Nutrition and Exercise: A Catalyst for Change

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Driving through the Third Ward to Lockhart Elementary School, I take note of my surroundings. On Scott Street are a McDonald's and a Taco Bell. Down the road I see Timmy Chan's, Popeye's Chicken and Burger King. Right across the street is a Frenchy's restaurant. What is not visible is a gym or a health food store.

Although there are many eating choices in our community, there seems to be limited choices of facilities in which to exercise. The structure of a community can lead to unhealthy lifestyles unless there is a catalyst that inspires change. Many children in our community have very unhealthy eating habits and lead very sedentary lives. Variables such as these can lead to childhood obesity and diseases such as childhood diabetes.

My goal as a teacher is to get children at an early age to be aware of what is going on inside of their bodies and to empower them to make healthy lifestyle choices. Lockhart is a small, Third Ward school of about 500 students. We are a magnet school that focuses on technology and the sciences. The school demographics are 98% African American, 1% white and 1% Hispanic. Eighty-five percent of our students are on free or reduced lunch and 22% of our students are considered at-risk. I am citing these statistics because it puts perspective on the type students with whom I work and how I can focus this unit to best fit these children's needs.

WHAT THIS UNIT SEEKS TO TEACH

With this unit, I plan to take a biology class and make it first grade friendly. Although the human body is not introduced until the 4th grade, students should learn about the relationship between what they eat and their overall health. For example, students should learn what happens to a hamburger once it is swallowed. This unit will teach first graders about the digestive system, proper nutrition and making healthy lifestyle choices. Also, students will be taught to value exercise as an important part of their daily lives and the way people maintain good health and a healthy lifestyle.

This three-week unit will introduce the parts of the digestive system such as the esophagus, stomach, small intestines and large intestine. The students will learn the function of each organ and how it aids in the digestive process. This unit will also allow the students to look at and analyze each part of the food pyramid. In studying the food pyramid, students should be able to answer the following questions: What foods belong in each group? What are the vitamins essential to each food group? How do these foods help us to maintain good health?

In addition, this unit will look at nutritional diseases such as diabetes and obesity. A large percentage of the African American community suffers from some form of diabetes, and it is very likely that at least one of my students either suffers from the disease or has a loved that does. By learning more about the diabetes, my students will have more knowledge on how to prevent the disease and how to take care of themselves. Finally, this unit will help my students make healthier lifestyle choices. They will be using the food pyramid to plan a well-balanced meal. They will be learning and actively engaging in the benefits of exercise. But most importantly, they will have fun. This unit is not designed to scare or stress students, but to empower them to make healthy lifestyle choices which will enable them to live a healthy long life.

WHY IS THIS UNIT IMPORTANT TO TEACH?

Cultural knowledge

The challenging aspect of this unit is in the cultural background of my students. I was reading an article in *Time* magazine about obesity, and one important factor that was linked to obesity and poor health is economics. It said that in America, the rich tend to be thin and the poor tend to be overweight. In America the less money you have, the likelier you are to be overweight. It does not make sense until you really think about the logic. In poor neighborhoods the cost of food is a major factor in how households stock their pantries. The best food bargains tend to be packed with sugar, fat and refined grains, such as cookies and candy bars. Instead of fresh vegetables, many lower income households buy processed vegetables in the can (Cullen 69).

Twenty-eight percent of Americans live in neighborhoods where the nearest supermarket is at least a 10-mile drive from their home. In these neighborhoods, it is easier for a family with no automobile to do their grocery shopping at convenience stores or gas stations. Schools in lower income neighborhoods are so low on funding that physical education classes are cut and many are making franchise deals with snack food and beverage makers (Cullen 69). At our school, the students only get one day a week of physical education, while snacks such as Fruitopia, hot fries and different brands of potato chips are very popular treats.

Children adapt to their surroundings. If I were to ask my students to locate McDonald's, they would do so with no problem. Unfortunately, if I were to ask my students to locate the local gym, they would not know where to find one. There are many households in which both parents have to work full time in order to survive. Many times, these parents can't afford to hire a babysitter or send their children to daycare so the children go home and care for themselves. After school, working parents would rather have their children stay inside watching TV than playing outside in rough neighborhoods. These latch key children are given the house key and are expected to care for themselves until Mom or Dad comes home. While waiting for Mom or Dad to get home, that child may sit in front of the television and watch hours of commercials that advertise foods,

such as sugary cereals and greasy burgers. A fast food restaurant down the street is too convenient for many of these children.

