including high blood pressure, diabetes, and coronary heart disease.)
- *** Students will be encouraged to distinguish between nutrition problems characterized by deficiencies versus excess.

2. Prior to the day’s lesson, students will have collected nutrition labels from food containers. In class, students will note the components of food—fats, proteins, carbohydrates, vitamins, and minerals— and the recommended levels for each component. Teacher will ask students how often their food choices are influenced by the guidelines on nutrition labels.

Student Product:

3. After watching the documentary “Prescription for Survival”, students will work in

collaborative groups to do the following:

-List some of the challenges to improving the nutrition of a malnourished population. Identify which ones have solutions that could be implemented immediately.

-What are challenges to improving the safety of the water supply? Identify which ones have solutions that could be implemented immediately.

-“Prescription for Survival” explores the challenges individuals and populations face to maintain a healthy diet. Good nutrition is complex. The amounts of calories, proteins, carbohydrates, fats, vitamins, and minerals need to be balanced. Too much or too little of a nutrient can interfere with critical processes within the body, which can lead to disease. Students will write a paragraph about how viewing the documentary has affected how they think about the foods they eat, the water they drink, and their diet in general.

(Post-Documentary)

Activity # 2 (Day Two)

Materials: student list of daily diet, student sheet (Part 1), computer with Internet access (mypyramidtracker.gov),

Procedure:

1. Prior to beginning the activity, each student will list the foods and amounts he or she ate over the course of one day. This can be an actual list or estimated one of typical foods.
2. Distribute the student sheet describing Part 1. To elicit student ideas of the relationship between nutrition and health, groups will discuss the five questions in step 1. After 10 minutes, we will discuss these questions as a class.
3. Have students answer questions 2 and 3 on the student sheet. After five minutes, discuss these questions as a class.
4. To complete the rest of the activity, students need to use a computer with Web access, and will create an account on mypyramidtracker.gov that will allow them to save their entries.
5. With students in front of a computer, they will use MyPyramid to analyze their own diets by completing steps 4 and 5 on the student sheet. Step 5 describes how to log in, enter foods, and identify a food’s nutritional components (students may need assistance finding foods in the MyPyramid database and determining serving sizes—teacher will provide assistance if necessary).

Activity # 3 (Day Three)

Materials/Preparation: student sheet (Part 2), student sheet (Part 3), poster board, various other presentation materials

Procedure:

1. Distribute the student sheet describing Part 2. Following the steps in steps 3–7, students will analyze how well their diets comply with the USDA recommendations.
2. Teacher will discuss student answers to questions 3–7. As a class, on the board, we will list the nutrient deficiencies identified by the class, the role these nutrients play in the body, and the health risks associated with deficiencies. (Example of questions to be asked verbally, to facilitate discussion: What are the most common nutrient deficiencies found in the daily diets of the class? What kinds of foods would address these deficiencies?)
3. Teacher will distribute the student sheet describing Part 3 and the Nutrient-Deficient Diets Information sheet. So that all four diets on the sheet will be analyzed, teacher will make sure that at least one student or student pair analyzes each diet. Each diet is deficient in one particular nutrient and corresponds to one of the four diseases listed on the sheet. The student sheet guides students through determining which nutrient is missing from a diet and identifying the disease a person regularly consuming this diet may acquire.
4. In a class discussion, students will share their analysis of the nutrient-deficient diets, including their strategy for remedying the diet. Teacher will list their recommendations on the board and discuss which ones can reasonably be implemented.

Student Product:

1. Culminating activity: As a summative assessment, students will summarize their findings by preparing a poster or brief presentation. (Elements that should be part of this presentation will be outlined and given to students—along with a rubric)

Lesson # 7: International Involvement

Length: Two 90-minute class periods

1. Rationale: One of our most overlooked resources is water. We can survive for a few weeks without food, but only a few days without water. Having clean water to drink is a luxury. The water that eventually comes out of our faucets often did not start off being safe to drink. In most cases, it has gone through a water treatment plant designed by engineers prior to reaching our faucets. Is the Water Clean Yet? How hard can it be to clean dirty water? Students will find out by designing, constructing, and testing a water filter. (Activity type: Engineering challenge. Duration: 60 minutes. Preparation time: 30 minutes.)

Objectives:

- (a) Identify challenges in the clean water system.
- (b) Understand how filtration works and problem solve through the designing of filtration methods.

- (c) Identify the challenges of a public healthcare system, assess cost and demand, and prioritize available funding.
- (d) Identify organizations that are taking action on the food problem.
- (e) Analyze the causes and consequences of a corporate food system.

Materials/Preparation: water filter materials (1 liter of water, cotton balls, gauze squares, tulle.netting, tissue, paper towels, coffee filters, gravel, sand, 3 test tubes per group, test tube racks, graduated cylinders), design components worksheet

Procedure:

(Before the Activity)

- Teacher will make the liter of dirty water and the "A," "B," and "C" tubes.

