YALE NATIONAL INITIATIVE
to strengthen teaching in public schools®

Curriculum Units by Fellows of the National Initiative
2012 Volume I: Interdisciplinary Approaches to Consumer Culture

Food Choice: How the ingredients on food packaging influence the foods we eat

Curriculum Unit 12.01.08, published September 2012
by Laura Turner

Introduction

Food consumption is both a medical and cultural need for all humans. There are many historical and cultural reasons for why we consume the foods we do. Middle School students are entering a time of transition between eating the food their parents provide and making their own food choices. With obesity, diabetes and eating disorders in children increasing at alarming rates, children need to develop a better understanding about food and the choices they have. This curriculum unit includes a series of independent lessons focused on food choice. The unit will explore both the meaning of popular terms on packaging from a scientific perspective as well as how diet trends influence ingredients in food. Additionally, the unit will focus on sugar substitutes. We will learn how sugar is packaged and repackaged as artificial sweeteners and about their negative impact on health. Activities will include: students cooking foods with all-natural ingredients, analyzing food labels, and designing their own inquiry-project based on questions they have about the subject matter presented.

Rationale

Convenience food is a part of our lives. Emeryville, California which my school serves, is located in the heart of a food swamp. That means that within .5 mile of our school there are seven fast-food restaurants and three mini-marts. The smell of bacon from IHOP fills the schoolyard every morning. Signs that read: "Under 400 Calorie Menu" and "All Natural Breakfast Biscuit" greet students as they pass McDonalds and Seven Eleven en route to school. They are inundated with convenience food and the words that enwrap it. Messages that include words like "organic," "low-fat," " low-carb," "omega-3's," "sugar free" or "high-fructose corn syrup" can be confusing and misleading. Students need to know what these words mean and decide if they want to buy that product based on how it benefits or does not benefit health.

With newly gained knowledge about the words on food packages, students will become better-informed food consumers. When people are hungry and have $5.00 to spend at a mini-mart or grocery store they need to

weigh their options and decide which food works best for them.

Background

Companies package their product to ensure high sales. The size, shape and type of packaging all entice potential consumers to purchase a product. However, this unit focuses on the words and phrases used in packaging and not the package itself. In Michael Pollen's book, *In Defense of Food,* he discusses how processed foods, when packaged with words that make them sound more nutritious than whole foods, can make people believe that the contents are healthier when in fact they probably are not. [1] We must learn more about these frequently used words in order to make informed food purchasing decisions.

Words

Imitation is a word that the food industry has fought to avoid using. In 1938 the Food, Drug and Cosmetic Act declared that when traditional foods like milk, bread or cheese appear as "standard" but have undergone alterations, these foods had to be labeled "imitation." [2] However, the food industry fought to have this law repealed and in 1973 they successfully eliminated the imitation rule. According to Pollen, the food industry felt that "such a pejorative term appear(ing) on fake food packages stood in the way of innovation." [3] The new rule stated that as long as the food had the same nutritional quantities as recognizable ingredients in natural foods, there would be no need for the word imitation. This change of heart came during the time that the American Heart Association (AHA) urged the public to get off of saturated fats and onto vegetable oils to prevent heart disease. Their goal was to modify foods to get saturated fats and cholesterol out of them. [4] The AHA wanted any restrictions on modifying food removed. Once the 1938 law was repealed, the food industry had an open door to use key advertising phrases with the public to get them to buy their product because they wanted them to believe that it was better or more nutritious than the standard. This occurred around the time terms like "low-fat" or "nonfat" had made their way onto food packaging and into the diet-discourse of many consumers.

With no regulations requiring package labeling about ingredient substitutions, ingredients such as hydrogenated oils or guar gum carrageenan replaced natural fats. Creams in most whipped cream or coffee creamer were replaced by corn starch. Pollan notes that even the yolks in liquid eggs could be replaced with anything as long as the substitute was nutritionally equivalent to the real thing. [5] However, it was not the real thing, and no law made it mandatory for a food company to have to disclose the substitute ingredients. [6] With the food industry working with scientists to make sure food contains the highest amount of nutrients, new words emerged— low-fat or low-carb- began popping up on food labels. Food that once had two or three ingredients suddenly had long lists of additives. These additives are not necessarily unhealthy but it are not necessarily healthy either.

One of the first notable artificial foods on the market was margarine. It was created in the 1860s as a cheaper substitute for butter to supply armies. A century later By the 1950's manufacturers found ways to make it "better" by removing bad nutrients like cholesterol and saturated fats found in butter with better nutrients like polyunsaturated fats and vitamins. But the food scientists who created modern margarine didn't realize that by making vegetable oil solid at room temperature "by blasting it with hydrogen," unhealthy trans fats would

emerge. [7] Trans fat proved to be far worse than saturated fats. As a result of consumer demand, margarine was reengineered yet again to remove the trans-fat.

