

You Are What You Eat

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Overview

The intention of the curriculum unit, “You are what you eat”; is to initiate a “health literacy” program for children in a kindergarten classroom. Lessons focus specifically on nutritional issues as they relate to everyday concepts such as eating, shopping, cooking, and food groups. Children will be able to recognize the importance of a balanced diet for staying healthy and strong. They will learn the origins of familiar foods, observing and describing the characteristics of different foods in the food pyramid. The kindergarten students will learn the role of eating healthy foods in helping the body grow and providing energy to play as well as keeping the mind healthy and preventing them from getting sick.

The unit should be completed after the second marking period when students have developed basic concepts of print and can engage in and experiment with reading and writing. They can also match spoken words with written ones and are able to write most letters and some high frequency words. “You are what you eat”, a title which in and of itself uses high frequency words and is simple to remember, will enable them to understand and use information to make healthy choices that could reduce their potential (numerous) health risks. The teacher will provide opportunities for children to write through daily journal writing and create a health literacy rich environment by incorporating a word wall for the unit. The lessons can be completed in three to five days during the health and science classroom time periods.

Because learning healthy behaviors young is essential for students to reach their full academic potential, (that is, both their full physical and mental growth) and maintain lifelong healthy eating habits, this unit will attempt to delve into the many issues and relevant nutritional information currently available in an early childhood format. Students will explore, construct, and create as they interact with cross-curricular manipulatives and materials, other students, parents, and of course, the teacher. Selections from children’s literature will be included in each lesson. These lessons should be simple, yet potentially very effective ways to improve the quality of life and academic successes for students

now and in their futures. For five and six year-olds, what they do now and the nutritional information they learn can have a lifelong impact on the head start to good health.

Rationale

Eat fish and grow smart. Eat carrots and sharpen your vision. Spinach gives you muscles. Does that really happen? We have all been inundated with a plethora of information on the role of a healthy diet. Numerous studies have also investigated the important relationship between diet and academic performance. The specific topics I review involve the relationships between nutrients and learning, behavior and learning, hunger, childhood nourishment and adulthood diseases.

Well nourished children have greater success.

Proper nutrition underlies good health. In fact, nutrition is defined in the American Heritage College Dictionary as the “relationship between diet and health”. Improper nutrition, whether that is defined by imbalances, excesses or deficiencies, has a serious impact on bodily functions and in turn on well being for all people, but this is most dramatic in children. It is well documented that many common bodily problems and diseases can either be avoided entirely or alleviated by improving one’s diet. Just a few of many examples of such “diseases of diet” are scurvy, anemia, and diabetes.

Not only are diseases directly caused by improper nutrition, suboptimal diets can also predispose children to an increased risk for chronic diseases, such as cancer and cardiovascular disease later in life. A variety of nutrients, including vitamins A, C, D, and E and iron, zinc, selenium, copper, and magnesium, all of which will be discussed later in greater detail, affect proper body functioning, with particular emphasis on the immune system (Kubena and McMurray, 1996). Compromises in the intake of these important dietary constituents can increase susceptibility to infection. One noteworthy statistic is that fourteen percent of all deaths in the United States in 1990 could be attributed to poor diets (McGinnis and Foege, 1993).

Two separate problems resulting from improper nutrition affect many school age children in the United States: undernourishment and obesity. Although seemingly opposite in nature, these problems both stem from unsuitable diets. There are six main classes of nutrients that the body needs: carbohydrates, proteins, fats, vitamins, minerals, and water. Each of these necessities interplay in complex ways to fuel body functions and maintain proper health.

First, although the prevalence of chronic under-nutrition (defined as having weight for height below the 5th percentile) is relatively low and has been estimated at only 1.0% of all children and 10% even in the highest risk groups in the United States, intermittent episodes of prolonged food insufficiency and hunger are more common, especially in low-income populations (Kleinmann et al., 1998). The U.S. Department of Agriculture (USDA) reported that in 2005 35.1 million people lived in households considered to be

food insecure¹ and of those 35.1 million, 22.7 million are adults (10.4 percent of all adults) and 12.4 million are children (16.9 percent of all children). Perhaps the most sobering statistic from the USDA's 2005 report though, is that the total number of people in the worst-off households rose in 2005, from 10.7 to 10.8 million. Clearly, hunger is a real issue.