(With the Students)

1. Tell the students they have been hired by (Your last name) Water Supply. There has been a drought and there is little water for all the things we need to supply – people, animals and plants. Tell them that they will each be given a sample of the dirty water they have remaining, and show them the tubes "A," "B," and "C". A is nearly ready for human use, B is nearly ready for animal use, and C is nearly ready to feed the plants. Remind them that no one must taste anything in the lab. They will be paid for their supply of filtered water: A gets \$10 per ml, B gets \$5 per ml, and C gets \$1 per ml.
2. Have students complete the [Design Components Worksheet](#) to make sure they understand the purpose of the activity, and to help them think about the components of engineering design.
3. Put trays of materials in front of the students. Let them decide in teams what materials they would like to use to filter their water. To challenge students, include one of the following constraints:
 - Limit the amount of materials allowed for the design.
 - Assign a price per unit of material and give students a budget to work within.
4. Have students draw schematics of the layers. Once completed, they can receive 25 ml of the dirty water and begin filtering it into their test tubes.
5. Once filtering is complete, they will bring test tubes to the teacher for observation. Teacher will decide if the water is A, B, or C grade and help them measure their sample in a graduated cylinder. They must return to their desks and do the math to come up with their \$ value.

Student Product:

1. Students will put their \$ values on the board.

Activity # 2 (Day Two)

Materials/Preparation: computer with Internet access, “Investing Your Money Wisely” student outline sheet, “Unfair Race” student outline sheet

Procedure:

1. Investing Your Money Wisely: If you were advising a government on how to spend its limited healthcare budget, how would you keep the largest possible number of people healthy? In this activity, students will decide which public health measures should be put in place first. Students will receive outline sheet listing all requirements. Students will be divided into teams and will debate their points. (Activity type: Debate. Duration: 30 minutes. Requires a table. Preparation time: 15 minutes.)

2. Unfair Race: How much of an impact does where you live have on your health? Players assume the roles of different countries and examine the extent to which one's country can help or hinder one's health. (Activity type: Group experience. Duration: 15 minutes. Preparation time: 30 minutes.)

Student Product:

Students' responses to the questions on the student sheet should incorporate the points discussed. In addition, the following will be considered while assessing student work:

1. Supported the team by contributing to the discussion, listening to others' ideas, discussing a variety of views, and helping the team develop a consensus.
2. Devised a thoughtful strategy to supplement the diet of a malnourished population to prevent nutrient-related diseases.
3. Demonstrated an understanding of the connections between nutrition and health and the challenges associated with providing nutritious diets and clean water to all people.

Lesson # 8: Food As A Problem

Length: One 90-minute class period

Rationale: Students will explore the relationships between food, justice, and health. During this lesson, students will analyze the topic of food security and develop an understanding of how the environments in communities, homes, stores, etc. affect what they eat. They will also explore the relationship between cost and accessibility of food in communities.

Objectives:

- (a) Identify challenges certain people and communities have to food access.
- (b) Articulate the history of food in North Philadelphia.
- (c) Identify problems in the food system.
- (d) Identify organizations who are taking action on the food problem.

Materials/Preparation: food system diagram handout, Meatrix video, 8 food narratives, 3 organization case studies

Procedure:

1. Meatrix Videos:

- (a) Students will watch 3 short videos are all about the process that food goes through before it lands in our refrigerator. Another way to think about this is, what does this food product's life look like? Where was it born? Who raised it? How did it get here?
- (b) Discussion questions: Think about the food you eat—do you know where it comes from? How is it made? Where does the meat come from that you get from McDonald's, etc.?
- (c) Videos Meatrix 1-3 will be played back to back
- (d) Teacher will then transition teams into team discussions.
- (e) Teacher will debrief the videos with their students. Debrief questions: What is the Meatrix? What were some problems that the videos named? Who or what caused this problem? What are consequences of the problem?
- (f) Each team should write down the answers to these questions in their journals.

2. Food Systems:

- (a) Students will be divided into teams
- (b) Each team will receive a case study about an organization that is taking action on the food desert problem.

Student Product:

1. Students will read the report and write a memo that includes the organization's name, where they are located, what specific actions they are taking against the food problem, what/if any criticism/questions/or gaps they see in the organizations work. (Students will be reminded of the various layers of the food system we have looked at and will be encouraged to think about how the organizations are addressing multiple of these layers)
 2. After analyzing the case study each team will do a report out to the whole group.
- This unit will culminate in a summative exam in which students demonstrate their knowledge by responding to constructed response, true or false, and multiple choice questions.

Lesson # 9: Are You An Easy Sell? How We Are Influenced By Advertising

Length: One 90-minute class period

Rationale: Students will explore the influence of brand awareness on their own choices, and the strength of impact that brand logo recognition has on children.