Low-fat and Nonfat

Low-fat diets are encouraged by the American Heart Association to curb high levels of cholesterol that have been linked to heart disease. When fat is removed from a food to create a low fat or nonfat food, something else must be added to make up for the taste difference. For a product to be labeled "free" as in "fat free," it must contain less than half a gram of fat and not necessarily no fat at all. Low fat foods contain less than three grams of fat per serving. This does not necessarily mean that the product contains fewer calories. In fact most low- or no-fat products contain more sugar than their full-fat counterparts. [8] For example, nonfat frozen yogurt often has the same amount of calories as regular frozen yogurt. Also food producers can label a candy bar "low fat" with 150 calories because its fullfat counter part contains 200 calories. Consumers need to be aware, though, that 150 calories may still be too much for their body. [9]

Low Carbohydrate

The push for low-carbohydrate diets began in the 1970's with the popular Scarsdale Diet and Dr. Atkin's Diet Revolution but faded when low-fat and nonfat diets became popular. It resurfaced with gusto in the late 90's and drastically changed American eating habits. Foods like potatoes, breads, and pastas were suddenly banned from American shopping lists. Consumer demand for low-carbohydrate products encouraged food companies to once again redesign whole foods by adding and substituting ingredients to limit carbohydrates. Thus ingredients were adulterated once again. In 1999, *Time* magazine published an article titled, "The Low-Carb Diet Craze." It argued that low carbohydrate diets decrease blood-sugar levels, thereby causing the pancreas to produce less of the energy catalyst insulin. With less insulin the body is forced to burn fat reserves for energy, which may lead to quick weight loss. [10] The counter argument insisted that the increase in insulin is caused by obesity and not by carbohydrates. If carbohydrates are reduced, calories are reduced and that causes weight loss. The Time article highlighted the various low-carb cookbooks that have become best sellers. People with the descriptor "Dr." by their name wrote most of the books but most were not medical doctors. In fact, the majority of American dietitians and doctors remain wary of low-carb diets. Most favor diets, which espouse a reduction of calories and an increase in exercise. ' "Most Americans don't eat enough fruits and vegetables, and now you have diets like Atkins that say don't eat sweet potatoes, don't eat carrots, don't eat corn," says Franca Alphin, administrative director of the Duke University Diet and Fitness Center.' [11] Due to the popularity of this diet, food producers eager to fulfill consumer demands, changed food that is normally high in carbohydrates to become low in carbohydrates.

The year 2003 saw a push for food producers and sellers to change their product to low carbohydrate. According to *The Nutrition Business Journal*, sales for low-carb products were estimated at $1.3 billion in 2003. Fast food restaurants like McDonald's and Burger King market-tested bun-less hamburgers. Subway restaurants contracted with the Atkins Nutritionals Inc. to use the Atkins name on Subway products. [12] This diet fad led to the redesign of traditional foods like bread and pasta. Decreasing carbohydrates in those foods reconstitutes the foods. When standard ingredients are altered and artificial ones are added, it is no longer the standard food consumers' trust. It is now imitation but as Michael Pollan asks, "Who would buy imitation spaghetti?" [13]

Additives

As consumers the question for us remains: what should we do when we are confused about what is in our food? Consumers should question everything and become educated on food packaging. Michael Pollan recommends: "Don't eat anything your great grandmother wouldn't recognize as food." [14] He explains this by referencing an imaginary shopping trip with your great-grandma who is baffled by the sight of "Go-Gurt Portable Yogurt tubes" The question of what is this? Is it a food or toothpaste? arises as grandma doesn't know what it is or how to eat it.. Yogurt (in her day) would have consisted of "milk inoculated with a bacterial culture" [15] and not Go-Gurt ingredients like "high-fructose corn syrup, modified corn starch, kosher gelatin, carrageenan, tri-calcium phosphate" and the ingredient list goes on. It can be argued whether those ingredients are harmful or not, but Pollan's point is that foods are becoming so highly processed that they are no longer what they purport to be.

Bread is another example of a food that has gone from food to food product. Grandma's bread would have been made from flour, yeast, water, and a pinch of salt. Pollan references the ingredient list for "Sara Lee: Soft & Smooth Whole Grain White Bread" as having around 40 ingredients. [16] This is mainly to preserve the bread for longer shelf life. But Pollan also explains that with the recent consumer demand for whole grains, food scientists know that true whole-grain bread is less sweet than white bread, so to overcome this problem they have added high-fructose corn syrup and honey. They have also "deployed 'dough conditioners' including guar gum and azodicarbonamide, to simulate the texture of supermarket white bread." [17] Reading ingredient labels becomes essential if you choose to eat whole food.