In fact, under-nutrition during childhood affects a child's development in many ways. Some primary and early results of under-nutrition are stunting of growth and psychomotor development (Mendez and Adair, 1999). Recent reviews have reported that undernourished children explore their environment less, have shorter bouts of play, and are less attentive to novel and social stimuli than more well-nourished children (Grantham-McGregor 1995, Wachs 1995). In the United States, one study found that even after adjusting for confounding variables, 6- to 11-year-old food-insufficient children had significantly lower arithmetic scores and were more likely to have repeated a grade, have seen a psychologist, and have had difficulty getting along with other children (Alaimo et. al. 2000). Although many studies have documented a relationship between early malnutrition and concurrent performance on various tests of mental ability, it remains uncertain whether the cognitive effects of early nutritional deficits persist into adolescence (Grantham-McGregor 1995). This at least allows for the possibility of intervention to those estimated 16.9% of American children who have experienced episodes of hunger and undernourishment such that these episodes will not permanently affect academic performance and well-being after a proper diet is reestablished.

Specific elements in the diet with documented negative consequences when absent are vitamins A, C, D, and E and iron, zinc, selenium, copper, and magnesium. For example, a deficiency of vitamin A may lead to eye problems with dryness of the conjunctiva and cornea, dry skin and hair, blindness, and poor growth (http://causeof.org/vitamins_a.htm). A specific "learning-related" impairment stems from calcium or magnesium deficiencies. Lacking either of these essential minerals are very common causes of ADD and ADHD (<http://causeof.org/vitamins.htm#Mag>). Therefore, malnutrition has significant consequences in all people, including school-age children.

¹ "Food insecurity" is a term that the government uses to describe the levels of hunger problems typically faced. Food security is defined as assured access at all times to enough food for a healthy life, with no need for recourse to emergency food sources or other extraordinary coping behaviors to meet basic food needs. The most widely used measure of hunger in the US was developed by the Community Childhood Hunger Identification Project (CCHIP) which conducted a series of 18 studies using large, rigorously selected, samples in communities across the United States. CCHIP categorizes families as "hungry," "at-risk for hunger" or "not hungry" on the basis of parent answers to 8 standardized questions about child and family experiences of food (Food Research and Action Center, 2007).

The other side of the coin: childhood obesity

While hunger and malnutrition have the dramatic consequences on academic performance and general health described above, the other extreme, childhood obesity, is a severe problem, as well. Poor dietary habits, as well as inactivity, contribute to the incidence of obesity in children. According to the Centers for Disease Control and Prevention, approximately 30.3 percent of children (ages 6 to 11) are overweight and 15.3 percent are obese. For adolescents (ages 12 to 19), 30.4 percent are overweight and 15.5 percent are obese. The same group reported that overweight prevalence is higher in boys (32.7 percent) than girls (27.8 percent). In adolescents, overweight prevalence is about the same for females (30.2 percent) and males (30.5 percent). Minorities also have particularly high incidence of childhood obesity (American Obesity Association, 2005). These statistics are summed up in tables 1, 2, and 3.

Table 1: Increase in Obesity Prevalence (%) Among U.S. Children (Ages 6 to 11)

<i>YEARS</i>	<i>Boys</i>	<i>Girls</i>
1999 to 2000	16	14.5
1988 to 1994	11.6	11
1971 to 1974	4.3	3.6

Data from: CDC, National Center for Health Statistics, National Health and Nutrition Examination Survey. Ogden et. Al. JAMA. 2002; 288:1728-1732.

Table 2: Increase in Obesity Prevalence (%) Among U.S. Adolescents (Ages 12 to 19)

<i>YEARS</i>	<i>Males</i>	<i>Females</i>
1999 to 2000	15.5	15.5
1988 to 1994	11.3	9.7
1971 to 1974	6.1	6.2

Data from: CDC, National Center for Health Statistics, National Health and Nutrition Examination Survey. Ogden et. Al. JAMA. 2002; 288:1728-1732.

Table 3: Obesity Prevalence in U.S. Children and Adolescents by Ethnicity in 1996

<i>RACE</i>	Children (Ages 6 to 11) Prevalence (%)	Adolescents (Ages 12 to 19) Prevalence (%)
Black (Non-Hispanic)	19.5	23.6
Mexican American	23.7	23.4
White (Non-Hispanic)	11.8	12.7

Data from: CDC, National Center for Health Statistics, National Health and Nutrition Examination Survey. Ogden et. Al. JAMA. 2002; 288:1728-1732.