Objectives:

- (a) Understand the parallels between advertising and the patterns of consumerism.

- (b) Understand the role of targeted advertising in creating brand awareness in various age groups.

Materials/Preparation: printed pictures of adult brand logos, printed pictures of child brand logos, printed pictures of historical figures, paper pencil, 10 classmates as “volunteers” for activity, chart paper (for graphing activity)

Procedure:

(Before the Activity)

1. Teacher will show presentation on the pervasiveness of marketing and advertising in today’s society, and the impact this constant exposure has on our decision making as consumers (surveys and scientific data to be included in presentation).
2. Students will copy chart displayed by teacher that has the following categories: age of student, # of recognized child logos, # of recognized adult logos, # of recognized historical figures.
3. Students will form a hypothesis as to whether the adult brand logos, the child brand logos, or the historical figures will be most recognizable to the students’ volunteers (their classmates).

(Activity)

1. Students will show each volunteer the pictures of the historical figures. Student will ask volunteer to name the historical figure. Volunteer must provide at least the first name of the historical figure in order for answer to be determined as correct.
2. Results will be recorded on the chart in the form of tally marks for each correctly named historical figure.
3. Repeat steps 1 and 2 for adult brand logos and child brand logos.
4. Tally results for each category.
5. Analyze your results: Which brand was most recognized? Did many kids recognize the brands that are primarily marketed towards adults? In your opinion, why or why not?
6. Graph: Students will create a line graph displaying their results.

Annotated Bibliographies/Works Cited/Resources

“Food Access and Food Justice.” *Food As a Problem*.

<<http://www.teachersforjustice.org/2009/01/curriculum-food-access-food-justice.html>>.

This resource presents, in an interesting and relatable manner, the issue of food accessibility in America, and engages students in assessing obstacles to eating healthy. It also encourages students to develop creative and realistic ways for eradicating the problem.

“Decisions.” *Nutrition Decision*.

<<http://www.pbs.org/opb/childrenshospital/classroom/index.html>>.

This resource stimulates student interest in, and knowledge of, the impact of nutrition on our bodies at the cellular level, and presents multi-disciplinary interactive content.

“Logo Recognition.” *Effects of Media on Children*.

<http://www.education.com/science-fair/article/Can-Kids-Shop-by-Looking-at-Logos/>>.

This resource provides hands-on activities that explore the effectiveness of brand recognition as a marketing strategy used by companies, and how such recognition varies among age groups.

Kittler, Pamela, Sulcher, Kathryn, and Nelms, Marcia. *Food and Culture*, 6th Edition. New York: Cengage Learning, 2011.

This book provides a variety of current, graphically represented information on health, culture, food, and nutrition as it relates to ethnic and racial groups living within the United States. These graphic representations give students the opportunity to interact with the information being taught in a way that develops data literacy.

Learning Zone Express. *Food Science Activities for Middle School*. New York: Learning ZoneXpress, 2009.

This resource offers a variety of activities that are aimed at generating student interest, and understanding, in the area of food science.

Byrd-Bredbenner, Carol. *Exploring Science in the Food Lab*. New York: Goodheart-Willcox Co., 2000.

This book includes a variety of reproducible experiments that plainly explain the scientific principles being explored in each activity, and includes step-by-step instructions for easy and successful duplication.

Daniel, Lucy. *Focus on Life Science*. Ohio: Merrill Publishing Company., 1984.

This resource offers over 100 hands-on activities centered around life science. It connects to the readers' experience and uses simple lab activities to illustrate otherwise complex scientific principles.

Hamer, Todd. *Buckle Down*, 2nd Edition. Iowa: Buckle Down Publishing Co., 2007.

This book offers a variety of graphically represented material to help students make connections and structure thinking, likewise, there are many instructional tools the teacher can use as well.

Appendix/Content Standards

The Core Curriculum of the School District of Philadelphia is aligned with the Pennsylvania State Standards for Middle Years Science. These standards reflect the increasing complexity and sophistication that students are expected to achieve as they progress through school. The standard areas addressed in this unit include: Unifying themes, Inquiry and Design, Biological Sciences, and Science, Technology and Human Endeavors.

The specific sixth grade standards include:

- R6.A.1.3.1: Make inferences and/or draw conclusions based on information from text.
- R6.B.3.3.3 Interpret graphics and charts and/or make connections between text and content of graphics and charts.
- 1.9.6.A Use media and technology resources for self-directed learning, group collaboration, and learning throughout the curriculum.
- 3.2.7.A Answer “what if” questions based on observation, inference or prior knowledge or experience.
- 3.2.7.B Describe relationships by making inferences and predications.
- 3.3.7.B Explain that cells and organisms have particular structures that underlie their functions.
- 3.3.7.B Explain the effect of disease on structures or functions of an organism.