With my students, we will draw a map of our community. On our map, we will label Lockhart. We will also label all of the fast food restaurants in the area such as McDonald's, Burger King and Frenchy's. The students should be able to identify other landmarks such as Texas Southern University and the University of Houston, both of which are down the street from their school. Next we will label the health clubs or gyms in the area. Students will discover that there is no health gym that can be easily found in their community. Upon making this discovery, I would want to lead into a discussion that would answer the following questions? Why do you think our community is designed the way it is? How is this affecting us? What can we do to change things?

Scientific Knowledge

Texas schools spend so much time on reading and math that science is often forgotten or left behind. My biggest complaint as a teacher is that we spend too much time making sure that Johnnie can pass the TAKS or Stanford 10 test, leaving us no time to teach enough of other subjects such as science and health. So when Johnnie gets to high school, he fails biology because he missed the foundation that he should have received in elementary school. This lack of preparation hinders his success in high school. What I want to accomplish with this unit is to design a health science lesson that will incorporate reading, math and the health sciences. I want my students to know how their bodies digest food. I want them to know why their bodies digest food. Students need to know what vitamins and minerals are and how they can help their body to stay healthy. Because so many families are affected with diseases associated with excess weight, I want my students to learn about diabetes and obesity.

Ask any first grader (or some adults for that matter) to show where their stomach is located and they will point directly at their belly button. The exact location of the stomach is over to the left side of your body slightly behind the ribs. Knowing details like this is important. Would you want to be operated on by a surgeon who did not know exactly where your stomach was located? Through this unit, students will be introduced to the health science of the human body. They will learn exciting words such as digestion, esophagus, stomach, small intestines, large intestines (colon) and anus. They will learn that the food pyramid is not just a drawing of food inside of a pyramid. They will learn how they can use the pyramid to help them make healthy choices. This unit will teach why exercise is essential for maintaining good health. It will show children ways they can get their heart pumping. The long-term goal of teaching this unit to your students should be evident in the long-term health benefit they will learn.

Will this unit be a challenge to teach? Yes. Is this unit developmentally appropriate for a first grader? Yes. Teaching body parts to a 7 year old may seem like a huge challenge, but first graders are very curious little people. They like to talk and learn

about themselves, so given an opportunity to learn about what is going on inside of their own bodies; they should be very interested and curious.

Making School Fun

Another reason this unit is important to teach is because it deviates from the monotony of teaching reading, math and writing all day. The reason many children feel bored with school is that they are doing the same thing everyday. Principals are pressured to improve their schools. As a result, teachers are so concerned with improving test scores and making sure that they are leaving no child behind that, as a result, the children feel the pressure and school is no longer a fun place to learn anymore. If a student can't have fun learning at school, then where else can they go to have some fun?

Houston Independent School District First grade's Health Education goal is to "understand the relationship of body systems, nutrition and disease to personal well being" (Project Clear Curriculum 2.0). This unit is intended for use as part of the health science curriculum in my classroom.

TEACHING STRATEGIES

It is my intention that this unit be teacher friendly as well as student friendly. In this unit, the students will be introduced to the human body through literature. I plan on using Joanna Cole's the *Magic School Bus* to motivate my lesson. I love reading the *Magic School Bus* by Joanna Cole. Ms. Fizzle is the wackiest schoolteacher I have ever come across, and I often wished that I had a teacher like her when I was a child. As eccentric as she is, she always taught me something about science. In *The Magic School Bus: Inside the Human Body*, Ms. Fizzle literally takes her students on a tour inside of the human body. It is a very comical journey, but at the same time, it is a very educational one. I plan on taking my students through that same journey. As an educator, I've always felt that children's literature is a good motivator for a good lesson. Using this book, I hope to develop a unit that will teach first graders about the parts of the body that make up the digestive system and how the body uses food as a source of energy, at the same time emphasizing the importance of proper nutrition.

During week one, the students will be learning about the digestive system. They will identify and locate parts of the digestive system, such as the teeth, tongue, esophagus, stomach, small and large intestines. The students will also learn the function of each organ that plays a part in the digestive system. In this part of the unit, I will use visual aids, such as pictures, posters, models and drawings of different organs of the digestive system, including the teeth and tongue, esophagus, stomach, and small and large intestine.