Milk has been altered to meet consumer demands for low fat products. Pollan asserts that in lowering the fat, producers must use additives like powdered milk in order to preserve the creamy texture consumers desire. The interesting thing is that powdered milk contains oxidized cholesterol, which is apparently worse for arteries than cholesterol, so antioxidants are added to compensate for that. Additionally, vitamins are fat-soluble, so with the fat removed, the vitamins are removed, thus defeating a main reason to drink milk. [18]

Preservatives are often added to food in order to keep it fresh for a longer period of time. Preservatives are not necessarily bad to consume. However, additional research indicates that commonly used preservatives including sodium nitrite, sulfites and BHT can lead to health issues or can remove valuable nutrients from food.

According to "Principles and Practice of Pediatric Infectious Disease," nitrite preservatives can react with amino acids in your body, potentially forming cancer-causing nitrosamines. Additionally some preservatives can lead to allergic reactions. Specifically, paraben preservatives can raise the risk of breast cancer and cause reproductive dysfunction. Additionally, boys exposed to excessive amounts of parabens prior to puberty may increase the likelihood of developing testicular cancer, prostate disorders and sperm abnormalities. [19]

Authors of the book "Process-Induced Food Toxicants: Occurrence, Formation, Mitigation, and Health Risks," argue that the preservative BHT may cause harm to genetic material and cells. [20] When sulfites are added to foods with vitamin B1 the preservative can destroy the vitamin. As a result, the Food and Drug Administration has banned the use of sulfites on fresh fruits and vegetables.

Sugar

Sugar is the source of calories in most soft drinks and in an array of foods. Sugar makes food taste better. It

has no nutritional value other than to provide calories. Americans consume about thirty pounds more sugar than they did twenty years ago. Today they average 152 pounds of sugar per year. [21] Sugar is a natural ingredient in fruits and lactose in milk. When it is a natural ingredient in fruit, it is called fructose. The consumption of added sugar is double what the USDA says it should be. The National Academy of Sciences notes that when people consume a lot of sugar. it is at the expense of taking in other essential nutrients. [22]

All food is classified into three types of macronutrients: carbohydrates, proteins and fats. These macronutrients each have different functions for the body. Carbohydrates only function is to provide the body with energy. But because protein and fat both provide energy, carbohydrates are not essential for survival. Sugar is a form of carbohydrate. Carbohydrates are classified as simple or complex. Sugars are simple carbohydrates but with the exception of honey, carbohydrates found in nature are either complex or simple and complex together. When natural foods are processed, complex carbohydrates are frequently removed. When an apple is juiced and its fiber removed, the juice only contains simple carbohydrates. It is simple carbohydrates that are rapidly absorbed into the blood stream and can cause blood sugar to spike, which over time may result in obesity, heart disease, cancer or diabetes. [23] The simplest form of sugar is monosaccharides. All complex carbohydrates are formed from it. The three types of monosaccharides are glucose (blood sugar), galactose (milk sugar) and fructose (fruit sugar). With health concerns about the over-consumption of sugar rising, the door was opened for food manufactures to promote sugar free products.

Sugar Free

When sugar is removed from food, artificial sweeteners replace it. Artificial sweeteners are man-made chemical compounds. They are not found in nature and do not contain nutrients like vitamins or minerals. They are very low in carbohydrates and calories. [24] Artificial sweeteners provide that sweet taste people love but without the calories. Discovered by accident at John Hopkins University in 1884, saccharin became the first mass marketed artificial sweetener. It is approximately 300 times sweeter than sugar. [25] Saccharin is derived from toluene, which is a clear, colorless liquid produced in the process of making gasoline from crude oil and in making carbon residue from coal. [26]

In 1903 the Monsanto Company began producing saccharin for a little known company called Coca-Cola. Additionally, saccharin soon became an ingredient in diabetic products because it does not raise blood sugar. [27] However, in 1912 saccharin was banned due to public concerns over potential health risks. Because of World War I, sugar was rationed and the demand for artificial sweeteners increased. Basically "health concerns were brushed aside in the face of economic ones." [28] Saccharin created the foundation for sugar-free products. It is still used in tabletop sweeteners, toothpaste, soda, baked goods, jams, chewing gum, canned fruit, candy, salad dressings and mouthwash. It is available in both powder and liquid forms. The Food and Drug Administration before the year 2000, required warning labels placed on products containing saccharin due to its possible health risks. However, in 2010, the Environmental Protection Agency removed saccharin from its list of hazardous materials.