Clearly, childhood obesity is a rapidly growing problem that may soon be considered to have reached epidemic proportions. Aside from carrying a social stigma, being overweight during childhood has many adverse health effects. Because overweight children tend to become overweight adults, the increase in childhood obesity is an indicator of a continuing obesity epidemic. Also, children express the same comorbidities² that are associated with being overweight and obese as adults. Thus, being overweight during childhood brings with it comorbidities that will increase the duration of comorbidities in an individual by one to two decades, a factor that can increase the impact of a number of risk factors on adult diseases (Deckelbaum and Williams, 2001)

A specific comorbidity of childhood obesity is the development of asthma. It is well established that obesity is more common among children with asthma. Different research teams have argued whether asthma is a cause or effect of obesity, or perhaps, both. It is possible that asthma causes obesity due to a lack of physical activity among children with asthma. Some studies suggest, on the other hand, that obesity is associated with an increased risk of asthma development in prospective studies. In fact, in girls, becoming overweight or obese between the ages of 6 and 11 years has been found to increase the risk of developing new asthma and to increase bronchial responsiveness during adolescence (Redd and Mokdad, 2002). But whether causal or not, it is undeniable that the prevalence of the overweight is reported to be significantly higher in children and adolescents with moderate to severe asthma compared to a peer group (American Obesity Association 2002).

Another health consequence of childhood obesity is increased cardiovascular disease risk. In fact, persistently elevated blood pressure levels have been found to occur about 9 times more frequently among obese children and adolescents (ages 5 to 18) than in non-obese children and adolescents. Obese children are 2.4 times more likely to have high diastolic blood pressure and 4.5 times more likely to have high systolic blood pressure than their non-obese peers (Freedman et al, 1999). Thus, being overweight is consistently related to several cardiovascular disease risk factors.

Also, because bone and cartilage are in the process of development during childhood, neither is strong enough to bear excess weight. As a result, a variety of orthopedic complications occur in children and adolescents with obesity. For example, in young children, excess weight can lead to bowing and overgrowth of leg bones. In addition to this, increased weight on the growth plate of the hip can cause pain and limit range of motion. It is estimated that between 30 to 50 percent of children with this condition are overweight (American Obesity Association 2002).

With the rising prevalence of obesity in children, noninsulin-dependent diabetes mellitus (type 2 diabetes) is no longer just a problem in adults. Truly, type 2 diabetes in children and adolescents has increased dramatically in a short period. In one report, just 4% of new diagnoses of diabetes before 1992 were classified as type 2 diabetes. Then, in 1994,

² Comorbidity describes the effect of all other diseases an individual patient might have other than the primary disease of interest.

16% of new diabetics were classified as type 2, a 4-fold increase (Freedman et al 1999). One alarming statistic was that in the Cincinnati area between 1982 and 1994, there was a 10-fold increase in type 2 diabetes in children, with the African American population being more severely affected than the white population (Deckelbaum and Williams, 2001). The CDC reports that obese children and adolescents are 12.6 times more likely than non-obese to have high fasting blood insulin levels, a risk factor for type 2 diabetes (American Obesity Association, 2002).

Finally, an obesity comorbidity in children that has obvious implications for learning and academic performance in general is sleep apnea. Sleep apnea is the occurrence of repetitive episodes of complete or partial obstruction of the upper airway during sleep, usually in association with loud snoring and daytime sleepiness. One study does demonstrate a significant association between obesity, as measured by the BMI, and increased neck circumference, with sleep apnea and goes on to estimate that sleep apnea occurs in about 7 percent of children with obesity (Redline et al, 1999). Sleep apnea results in daytime sleepiness, which negatively impacts logical thinking.

All of the findings described above emphasize the importance of the prevention and treatment of obesity in school-age children. In January 2007, the surgeon general released a “call to action to prevent and decrease overweight and obesity” in which recommendations were outlined for healthy eating and heightened activity levels were encouraged (U.S. Department of Health & Human Services). This is a problem which undoubtedly requires immediate attention and prompt action.

Hunger, behavior, and learning: A critical interplay

As discussed earlier, chronic malnutrition undoubtedly hinders cognitive development and performance. However, there is also evidence that acute variation in nutritional status, such as through intake of just one meal or the composition of a single meal, may influence cognitive performance, via arousal levels (Gibson and Green 2002). Though the field of study of *acute* effects of food on learning and academic performance is complicated and often has disparate results across different research groups, a few agreed upon observations emerge. One such repeatable observation is that breakfast can often improve cognitive function and this is a finding most often and unequivocally seen in young children (Cueto, 2001). One classic paper that compared children who ate breakfast with those that did not, noted that the breakfast eaters scored better on standardized test, have improved math scores, and have improved reading and vocabulary scores (Meyers et al, 1989).