In week two, the students will be introduced to the food pyramid. I will use pictures of the food pyramid and different foods within the food pyramid, such as the bread

groups, fruit and vegetable group, meat group, dairy group and fats and oils. The students will be learning about each food group, what nutrients are provided by this food group and how these foods help the body grows.

During the last week of this unit, the students will look at the effects of poor nutrition and learn to make healthier choices for their diet. They will be learning about nutritional diseases, such as diabetes, obesity, and vitamin deficiency diseases, such as scurvy. Students will be planning healthy meals, choosing exercise options and learning about the benefits of having good health.

BACKGROUND INFORMATION

Understanding the Digestion System

Introducing the Unit

This unit will begin with a discussion. In order to get a feel of what my students already know about their bodies, I will start a K-W-L chart. A K-W-L chart is a graphic organizer designed to see what students already know about a topic before the beginning of the unit by asking the students what they already **k**now. Students are then allowed to explore their curiosity by asking questions about what they **w**ant to know. Finally, after the completion of the unit, the chart allows students to go back and discussed what they **l**earned. See the example below.

K	W	L

This week we will be reading about a silly school teacher that teaches us about the insides of our body. There are many parts of our bodies that help us grow. What do you know about your bodies? Before I introduce *The Magic School Bus Inside the Human Body* by Joanna Cole, I will begin filling out the K-W-L chart.

First, I have students think about what they know about their bodies. Then I will have them discuss with a partner what they know. Then I will have students share what they know with the class. This strategy is called think-pair-share. Once we share our responses, I will record them under the K part of the K-W-L chart. What do you want to learn about your body (Use think-pair-share)? At this time I record student responses under the W part of the K-W-L chart. We will return to the W and L parts of our graphic organizer after the completion of our unit.

Next, I will introduce the word digestion. What is digestion? Digestion is the process our body uses to break down foods to provide us with energy. It can be

compared to a factory that dismantles food. Digestion involves both physical and chemical processes. The first step of digestion is chewing and is both a physical and chemical process that begins in the mouth.

LITERATURE-BASED CURRICULUM

This unit integrates reading and science. The teacher will read *The Magic School Bus: Inside the Human Body*, by Joanna Cole to the class. The reading will be paced so that each part of the digestive system is introduced with supporting activities. The students will need to keep a journal to record their observations and discoveries.

The Tongue and Teeth

Digestion begins as soon as food enters the mouth. The teeth break the food into smaller pieces (physical change). The tongue facilitates the movement of food inside the mouth and mixes with saliva, an enzyme that turns starch into sugar (chemical change). Salivary glands provide saliva which the tongue mixes with food to make it soft. The tongue contains tiny bumps called papillae which contain the taste buds. Taste buds have a dark, round opening called a taste pore. Food that is dissolved entering the taste pores is detected by the taste buds below it (Royston 13).

Students will be provided with a mirror that they will use to examine their own mouths closely. They will notice that all of their teeth are not the same shape. Different shaped teeth have different jobs to do. I will point out to my students that the front teeth are called *slicers* which slice into food; the *grippers* grip the food and tear off a bite. *Tearers* tear and grind food and the *grinders* grind against each other like milestones to reduce the food to a pulp. After close examination of their teeth, the students can write about each function of the teeth in their student journals.

The Esophagus

What happens to food after it is swallowed? Yes, it goes down the esophagus. The next part of the body that aids in digestion is the esophagus. The esophagus is not your throat. The throat (or *pharynx*) acts as a passageway for food and air. It is located at the base of your tongue. Once the food is soft and mushy, this is called the *bolus*, the tongue pushes it down to the throat. When food is swallowed a flap inside of the throat called the *uvula* blocks food from entering the cavity region. Once food journeys through the throat, it is pushed down into the esophagus. Your esophagus contains muscles that push the food down to the stomach. This is similar to squeezing tooth paste out of a tube. This muscle in the esophagus makes it possible to swallow your food even when you are upside down (Walker 14).

Before you begin your discussion of the esophagus, refer to page 8 of the *Magic School Bus*. Have students identify the esophagus on their bodies. You will need to

explain that the esophagus and the throat are not the same. When you are explaining how the esophagus works to students, mention that the esophagus squeezes food down to the stomach like we squeeze toothpaste out of a tube. You can demonstrate this by squeezing a ball of paper through a straw. For a full lesson about the esophagus, see the lesson plans section of the unit.