However, the sweet taste of saccharin may stimulate insulin production from your pancreas. Insulin's main purpose is to transport sugar in the blood stream to various body tissues that can use it for energy. Without any sugar entering the blood stream after ingesting an artificial sweetener like saccharin, insulin has nothing to bind on to. This may decrease insulin "sensitivity", which may increase your risk for developing diabetes. [29]

In the late 50's Sweet N' Low became the first sugar-like substance to be marketed in powder form. At first it

was a combination of the artificial sweeteners cyclamate and saccharin. However, the FDA banned cyclamate in 1969 when research studies indicated that it caused cancer in laboratory rats. The Federal Drug Administration (FDA) is frequently criticized over its policies due to how the food industry influences them. Although, in 1985, the Cancer Assessment Committee of the FDA's Center for Food Safety and Applied Nutrition concluded that cyclamate was not a carcinogen, the FDA has yet to approve it.

Saccharin has continued to vacillate between FDA approval and disapproval. In the late 70's saccharin carried a warning label "Use of this product may be hazardous to your health. This product contains saccharin, which has been determined to cause cancer in laboratory animals." [30] However tests in the early 90's showed that it did not conclusively lead to cancer. In 2000 President Clinton signed a law that removed cancer warnings on saccharin products. [31] Sweet N' Low is now a mixture of saccharin and dextrose. With saccharin falling in and out of favor with the FDA and cyclamate banned, it left the door open for a new artificial sweetener to explode on the Diet Soda world specifically. The new sweetener is aspartame.

Aspartame

Discovered in 1965, aspartame was the third artificial sweetener to dominate the food industry. It followed saccharin and the now banned cyclamate. The brand names for it are NutraSweet and Equal. It is an ingredient in most diet sodas as well as in chewing gum. It is found in over 6,000 products and consumed by over 250 million people worldwide. [32] Aspartame, like the other sweeteners before it, has met with skepticism on its healthfulness. Early safety studies conducted in 1967 indicated potential neurotoxic side effects. The studies showed that when monkeys and mice ingested it some monkeys had grand mal seizures and some mice had brain damage. [33]

G.D. Searle, the manufacturer, invested tens of millions of dollars in research. With all the negative publicity around saccharin and cyclamate, the market was open for another artificial sweetener product to take their place. In 1973 the FDA ruled that there was not enough information to determine aspartame's safety. Searle submitted the necessary information and in July of 1974 preliminary approval was granted. Immediately the validity of Searle's data was questioned. The FDA was petitioned to investigate Searle's inaccurate testing procedures. It was the first time the FDA requested a criminal investigation of a food manufacturer. [34] In 1977 Samuel Skinner, the US attorney leading the investigation against Searle, took a job with Searle. With Skinner's resignation the grand jury investigation stalled long enough that the statute of limitations ran out and the investigation ended. In 1977 the FDA released the Bressler Report which sited errors in Searle's findings. It specifically mentioned that autopsies on tested animals were not done until one year after the animal's death. With so many errors, the safety of aspartame could not be determined. Eventually, Donald Rumsfeld became CEO of Searle and his political ally, President Ronald Reagan, issued an executive order limiting the power of the current FDA commissioner. Within one month of his presidency, Reagan replaced the commissioner with Dr. Arthur Hull Hayes, who had no background in food additives and who went against his own internal FDA team and got aspartame approved by the FDA. Not long after accomplishing this, Hayes took a job with G. D. Searle. [35]

Despite unresolved safety issues and questions over aspartame's heat instability in liquid form, the National Soft Drink Association approved it for use in carbonated drinks in July of 1983. Within the first year the FDA fielded around 600 consumer complaints about side effects. There were reports of headaches, dizziness, aggressive behavior, disorientation, hyperactivity, liver impairment, cardiac arrest, seizures, and suicidal tendencies. [36] The Center for Disease Control (CDC) investigated and determined that there were no "serious,

widespread, adverse health consequences to the use of aspartame." [37] However, out of 166 articles published in medical journals from 1980 to 1985, one hundred percent of 74 studies financed by the industry attested to the sweetener's safety. But out of 92 independently funded articles, 91 identified adverse health effects. [38] This suggests that the source of funds for aspartame studies strongly influences the studies' findings.

High Fructose Corn Syrup

High Fructose Corn Syrup or (HFC) can be dangerous when ingested in high amounts. It is an unnatural form of sugar that is derived from corn and not sugar cane. It is mostly added to soft drinks, ice cream, yogurts, and many more popular food items. The danger is that HFC can be addictive. When people start to crave it, all that extra sugar can lead to extra calories and pounds. The unknowing person is at a higher risk for obesity if he or she ingests it. HFC is void of any vitamins or minerals. [39] Like aspartame, high fructose corn syrup can be found in soft drinks. Once students are aware of these words and the disputed health effects the words represent, they can become more informed consumers. They can decide if imitation sugar is okay for their bodies. Soft drinks are ubiquitous amongst middle school students and they need to be informed about soft drink choices.