Results about the effects of the *content* of that meal, however, are more mixed, but one fairly recent review summed them up as follows: “For nutrient composition, despite inconsistencies, some cautious predictions can be made. Acutely, carbohydrate-rich–protein-poor meals can be sedating and anxiolytic; by comparison, protein-rich meals may be arousing, improving reaction time but also increasing unfocused vigilance. Fat-rich meals can lead to a decline in alertness, especially where they differ from habitual fat intake (Gibson and Green, 2002)”.

From an educator’s perspective, there is some anecdotal evidence to support positive correlations between eating and mood, and also between mood and learning. Frankly, it seems obvious that children who are well-nourished learn better. I believe that basic human

needs must be met (for example, alleviating feelings of anxiety or hunger) before a child can be effectively taught. Concentration and eating seem to go hand in hand. Hungry children have more behavioral problems and it is these behavioral problems which too often impede academic progress.

Rationale for the Curriculum

The specific topics I reviewed related diet and hunger to health and learning. As discussed, proper nutrition underlies good health. Diseases directly caused by improper nutrition, from the effects of malnutrition to obesity and its various comorbidities, abound and strike too many children in the United States. Indeed, malnutrition hinders cognitive development and performance. There is also a great deal of evidence on *acute* effects of food on learning and academic performance- findings that were made most relevant to school aged children with the institution of school breakfast programs. Therefore, the purpose of this curriculum unit will be to help children recognize what a balanced diet is and its importance for staying healthy and strong. Through this unit, students will learn the impact of eating healthy foods to help the body grow and provide energy to play as well as keeping the mind healthy and prevent them from getting sick. If these lessons are taught early to children, many adult public health issues may be prevented.

Objectives

In alignment with the Pennsylvania Academic Science Standards 3.8A(Science, Technology and Human Endeavors), 4.3.4C(Environmental Health) and 4.8.4A (Humans and the Environment), students will learn how to select and use agricultural products, know the impact of eating different products, and identify healthy and unhealthy products of agriculture. Students will be able to recognize that human beings need water, food, and air for their survival. To the extent that these are available in sufficient quantities, people can survive and live in a healthy environment.

Health standards and objectives include learning to identify the foods that make up a well-balanced diet while building vocabulary: food pyramid, grains, nutrients, calories, protein, junk food, etc. Students will learn to plan a well-balanced meal when they create a placemat model with magazine pictures of foods from each of the food groups. They will sort and classify information according to the food pyramid. Students will comprehend concepts related to health promotion and demonstrate the ability to practice health-enhancing behaviors and avoid or reduce health risks. Health Standards are 10.1.3; Concepts of Health and 10.2.3; Healthful Living.

Cross-curricular objectives include:

- Language arts; students will identify and sort common words in basic categories, write a word web, and be able to match words to text. They will

be able to use pictures and context to make predictions about healthy foods and healthy living, and to connect their family life experiences to the lessons.

- Mathematics: Students will be able to create a bar graph to retrieve information about the foods they eat. They will count the foods in various categories. They will be able to understand simple measurements.

Instructional Strategies

Use of brainstorming activities before introducing the new lessons are important in an early childhood classroom to access prior knowledge and engage students. Several of these strategies are outlined in the School District of Philadelphia Core Curriculum Guidebooks. List-Group-Label is a strategy in which the teacher will ask students what they know about a topic. The teacher makes a list, then takes the list and group the items that are similar. Then the teacher will label the groups using brief titles. For example, for the “**Supermarket Shopping Spree**” lesson, the teacher will write on chart paper student responses for items found in a supermarket. Then the teacher will categorize the items into natural and processed food groups, then finally on the same chart paper, label those foods as fruits, dairy, grains, fats, and sweets. Whenever possible, the use of props and manipulatives will enhance the lesson for young children. The plastic fruits and vegetables, sandtimer or timer, and housekeeping accessories all add to the excitement of the activity.

Activate prior knowledge through discussions and questions in each lesson and always begin the lesson with a read-aloud story or book. In the “**Perfect Portions Placemat**” activity, the *Edible Pyramid* story is a delightful way to introduce food choices and serving sizes in each food group. There are several good books to read for this activity and are mentioned in the childrens references.

Vocabulary extension is an integral part of the curriculum unit and the topic of the third lesson, “**Fishing for Words**”. This activity will enable the children to store information about the meanings and pronunciations of words necessary for communication about nutrition. In this activity, words are matched to their picture. All words are taken from the Health Literacy Word Wall which is created and added to after each lesson. There are ten words: nutrients, food pyramid, fruits, vegetables, meats, protein, junk food, milk group, grains, and calories. New words can be added as vocabulary develops.