The Stomach

The stomach is a J-shaped bag that expands to store food. The wall of the stomach contains muscles. These muscles squeeze and churn the food mixing it with gastric juices. Inside of those gastric juices is a chemical called a *hydrochloric acid*. This acid is so strong that it could eat into the stomach itself. Luckily for us, we have a jelly-like lining called mucus that protects our stomachs from these acids. The entire digestion process in our stomachs takes 1-2 hours. Once the food is broken down into a thick soup-like liquid, it passes into the small intestines (Burgess 19).

Before you begin your discussion of the stomach, refer to pages 9-10 of the *Magic School Bus.* The stomach is a major organ in our digestion system. Ask students to locate their stomachs. If students point to their belly buttons, show them that their stomachs are actually to the left side of their bodies slightly below the ribs. You will need to provide drawings or diagrams of the digestive system and to show students where the stomach is located. You can find these in your local library or from the science lab teacher at your school. Have students trace an outline of the human body and show where they would find their stomachs in their journals. Have students write about the function of the stomach to accompany their illustrations.

The Small Intestine

The small intestine is a coiled up hollow tube the can be up to 25 feet long inside of an adult. The small intestine finishes up the job of digesting food (Stille 18). Acids from other organs in your body help to further break down food in the small intestine. Your small intestine also has muscles along its walls that pushes and breaks down food. The parts of food that are broken down are absorbed through fingerlike item called *villi.* Through the villi, nutrients enter the blood stream to provide nutrients to our body. This keeps us alive. It takes about 6 hours for the food to go through the small intestine.

As you begin your discussion of the intestines, refer to pages 11-12 of *The Magic School Bus*. Explain to your students that the small intestines further breaks down the food that comes from your stomach. Its job is to take out the nutrients which are essential in order for your body to function. To demonstrate the length of the small intestine, get a ball of yarn. The small intestine is about 25 feet long (7.5 meters). Roll out the ball of yarn to demonstrate 25 feet. Have the students' record observations in their digestion system journals. To further extend the discussion, have students think about how our

bodies would look of our intestines were stretched out in our bodies. Have students illustrate in their student journals.

The Large Intestine

From the small intestine, any food still not digested enters the large intestine. The large intestine is also a tube of muscle and other tissue. It is also called the *colon*. At only 5 feet long, it is much shorter than the small intestine but wider. While it only takes 6 hours for food to go through the small intestine, it can take a whole day (up to 20 hours) for food to pass through the large intestine. The large intestine removes water from undigested food and fiber (Stille 27). It also takes vitamins and minerals. Whatever left over from the food is called *waste*. The waste is moved along the large intestine by its muscle lining until it finally reaches the rectum and exits the body through an opening called the *anus*. This is the final process of the digestive process.

Have students think about their large intestine. Have students compare and contrast the purpose of both organs. Have students note that like the small intestines, the large intestines also breaks down food into smaller parts. It also takes out and distributes essential nutrients needed in order for the body to be healthy. Unlike the small intestines, the large intestine is shorter but a lot wider. It also takes a longer time for food to digest in the large intestine. You can demonstrate the length of the large intestine using a ball of yarn (5 feet). Have students add on to their body outline by drawing and labeling the large intestine. You may need to assist some of your students with their illustrations.

Refer to the *Magic School Bus* by Joanna Cole when completing the K-W-L chart that was started earlier this week. Review with students what they knew about their bodies and review what they wanted to learn about their bodies. At this time, discuss with students what they've learned from about their bodies from what was taught. Discuss with the class why Miss Fizzle from the *Magic School Bus* took her class on the journey through the body. Fill in the "learn" part of the graphic organizer as students tell you what they learned.

THE BENEFITS OF GOOD NUTRITION

Welcome to week two of our unit! This week we will be learning about the benefits of good nutrition. A guide for having a balanced diet is the food pyramid. The food pyramid is a guide for good eating habits. The food pyramid was developed in the mid-80s by the U.S. Department of Agriculture (USDA), a federal agency whose aim include eradicating hunger and malnutrition. The purpose of developing a food pyramid is to help people improve their health (Kalbacken 5).

To get the lesson started, have the students think about what they already know about nutrition and eating a healthy diet. Then I will have them discuss with a partner what they know. After discussions the students share what they know with the class. Once we share our responses, I will record them under the K part of the K-W-L chart. Next, I will

ask the students what they want to learn about nutrition. At this time I record student responses under the W part of the K-W-L chart. We will return to the K-W-L chart after the completion of our studies.