Soft Drinks

The National Soft Drink Association has stated "the soft drink industry has a long commitment to promoting a healthy lifestyle for individuals-especially children." [40] The association denies any link between soft drink consumption and poor diet quality even though a twelve-ounce Coke or Pepsi has at least nine teaspoons of sugar. A twenty ounce bottle has 15 teaspoons of sugar. The sugar and calories in soft drinks must affect a child's body. Additionally, caffeine has proven to have addictive qualities. Children who drink a lot of soda may eventually become addicted to it. The reality is that as soft drink consumption rises, milk consumption falls. In fact children today as compared to twenty years ago drink twice as much soda as milk. [41] Soda is highly caloric because sugar is highly caloric. In fact in 2002 scientific report indicated, "more than half of the average child's calorie intake now comes from sodas, juices, and high-calorie drinks." [42] A further study showed that when subjects consumed liquid sugar calories as opposed to solid sugar calories, the liquid calorie group and not the solid calorie group consumed those additional calories. This data was compared to pre-study calorie data on the same subjects. The results indicate that people who consume more liquid calories do not compensate for them by eating less solid calories. [43]

In addition to soft drinks deteriorating health by increasing calories, the American Dental Association has come out with a warning on soft drinks citing a study that links tooth enamel erosion with soft drink consumption [44] .

When discussing children and the unhealthful effects of soft drinks, it is prudent to mention energy drinks as well. Some energy drinks can have more sugar than sodas and should be consumed with caution. However, sports drinks can fall in this category as well. Drinks like Gatorade, Powerade, and All Sport have about the same amount of calories and sugar as Coke. All of those drinks contain High-fructose corn syrup and either sucrose or glucose. [45] Sugar drinks should be consumed in moderation and with the knowledge that liquid calories are the same as food calories and will impact your bodies' health.

The words used to gain consumer attention and loyalty to food products is varied. Consumers read packaging and analyze labels in different ways. Consumers need information in order to make rational choices about their food. Food labels are one way consumers gain knowledge about their food. Margareta Wandel is a

researcher at The National Institute for Consumer Research in Oslo, Norway. She conducted research on consumers and food labels. She wanted to know if they got enough information from the market to buy healthy foods? Does the information on labels reflect consumer food interests? In what areas do consumers need more information? She wrote about her findings in an article titled, "Food labeling from a consumer perspective." [46]

Wandel asserts that food label information must appeal to the consumer and it should be written in a way that they can understand it. When asked which area consumers need better or more information on a food label, the respondents indicated "additives, the food cultivation process (use of agrochemicals) and environmental contaminants." Wandel sites studies done by the Food Marketing Institute that indicate large demographic and socio-economic differences with regard to the use of food labels. Those who read food labels the most tend to be women, highly educated and people on special diets. Also, interest in food labels increases with age up to the mid-fifties and then declines. Food labels provide a lot of information about ingredients, additives and nutrients. Consumers want this information but data shows that a large proportion of consumers do not have enough knowledge to take advantage of the information. Data showed a need to simplify information on food labels. [47] However the dilemma is how to design a food label with enough information to meet consumer demand and yet keep it simple enough as not to deter consumers. Wandel concluded in her own study that when consumers pay attention to food labels the most uncertainty came over additives. She found that the public wanted more information about additives and that consumers are more satisfied when additives are restricted. She mentions that consumer dissatisfaction came from their critique of industrialized food. Wandel's findings coincide with Pollan's assertions on preservatives. Wandel pointed out that consumers in her study felt that "additives may make bread, pastries and cookies so long lasting that the chance of getting old products in the store, is increasing." 75% of the consumers wanted to know more about additives. However, she found that only 30% thought that avoiding additives was important for a healthy diet. This indicates that consumer concern over additives was only partly due to health concerns.

What follows is a series of lessons designed to get students aware of the words on food packaging and for them to develop awareness of their role as a consumer. In that role they need to know what some of the terms they see actually mean. Students come to school with smells and signage about food swamping them. They need to have awareness of what is in or not in their food. They need to read the words on labels and decide if they want to ingest something or more simply how much of it they want to ingest. If they find that they don't want to drink sodas with unnatural flavorings, then they need to know what to look for on labels to find artificial sweetener free drinks.

Lesson Plans

The ultimate goal of this unit is for students to read food packages and have a better understanding of what the words mean. Students need to think critically about food and their body. They need to decide for themselves not only what they will put in their body but also how much they will put in it. They also need to know that they there is bias when it comes to issues surrounding food. Michael Pollen promotes a diet of organic fruits and vegetables, hormone free meats, and minimal additives. Food producers have different opionions on the value of organic and hormone free products. These lessons are designed to have students be aware of bias in writing. They will read a variety of informational articles which have a bias toward food

production. They will have to identify the bias.

This middle school unit is taught from both Language Arts and Health standards. It will be taught over a two-week intensive period. Anna Yates middle school students take a two week break from regular classes to attend an intensive elective course. This unit is written for the intensive session. That means lessons on this topic are taught throughout the entire school day.