Each lesson is designed to build on the foundation of the previous activity. The first lesson explains how to buy the food. The second lesson informs how to eat the food and serving sizes. The third lesson incorporates the new content vocabulary in a fun way so that the words will be retained to memory.

Journal writing is a necessary component to this unit. It allows the children to express their thoughts in their writing and drawing. Again, words are used from the word wall as a reference for writing. Journal writing is usually done at the conclusion of the activity.

As a math extension, survey the quantities of fruit/vegetables that are eaten by the class (homework assignment). Display as a bar graph or a pictogram.

The lessons usually end with an activity for the entire class that is multilevel, so that all students are able to approach it with a degree of success. But these activities could also be utilized as learning center activities to understand, apply, and extend the curriculum unit. In fact, the health literacy concepts taught will engage the students, support literacy goals, and address the Pennsylvania state standards.

Classroom Activities

Lesson One: Supermarket Shopping Spree

Objectives

Students will:

- Identify healthy and unhealthy products of agriculture
- Look for foods from each food group when they visit the supermarket
- Classify foods into appropriate food categories as designated by the purpose of the lesson (examples are natural and processed, food pyramid groups and fresh, canned, frozen, or dried)
- Discuss new words and word meanings

Content

PA Standards

Science

- 3.8 A Science, Technology and Human Endeavors
- 4.3.4 C Environmental Health
- 4.8.4 A Humans and Environment

Literacy

- 1.3 A Reading, Analyzing, and Interpreting Literature
- 1.6 B Speaking and Listening
- 1.5 A Quality of Writing

Curriculum Connections

Literacy, Math, Science, Health

Materials

Shopping basket or kid size shopping cart, plastic food items, miniature boxes of cereal and mixes, plastic fruit and vegetables (most or all items can be taken from the housekeeping center in the kindergarten classroom, other items can be bought at any dollar store), a timer, writing journals and crayons

Activity

Display the book, *Out and About at the Supermarket* by **Kitty Shea**. Ask the students about the things they like to buy when they go with their family to the supermarket. On chart paper, write student responses. Then break the items into two groups; natural and processed. Using the same chart, break the two groups into food groups. Read the story aloud. After reading, have children answer questions about the story.

1. What are some of the things in the refrigerated sections of the store?
2. What are some of the items in boxes?
3. Where did these foods come from?
4. What kinds of foods are there?

Place the plastic foods and other items on the classroom tables and shelves. Explain to the children that they will have thirty seconds to shop for as many items as they can. Using the timer, the students will take turns putting things into the shopping cart or basket. When the timer stops, the student has another thirty seconds to empty the cart into food categories as designated by the teacher. Continue in this manner until every child has a turn. Initially, the categories should be simple such as drinks and food. Food groups such as fruits, vegetables, dairy, meats, and fats are another way to classify the items. As the game evolves, vary the food categories to include breakfast foods or snack foods. As the students take turns, invite discussions about the foods involved. Is it junk food or is it good for you? What foods should be eaten the most? What foods should be eaten the least? Discuss the foods that are part of a well balanced diet.

Wrap up the activity by asking children to draw and label pictures of the foods found in each of the six food groups in their writing journals. Then name a food and have children point to the food group where it belongs. As an extension to the lesson, ask the students what would they put in the shopping cart to make a healthy lunch for school. Students can write about it in their journals.

Lesson Two: Perfect Portions Placemats

Objectives

Students will:

- Recognize the Food Guide Pyramid and name at least three foods in each group
- Become proficient at locating where each food item belongs in the food pyramid
- Learn to identify the foods that make up a well-balanced diet when they create an individual collage placemat
- Identify fruits and vegetables in their own diet
- Practice counting and adding skills when reading and learning about serving size

Content

PA Standards:

Literacy

- 1.1 E Learning to Read Independently

- 1.1 F Learning to Read Independently

Mathematics

- 2.4 A Mathematical Reasoning and Connections
- 2.1 I Numbers, Number systems, and Number Relationships

Health

- 10.1.3 Concepts of Health
- 10.2.3 Healthful Living

Curriculum Connections

Literacy, Math, Science, Health, Art

Materials

Construction paper with a large triangle drawn on each, scissors, glue, Magazines, grocery store circulars and coupons of pictures containing food

Activity

Begin the activity by displaying a poster of the Food Guide Pyramid for Young Children (USDA, 2005). Point out the different sections and inform the children that in order to stay healthy we need to eat foods from all of the food groups. Explain how the triangle shaped Food Guide Pyramid is designed to show which type of food should be eaten most and which should be eaten least.