Children of different age groups have different nutritional needs; therefore, it would be impractical for the food pyramid to be adapted for children of all age groups. The food pyramid has been modified for children between the ages of 2 and 18. The Dietary Guidelines Advisory Committee has identified the best age group to target for an adapted Food Guide Pyramid for Children. In pre-school age children (ages 2 through 6) the USDA recommends the least minimal number of servings from each food group with the exception of the milk group. As children get older, they will need more servings to accommodate their growing bodies (Saltos 3).

As a child grows older, their diets start changing. They tend to neglect one food group while consuming too much of another. For example, older children tend to fall short of their fiber and calcium recommendations but exceed the recommendations for total and saturated fat. Adolescent females have the greatest problems in meeting their nutritional requirements. As educator, it is our job to teach and reinforce the importance of a balanced diet in the classroom. Many elementary children think nutrition is important but don't act on it. We still have the power to reach these children by what we do in the classroom (Saltos 13).

The Food Pyramid

A pyramid is a five-sided solid figure with a square base and four sloping sides. Each side is the shape of a triangle. The food pyramid is divided into six sections. Resting at the bottom of the pyramid is the bread and cereal group. The carbohydrates come from this group. The next levels of the pyramid are the fruit and vegetable groups. These are the foods that come from plants and contain the vitamins. The next level on the pyramid is the milk and yogurt group. These are your dairy products. The meat group comes next on the pyramid. These foods provide the proteins but can also contain a lot of fat. Finally, at the top of the pyramid are the fats and oils. Foods from this group should be eaten sparingly because it contains lots of fats and sweets.

Breads, Cereal, Rice and Pasta Groups

The breads, cereal, rice and pasta groups contain carbohydrates which gives us the energy we need to stay physically active. Carbohydrates are also one of the three main nutrients that we need in order to live. "Carbohydrates are chemicals in food that are made of carbon, hydrogen and oxygen, and come mainly from plants" (VanCleave 11). There are two kinds of starches: simple and complex. The breads, cereal, rice and pasta group rest at the bottom of the food pyramid because we need the most servings from this group. A serving is one portion. According to the pyramid, we need 6-11 servings per day from this food group. Recent studies have shown, however, that eating too many carbohydrates is a major source of weight gain. The Atkins diet encourages you to severely limit your

intake of carbohydrates and consist of primarily eating proteins and fat in order to achieve weight loss. The Atkins plan even has a modified food pyramid for people watching their carbohydrate intake.

It is important to have students identify what a carbohydrate is and identify foods from this group. Display a large poster of the food pyramid to assist you with your explanation of the dairy group. Ask students if they recognize any of the foods from this food pyramid. You can have the students find pictures of food from this food group in magazines and make a collage. After making their collages, give students the opportunity to discuss what they found.

Fruit and Vegetable Group

The second level of the pyramid comes from plants. This is the fruit and vegetable group. According to the pyramid, we need 3-5 servings from the vegetable group and 2-4 servings from the fruit group everyday. Vegetables are good for eyes, skin, ears, nose and throat. They contain lots of vitamins. These vitamins help to heal cuts and bruises (Kalbacken 14). Vegetables come from different parts of plants. Vegetables come from flower stems, leaves, seeds or even the roots of plants. The fruit group helps our teeth and gums. Fruit also provide vitamins for growth and healthy skin as well as fighting sickness. Eating fruits and vegetables reduces cancer by 20%. Vitamin C, which helps fights diseases, comes from citrus fruits, such as oranges, grapefruits, lemons and limes. Fruits are grown from trees or vines.

Only one in five children consumes the recommended 5 servings of fruit and vegetables each day. Children from lower income families do not get enough fruits and vegetables. Research have shown that children from families with higher income consumed more fruits and vegetables compared with children from families with lower income. Most of the vegetables consumed in this food group come from French fries (Saltos 8).

It is important that children understand the difference between a fruit and a vegetable. You can bring some fruits and vegetables from home. Have students examine fruits and vegetables. Have students identify fruits and vegetables on the food pyramid. Ask students how they can tell a fruit from a vegetable. A vegetable is any edible part of a plant such as the roots, stems or leaves. A fruit is a part of the plant that contains the seeds. A tomato is an example of a fruit. A potato would be an example of a vegetable. After you discuss the differences between a fruit and a vegetable, cut them open so students can see that a fruit has seeds inside of it and a vegetable does not. Have the students record their observations in their food journals.