By completing the unit students will think critically about food choices and what they put in their body. The intention is to present information in an inquiry based way so students can determine what they want to put in their body.

PBJ (Problem Based Journals)

Each lesson includes an essential question, discussion and informational reading. This is followed by a written journal response composed in blog format. Students then record any new questions they though of during the lesson. At the conclusion of all of the lessons, students will take a question from their journal entries and develop an inquiry project around it. My class calls this PBJ (Problem Based Journals)

Lesson 1: Cognitive Maps

Cognitive maps are also known as mental maps. Students discover a particular aspect of the world around them by manifesting it through a drawing.

The unit begins with student awareness of the food choices that surround them. Using our school as the focal point, students will draw all of the places they recall around them that offer food. Although many fast food chain restaurants and mini marts surround our school, there are grocery stores and locally owned restaurants as well.

Essential Question: What do we know about the food choices surrounding our school?

Create: Students will draw a map of the food choices in our school's neighborhood. They will discuss their work in small groups.

Discussion: What do you notice about the places you have identified? What can you learn about what consumers in our area demand for food? Do you notice an overabundance or under abundance of any particular food in our area?

Respond: Students will create their first blog entry in response to the essential question. They are required to list further wonderings around this topic.

Lesson 2: What's in a chip?

Essential Question: Is that a plant or animal that I'm eating?

Discussion: Partners will examine a Cheeto. They will discuss whether a Cheeto comes from a plant or animal. Is it food? How do they know it is food? Next, students will read the label on a Cheeto bag. They will examine the ingredients and see what they learn about nutrition and what they are ingesting based on the label.

Read: Students read an article from the Wall Street Journal titled: "Can This Chip Be Saved? Frito-Lay Retools

Snack Recipes to Include More Natural Ingredients"

Discussion: What did you learn about the ingredients in chips? How do you feel about unnatural ingredients in your food?

Homework: Students will bring in some type of food from home.

Lesson 3: Is that food whole or processed?

Essential Question: Why did you choose that food item?

Discussion: Some students may have brought it in because it was in an easy to carry container, wouldn't spoil, melt, smell bad, didn't need to be reheated or kept cold.

They will then answer the question: Is what I brought in a whole or processed food? Recalling what they learned about natural verses artificial ingredients from the Frito Lay article, they can determine what foods they eat that are whole (all natural) and which are not.

Create: Students will create a two-column list of the foods they recently ate and separate them into whole foods verses processed foods. They will then write down what they believe are the ingredients in their food and separate them into the two columns. For example, if a student said they ate a piece of pepperoni pizza, they will have to divide tomato sauce, cheese, bread and pepperoni into the two categories.

Watch: Students will watch the documentary Food Inc. that discusses whole foods verses processed foods.

Research: The class will investigate a turkey sandwich. I will bring in the ingredients. Partners will have to research the ingredients in specific brands of bread, turkey, mayonnaise, and mustard. They will investigate where the produce came from and determine how far it traveled and project how long ago it was growing.

Respond: Students will respond to the activity in a blog entry, write down what they learned and what they were surprised by.

Lesson 4: Four Ingredient Fix

Essential Question: Most brand name breads have a long list of ingredients. They have a lot of additives listed. Can I make bread with less than four ingredients?

Create: Students will bake bread with flour, water and yeast

Observe: Students will observe our freshly made four-ingredient bread compared to manufactured bread with more ingredients. They will monitor it for mold. The lesson is about preservatives and students questioning if the bread doesn't go bad with the preservatives, what is it doing in our bodies? The breads will be on display throughout the school year. Depending on time during the two weeks, we will also make pasta and ice-cream with less than four ingredients. Students will always compare what we do to the ingredients listed on popular manufactured items.

Lesson 5: What's that stuff in my drink?

Essential Question: What is in drinks? Do they have fat and calories? Is it possible for drinks to have more ingredients than food?

Discussion: Students will discuss the essential question in partners or small groups.

Lecture: I will present them with the facts on sugar. They will look at pictures of sugar cane and learn about sugar as a carbohydrate.

Read: Students will read the article, "The Truth About Vitamin Water" which discusses the abundance of unhealthy sugar in this drink that is marketed as very healthy. They will also read: "Soft Drinks 102: Schools and Unhealthy Beverages." This is chapter 7 from Kelly Bronwell's book, "Food Fight." The list of readings can be found in the bibliography.

Research: They will research the sugar content of their favorite canned or bottled drinks as well as juice, milk, coffee and other drinks students consume.

Respond: They will record their findings and blog about what they learned. They are required to include further wonderings at the end of their blog.

Lesson 6: Can food be made in a laboratory?