Read the book ***The Edible Pyramid: Good Eating Everyday*** by **Loreen Leedy**. While reading the book, have the students identify the food groups and point them out on the poster. After reading the story, inform the children that they will be making a collage placemat. Show an example of a collage. Explain that they will cut pictures out of magazines and circulars and glue them on the placemat, paying special attention to the serving sizes just as the animals did in the book.

For children 4-8 years old, the FDA recommends eating 4-5 ounces of grains each day. One ounce of grain is equivalent to one slice of bread, a half cup of pasta or rice, and one cup of cereal. The FDA also recommends eating 1.5 cups of vegetables a day and 1-1.5 cups of fruit a day. Fruit is high in fiber and vitamins and an essential part of a balanced diet. Juices, though made from fruit, are often high in sugar. Children should drink juice in moderation. For children 4-8 years old, the FDA recommends eating 1-2 cups of milk or other calcium-rich food a day. Calcium-rich foods include yogurt, cheese, and calcium-fortified juices. Dairy products should be low or fat-free. Children should eat 3-4 ounces of meat or beans a day. This food group includes chicken, fish, beef and other meats as well as nuts such as almonds, peanuts, walnuts, and pecans. These foods are all high in protein, which the body uses to repair the body and build muscles. Choose lean meats such as chicken and fish, and choose grilled meats over fried. Fats and oils are an essential part of any balanced diet, but the FDA recommends eating foods in this category in moderation (USDA, 2005).

Allow time for the children to cut and glue the pictures to the placemat. This may be a two-part activity as the students cut out pictures on the first day and glue them the next.

Laminate each placemat to use with the culminating activity of a 'Food Fair', in which students bring healthy snacks to share with the class and parents. Extend the activity by having children keep a journal for homework that week to tally the fruits and vegetables they have eaten. Make a classroom graph of the results. Also, every day that week, have students write or draw a picture of all the fruits and vegetables they ate that day in their journal.

Lesson Three: Fishing for Words

Objectives

Students will:

- Acquire a basic reading vocabulary by identifying health literacy words
- Respond to and discuss a variety of text and illustrations
- Use illustrations and text to make logical predictions
- Discuss new words and new word meanings
- Demonstrate correspondence between labels and pictures

Content

PA Standards

Literacy

- 1.1E Learning to Read Independently

Health

- 10.1.3 Concepts of Health
- 10.2.3 Healthful Living

Mathematics

- 2.1 G Numbers, Number systems, and Number Relationships

Curriculum Connections

Literacy, Science, Health, Math

Materials

Blue Plastic tablecloth for the pretend pond, ruler with yarn and a strong magnet attached to the end of the yarn for the fishing rod (duct tape works well to attach the yarn to the ruler and the magnet can be knotted to the yarn), index cards with business card magnets on the back of each card (from office supply store)

Each card will have either a word from the health literacy word wall on the front, or a drawing of the word. Create a picture and word database by drawing/photographing foods and scanning them into a computer. Words include Food Pyramid, grains, vegetables, fruits, milk group, meats and beans group, protein, calcium, junk food, water

Activity

Read the book ***Good Enough to Eat*** by **Lizzy Rockwell**. Discuss the illustrations and the importance of good nutrition. Point out the word wall which incorporates the

previous lessons vocabulary words. Show the index cards (cut out as a fish shape) with the words and pictures to the students. Read each card. Then place the cards with the magnet side down on the blue plastic. Tell the children that they are going fishing. They will catch a sight word, read it and then try to catch the card with the matching drawing. For example, a child stands next to the 'pond' and dangles the fishing pole over the pond. He snags a card with fruits. He takes the card (fish) off the rod and reads it. He then must go back and find the card with the illustration of fruit and 'catch' it. If he catches the right card, he will keep the pair. The child with the most matches wins.

This game can be played as a whole group or with a small group at a center. The number of vocabulary words can vary as well depending on the lesson and the level of challenge. End the lesson with journal writing.

Annotated Bibliography

1. Alaimo K, Olson CM, and Edward A. Frongillo. Food Insufficiency and American School-Aged Children's Cognitive, Academic, and Psychosocial Development. *PEDIATRICS* Vol. 108 No. 1 July 2001, pp. 44-53

- *Journal article which reports that 6- to 11-year-old food-insufficient children had significantly lower arithmetic scores and were more likely to have repeated a grade, have seen a psychologist, and have had difficulty getting along with other children.*

2. American Obesity Association, 2002. <http://www.obesity.org>. Updated: May 2, 2005. accessed: March 13, 2007.

- *This website has a lot of facts about obesity, in general, but also includes links to childhood specific obesity problems and statistics.*

3. CDC, National Center for Health Statistics, National Health and Nutrition Examination Survey. Ogden et. al. *JAMA*. 2002; 88:1728-1732.