Milk, Yogurt and Cheese Group

Level three of the food pyramid consists of two parts. One part of the 3rd level contains the milk, yogurt, and cheese group. We need 2-3 servings per day from this group. This

group is what we call the dairy products. The dairy products include cheese, yogurt, ice cream and milk. Milk is an excellent source of calcium. Calcium supports bone growth, muscle contraction, strong teeth and a healthy nervous system. It is recommended that small children drink plenty of milk to build strong bones and teeth, but it is also good for adults to drink milk for health reasons as well. Including milk as part of your diet prevents osteoporosis. Osteoporosis is a condition of weak, brittle bones that break easily (Walker 55). This disease affects over 10 million people and most of them are women over 50.

Have your students identify the dairy products on the food pyramid. A couple of questions you can ask your students are: Why this food group is important for growing children? Where does milk come from? What kinds of food are made with milk? You can record the student responses on an overhead or chalkboard. After the class discussion, the students can record their responses in their food journal.

Meat, Poultry, Fish, Dry Beans, Eggs and Nuts Group

The second part of the third level of the food pyramid is the meat group. According to the pyramid, you need 2-3 servings per day from this food group. The foods included in this group are fish, beef, chicken, eggs and nuts. These foods contain proteins. Proteins are chains of amino acids which supply energy and build muscle, skin and internal organs. Amino acids are the building blocks of cells. A large amount of your body is made from proteins. The human body is 20% protein and 60% water. This includes your skin, nails, hair, blood and muscles. Many foods from this food group contain fat. Too many fats lead to high cholesterol and heart disease, so eat sparingly.

Have your students identify foods from the meat group on the food pyramid. Remind students that protein comes from this food group which is another major nutrient that we need in order to live. Using the food pyramid, you can ask your students the following questions: What kind of food contains proteins? Can protein only come from meat? What would happen if you had no proteins in your diet? You can record the student responses on an overhead or chalkboard. The students can find foods in magazines from this food group. After the class discussion and activity, the students can record their responses in their food journal.

Fats, Oils and Sweets

The top level of the food pyramid is the fats, oils and sweets group. This food group contains a lot of fat and has no nutritional value, so we should eat foods from this group sparingly. In this food group you will find potato chips, fried food, candy, cake, ice cream and cookies. Although these foods have no nutritional value, they can provide us with "spurts" of energy. Too much fat and sugar in our diet with no exercise can lead to obesity. Obesity occurs when a person is dangerously overweight. Being dangerously overweight can lead to diabetes and heart problems.

Fat in your diet is not a bad thing though. Fat keeps the body warm and provides us with the energy we need to keep us alive. Fats can be sorted into two groups. These groups are saturated and unsaturated fats and oils. Most foods which contain saturated fats come from animals. For example, foods such as milk products, eggs and the fats found in meat contain saturated fats. Unsaturated fat comes from plant parts, such as seeds, fruits and vegetables. Cholesterol is a type of fat found in our blood. Cholesterol helps the flow of carbon dioxide in our blood. When there is too much fat in the blood (high cholesterol level) it starts to stick to the inside of your arteries. This can lead to a heart attack.

Many of our favorite foods are found in the fats, oils and sweets group. Have students identify foods from this food group on the food pyramid. Some examples would be doughnuts, candy, soda, and just about anything fried. Have students discuss why so many people enjoy eating food from this group. Children must understand that not all fat is bad. Fat is essential for good health. Fat insulates the body, serves as cushion to protect us from injury and keeps us warm. Have the students find foods in magazines from this food group and make a food collage. Students can record what they learn about fats in their food journals.

Pretend that the class is opening a healthy fast food restaurant. In groups, have students plan a well-balanced meal using all of the food groups from the pyramid. Discuss if we really need to add foods from the top of the pyramid. Make up and design a menu of the meals that the children planned.

Wrap up this week's lesson by referring back to the K-W-L chart that was started earlier this week. Review with students what they already knew about nutrition and review what they wanted to learn about nutrition. At this time, discuss with students what they learned about each food group and the importance of each food group. Fill in the "learn" part of the graphic organizer as students tell you what they learned.