Essential Question: What is an artificial sweetener? Which foods do I enjoy that have artificial sweeteners?

Discussion: Students will discuss the essential question in partners or small groups. They will be given packs of Splenda, NutraSweet, an Equal. They will look at the ingredients listed on the back and discuss what they think these food products are. They can open them and test them in any safe way they want.

Watch: Students will watch a video on Channel One News titled: "The truth about the stuff that makes our food taste sweet."

Labels: Artificial Sweetener

Read: Students will read parts of Joseph Mercola's book: "Sweet deception: Why Splenda, Nutrasweet, and the FDA may be hazardous to your health"

Do: Students will reexamine the Sweetener packets and soda cans. They will take notes on the words on the packaging and note the marketing used to hook the consumer. They will see phrases like: "No calories" and "Sweeter than Sugar." They should think critically about the packaging. Do the words mislead the consumer? How would you package drinks that contain artificial sweeteners?

Discussion: Students will revisit what they first thought about artificial sweeteners and recognize where their new learning has taken them after the reading and the video.

Respond: Students will blog about this topic and create further questions on artificial sweeteners.

Lesson 7:

Essential Question: What can you say about food that is labeled low-fat, nonfat or low carb? What other words or phrases do you hear people talking about in the context of food?

Discussion: Small group or partners will discuss the essential question. Students who want to share in the larger group after will have that chance.

Read: Students will read the article from *Time* Magazine titled, "The Low-Carb Diet Craze."

Respond: Students will respond to the article. They will also respond to their classmates blog entries by leaving at least three comments.

Lesson 8: Food Packaging

Essential Questions: Is food packaging misleading consumers? Should the government put restrictions on it or should manufacturers be allowed to market their product any way they want?

Discussion: Small group or partners will discuss the essential question.

Read: Student's will read Chapter 1 of Michael Pollan's book, "In Defense of Food" where he discusses the changes in food laws since the 1930's. It discusses the FDA's push to remove the label "imitation" from food packaging. Additionally they will read parts of Joseph Mercola's and Kendra Pearsall'sbook where they explore the FDA's relationship with food corporations like Searle and Monsanto.

Create: Students will select a food product of their choice and redesign the label to reflect a more truthful product. They idea is that the product probably won't sound as appetizing and that's why food marketers describe products with alternative descriptors. The end result will be displayed for the school to see popular food products relabeled to better reflect nutritional qualities.

Respond: Students will blog answers to the essential questions and develop more questions.

What is our responsibility in soda consumption? Should laws prevent us from drinking what we want?

Lesson 9: PBJ (Problem Based Journal)

Essential Question: The students will come up with their own question based on the information they have been presented with.

Prior Knowledge: The students will have already had experience with and direction on "investigable" questions verses questions that cannot realistically be answered with our limited time and access restrictions. The questions should be something they can answer with a little more research.

Do: Students will share their questions by writing them on sentence strips. The class will discuss common themes in the questions and will group them according to theme. Students with similar questions will work together to investigate answers to their questions. They can use the internet, conduct interviews, use the library and for students who need to visit a local restaurant or store I will have chaperones that can escort them there for a "fact finding" excursion. However, that will only be offered to the groups after they already have their questions and we find that some students really do need to make a visit to gain more information. The inquiry project will begin on day six of the unit and be completed by day 10.

Presentation: Students will present the answer to their question or if an answer cannot be found they will discuss the process they went through trying to obtain the answer.

The main goal of the unit is for students to become aware of what is inside of their food and to think about why they choose to eat something. Is it because of the label, peer pressure, doctor's orders or because they just like it? Any answer is fine as long as the student is aware of why they made the food choice that they did.

Therefore, assessment is based on the quality of student blog responses and the questions they ask. If the questions are thoughtful and demonstrate that the student is engaged in the content and wanting to know more, they will have met the standard.