- *Source of statistics here about the prevalence of childhood obesity among different American demographic populations.*

4. Cueto, S. Breakfast and Performance. *Public Health Nutrition*, 4(6A): 1429-31. 2001
Freedman DS, Dietz WH, Srinivasan SR, Berenson GS. The relation of overweight to cardiovascular risk factors among children and adolescents: the Bogalusa Heart Study. *Journal of Pediatrics* 1999; 103(6):1175-1182.

- *This review article summarizes information from empirical sources about the effect of breakfast consumption on energy availability, nutritional status, school attendance and performance.*

5. Deckelbaum, RJ, Williams, CL. Childhood Obesity: The Health Issue. *Obesity Research* (2001) 9:S239-S243.

- *This paper presents a thorough review of childhood obesity and comorbidities.*

6. Food Action and Research Center. <http://www.frac.org/>. Updated: March 19, 2007. Accessed: March 19, 2007.

- *This website contains information about measures of food insecurity and percentages of American households that qualify according to CCHIP.*

7. Gibson EL, Green MW. Nutritional influences on cognitive function: mechanisms of susceptibility. *Nutrition Research Reviews*, 15(1): 169-206. 2002.

- *This review article considers the impact of nutritional variation, within populations not overtly malnourished, on cognitive function and arousal. It discusses the impact of eating meals in general, as well as the impact of the caloric or nutritional content of said meals on arousal levels and performance.*

8. Grantham-McGregor S. A review of studies of the effect of severe malnutrition on mental development. *J. Nutr.* 1995;125:2233S-2238S

- *This is a review of studies on the relationship between mental development and severe malnutrition that reports that children who suffered from early childhood malnutrition have generally been found to have poorer IQ levels, cognitive function, school achievement and greater behavioral problems than matched controls.*

9. Kleinman RE, Murphy JM, Little M, Pagano M, Wehler C, Regal K, Jellinek, MS. Hunger in Children in the United States: Potential Behavioral and Emotional Correlates. *Pediatrics*. 1998; 101 (1): 3.

- *This primary research article found that children from families that report multiple experiences of food insufficiency and hunger are more likely to show behavioral, emotional, and academic problems on a standardized measure of psychosocial dysfunction than children from the same low-income communities whose families do not report experiences of hunger.*

10. Kubena KS, McMurray DN. Nutrition and the immune system: a review of nutrient-nutrient interactions. *J Am Diet Assoc.* 1996 Nov; 96(11):1156-64.

- *After presenting a brief overview of immune function, the authors consider reports that examine the impact of imbalances of various nutrients such as selenium, vitamin E, vitamin A, zinc and copper.*

11. McGinnis, JM, Foege, WH. Actual causes of death in the United States. *JAMA* 1993 270: 2207-2212

- *Pooling data from various sources, this paper examined nongenetic causes of death in the United States. I used it specifically to quantify the impact of diet on morbidity rates.*

12. Mendez M, Adair LS. Severity and Timing of Stunting in the First Two Years of Life Affect Performance on Cognitive Tests in Late Childhood. *Journal of Nutrition*. 1999;129:1555-1562.

- *This study used data from the Cebu Longitudinal Health and Nutrition Study of a sample of over 2000 children between 8 and 11 years to assess the relationship between stunting in the first 2 y of life and later cognitive development.*

13. Meyers AF, Sampson AE, Weitzman M, Rogers BL, Kayne H. School breakfast program and school performance. *American Journal of Diseases of Children*. 1989; 143: 1234-9.

- *Thus paper reviewed the effectiveness of a breakfast school program on academic performance in children.*

14. Mora JO. Nutritional supplementation, early stimulation, and child development. Abstract only. In: Brozek J, ed. *Behavioral Effects of Energy and Protein Deficits*. Bethesda, MD: US Department of Health, Education and Welfare (NIH); 1979.

- *Study that presents the statistic that students with the lowest amount of protein in their diet have the lowest test scores.*

15. Redd SC, Mokdad AH. Invited commentary: obesity and asthma—new perspectives, research needs, and implications for control programs. *Am J Epidemiol* 2002;155:198–202.