Endnotes

1. Pollan, Michael. *In defense of food: an eater's manifesto*. New York: Penguin Press, 2008. 22
2. Ibid., 34
3. Ibid., 34-35
4. Ibid., 35
5. Ibid., 36
6. Ibid., 36
7. Ibid., 33
8. Cooper, Ann, and Lisa M. Holmes. *Bitter harvest: a chef's perspective on the hidden dangers in the foods we eat and what you can do about it*. New York: Routledge, 2000. 186.
9. Ibid., 186
10. http://www.time.com/time/magazine/article/0,9171,992401,00.html#ixzz22LHuP2KL
11. http://www.time.com/time/magazine/article/0,9171,992401,00.html#ixzz22LV58H4s
12. http://www.pbs.org/newshour/bb/health/jan-june04/carb_04-23.html
13. Pollan, 39
14. Pollan, Michael. *In defense of food: an eater's manifesto*. New York: Penguin Press, 2008.
15. Pollan, 149
16. Pollan, 155
17. Pollan, 153
18. Pollan, 154
19. http://www.livestrong.com/article/477901-what-do-preservatives-do-to-your-body/#ixzz23dVONrbP
20. Stadler, Richard H., and David R. Lineback. *Process-Induced Food Toxicants Occurrence, Formation, Mitigation, and Health Risks.*. Hoboken: John Wiley & Sons, 2008.
21. Brownell, Kelly D., and Katherine Battle Horgen. *Food fight: the inside story of the food industry, America's obesity crisis, and what we can do about it*. Chicago: Contemporary Books, 2004. (29)
22. Brownwell, 29
23. Mercola, Joseph, and Kendra Degen Pearsall. *Sweet deception: why Splenda, Nutrasweet, and the FDA may be hazardous to your health*. Nashville, TN: Nelson Books, 2006. 27 (5)
24. Ibid., 21-22
25. Ibid., 21
26. Ibid., 19
27. Ibid., 21
28. Ibid., 21
29. http://www.livestrong.com/article/470503-side-effects-of-saccharin-sodium/#ixzz22Q6c9nXF
30. Mercola and Pearsall, 27
31. Ibid, 27
32. Ibid., 54
33. Ibid., 56

34. Ibid., 57
35. Ibid., 60
36. Ibid., 60-61
37. Ibid., 61
38. Ibid, 61
39. www.anotherway.org
40. Brownell, 163
41. Ibid., 167
42. Ibid., 167
43. Ibid., 168
44. Ibid., 170
45. Ibid., 170
46. Wandel , Margareta. "Food labeling from a consumer perspective." *British Food Journal* 99, no. 6 (1997): 212-219.
47. Wandel

Bibliography

Brackett, Elizabeth. "PBS NewsHour | PBS." Low Carb Craze. http://www.pbs.org/newshour/ (accessed August 1, 2012).

Brosius, Jeanni. "5 Things You Need to Know About Transfat ." www.livestrong.com. www.livestrong.com/article/3710-need-trans-fat/ (accessed August 1, 2012).

Brownell, Kelly D., and Katherine Battle Horgen. *Food fight: the inside story of the food industry, America's obesity crisis, and what we can do about it*. Chicago: Contemporary Books, 2004.

This is an easy to read book written by a Yale professor who is leading the way on the fight against obesity by lobbying for government regulation on sugar and soda consumption.

Cooper, Ann, and Lisa M. Holmes. *Bitter harvest: a chef's perspective on the hidden dangers in the foods we eat and what you can do about it*. New York: Routledge, 2000.

Bitter Harvest is written by Ann Cooper who is friends with Alice Waters. The two of

them have been instrumental in bringing local, seasonal food to schools. Ann is based out of Berkeley, California and works in the school lunch program for Berkeley Unified.

Mercola, Joseph, and Kendra Degen Pearsall. *Sweet deception: why SplendaÃ‚Â®, NutrasweetÃ‚Â®, and the FDA may be hazardous to your health*. Nashville, TN: Nelson Books, 2006.

This book has a lot of information on the FDA and its role in the controversy over how chemically engineered foods become approved by the FDA.

Mintz, Sidney Wilfred. *Tasting food, tasting freedom: excursions into eating, culture, and the past*. Boston: Beacon Press, 1996.

Neveau , Mark J. . "Brain Food." Nutrition Dynamics. https://nutri-dyn.com/images/LinkedPDFs/BrainFood.pdf (accessed August 1, 2012).

Pollan, Michael. *In defense of food: an eater's manifesto*. New York: Penguin Press, 2008.

Stein, Joel . "The Low-Carb Diet Craze." Time.com. http://www.timemagazine.com (accessed August 1, 2012).

Wandel , Margareta. "Food labeling from a consumer perspective." *British Food Journal* 99, no. 6 (1997): 212-219.

Appendix

---

6 th Grade California State English Language Arts Standards

2.0 **Reading Comprehension (Focus on Informational Materials)**

Students read and understand grade-level-appropriate material. They describe and connect the essential ideas, arguments, and perspectives of the text by using the knowledge of text structure, organization, and purpose.

Expository Critique

2.6 Determine the adequacy and appropriateness of the evidence for an author's conclusions.

2.7 Make reasonable assertions about a text through accurate, supporting citations.

2.8 Note instances of unsupported inferences, fallacious reasoning, persuasion, and propaganda in text.

Research and Technology

1.4 Use organizational features of electronic text (e.g., bulletin boards, databases, keyword searches, e-mail addresses) to locate information.

Writing Application

2.3 Write research reports:

a. Pose relevant questions with a scope narrow enough to be thoroughly covered.

b. Support the main idea or ideas with facts, details, examples, and explanations from multiple authoritative sources (e.g., speakers, periodicals, online information searches.

c. Include a bibliography.