- *This paper discusses the link between asthma and obesity.*

16. Redline, S, Tishler, PV, Schluchter, M, Aylor, J, Clark K, Graham, G. Risk Factors for Sleep-disordered Breathing in Children: Associations with Obesity, Race, and Respiratory Problems. *Am. J. Respir. Crit. Care Med.*, Volume 159, Number 5, May 1999, 1527-1532.

- *This paper presents the correlational data which link BMI and neck circumference to sleep apnea in children.*

17. U.S. Department of Health & Human Services. The Surgeon General's Call To Action To Prevent and Decrease Overweight and Obesity.

http://www.surgeongeneral.gov/topics/obesity/calltoaction/fact_adolescents.htm.

updated: January 11, 2007. accessed: March 16, 2007.

- *The Department of Health and Human Services outlines the problem of overweight children, the causes of overweight, how to determine if children are overweight, and general suggestions for reduction of body fat.*

18. Wachs T. D. Relation of mild-to-moderate malnutrition in human development: correlational studies. *J. Nutr.* 1995; 125:2245S-2254S.

- *This review discusses research from correlational studies and determines that chronic, mild postnatal malnutrition is associated with a variety of cognitive and behavioral deficits across the life span.*

Annotated Bibliography for Students

1. Brown, Laurie Krasny and Marc Tolon Brown. *Dinosaurs Alive and Well: A Guide to Good Health*, Lebanon, IN: Hachette Book Group, 1992.

- *This book is a fun read with interesting characters that gives a great deal of lessons about topics such as proper nutrition, cleanliness, stress management, exercise, etc.*

2. Ehlert, Lois. *Eating the Alphabet*, New York: Harcourt, 1989.

- *This alphabet book has colorful pictures and labels for a wide variety of fruits and vegetables.*

3. Falwell, Cathryn. *Feast for Ten*, New York: Clarion Books, 1995.

- *A mother and her children shop and prepare a meal together in this visually appealing counting book*

4. Gregoire, Maryellen. *Morning Meals Around the World Day*, Mankato, MN: Picture Window Books, 2004.

- *This book has wonderful illustrations as well as simple, readable text- it shows what children from various countries/cultures eat for breakfast.*

5. Leedy, Loreen. *The Edible Pyramid: Good Eating Every Day*, New York: Holiday House, 1996.

- *This is a picture book featuring animals that come to a feast and order meals together- this book is important because it has a focus on serving size and making estimations.*

6. Lewin, Ted. *Market!* New York: Harper Collins Books, 1996.

- *Stunning illustrations take the reader through various food shopping experiences in different countries.*

7. Rockwell, Lizzy. *Good Enough to Eat*, New York: Harper Collins Juvenile Books, 1999.

- *This book presents facts about the importance of foods and nutrition in a simple and clear way.*

8. USDA. Home/ For Kids. 1 May 2007. <http://teammnutrition.usda.gov/Resources/mpk_poster2.pdf>

- *This website provides teachers with some great hand-outs for students; specifically, the food pyramid for kids can serve as a wonderful illustration of a balanced diet.*

9. Waber, Bernard. *Fast Food! Gulp! Gulp!*, Boston: Houghton Mifflin, 2001.

- *This story with rhyming text features animals eating fast food rapidly until the cook character chooses to slow down and eat and prepare healthier meals.*

Appendix: Pennsylvania Academic Standards

Literacy

- 1.1 Learning to Read Independently
 - E. Acquire a basic reading vocabulary by identifying common words.
 - F. Recall new vocabulary in listening and visual contexts.
- 1.3 Reading, Analyzing, and Interpreting Literature
 - A. Respond to and discuss a variety of literature through Read-Alouds and Shared Reading.
- 1.5 Quality of Writing
 - A. Write, draw or use pictures to depict experiences, stories, people, objects, or events
- 1.6 Speaking and Listening
 - B. Listen to a selection and share information and ideas.

Mathematics

- 2.1 Numbers, Number Systems, and Number Relationships
 - G. Use concrete objects to count, order and group.
 - I. Apply place-value concepts and numeration to counting, ordering and grouping.
- 2.4 Mathematical Reasoning and connections
 - A. Make, check and verify predictions about quantity, size and shape of objects and groups of objects.

Science

- 3.8 Science, Technology and Human Endeavors
 - A. Know that people select, create and use science and technology and are limited by social and physical restraints.
- 4.3.4 Environmental Health
 - C. Understand that the elements of natural systems are interdependent.
- 4.8.4 Humans and the Environment
 - A. Identify the biological requirements of humans.

Health

- 10.1.3 Concepts of Health
- 10.2.3 Healthful Living