THE EFFECTS OF POOR NUTRITION AND MAKING HEALTHY CHOICES

Welcome to the final week of our unit! We've learned about the digestive system and the food pyramid. Now its time to tie it all together! The students will apply what they've learned from this unit to their everyday lives. This week we will learn about the harmful effects of a poor diet and how we can make healthy choices that can impact our lives.

To get the lesson started, have the students think about what they already know about exercise. Have the students think about what happens when we eat too much and don't exercise enough. Then have them discuss with a partner what they know. After discussions the students share what they know with the class. Once we share our responses, I will record them under the K part of the K-W-L chart. Next I will ask the students what they want to learn about exercise and diet. At this time I record student

responses under the W part of the K-W-L chart. We will return to the K-W-L chart after the completion of our studies.

Obesity

Obesity is a condition of excessive weight. This happens when the body's intake of energy (calories) surpasses its needs. The body stores this extra energy in the form of fat. Too much fat with no exercise leads to excessive weight gain. Two-thirds of the United States adults are officially overweight. One in six children is overweight. Excessive weight takes its toll on the body. The heart has to work harder and faster to pump blood throughout the body. Obese people face medical complications, such as heart disease, high blood pressure, stroke, diabetes, infertility, gall bladder disease, osteoarthritis, and many forms of cancer. In addition to health factors, overweight adults and children deal with low self-esteem issues (Lemonick 59).

Our school sponsored a health fair during the spring semester. During the fair, many of the children were weighed. Surprisingly many of our first graders weighed 100 pounds or more. There was a second grade student that weighed 201 pounds. I wondered to myself how a 7 year old can weigh so much. Then I thought about Calvin.

Calvin is a first grader at my school. Every morning he comes to school with a breakfast from McDonalds. After he eats his McDonalds' breakfast, he gets a school breakfast. At lunchtime, Calvin is often begging others for their lunches after he finishes his. Because Calvin's mother is a student, he is not involved in many extra curricular activities once he gets home. Calvin's stomach hangs way below his beltline. At seven years old, it is not too late for Calvin to lose weight, but he must make some lifestyle choices.

On this day, we will discuss the cafeteria menu in the school cafeteria. What are some of the choices of food offered on the menu? What food group does this food comes from? Have your students record what they eat for lunch for one week. At the end of that week, put each item that was eaten into a food group. For example, if the student had baked chicken for lunch, that would go in the meat group. If the student had hot fries for lunch, that would go in the fats food group. Create a bar graph of what the students ate. Which food group had the highest number of foods consumed? Ask the students how do their diets affect their weight? Are there any changes that can be made to improve how they eat? You can have your students record their responses in their food journals.

Diabetes

Diabetes is a disease that affects the way our body uses food. A healthy body turns carbohydrates such as breads into glucose. We need glucose or blood sugar, for energy. The bloodstream delivers glucose to body cells. Then it waits for the pancreas to do its job which is to make insulin (Peacock 6).

In diabetics, the body makes glucose as usual, but something goes wrong. In some cases, the pancreas makes too little insulin or none at all. In other cases, the pancreas makes insulin but the body doesn't use it well. Either way, glucose cannot enter the body's cells. As a result, it builds up in the blood and eventually passes out of the body in urine.

There are two types of diabetes. **Type 1 diabetes** (insulin-dependent diabetes) occurs when the immune system mistakes insulin-producing cells of the pancreas for foreign invaders and destroy them. Very little or no insulin is produced. As a result, glucose remains in the blood and body cells starve because they are deprived of an energy source. Because of the high glucose level in the blood, the kidneys are also disrupted. **Type 2 diabetes** (insulin-resistant diabetes) occurs when the pancreas makes enough insulin but the body cells resist its action. Cells become starved for glucose because it is rejecting it. The pancreas produces more insulin and the cells continue to resist it. Eventually, the cells stop working. In the meantime, high concentrations of glucose take its effect on the body. Side effects include blurred vision, cuts and bruises that heal slowly, or numbness and tingling in feet or hands (Brynie 75-77).

Type 1 diabetes is unpreventable, but Type 2 diabetes is preventable. Type 2 diabetes is strongly associated with obesity. Fat cells secrete a signaling molecule called resistin. The more fat cells the body produces, the more resistin is made. The muscle cells become more insulin-resistant as a result of having more resistin. Resistin is the hormone that links obesity to diabetes. Since four out of five people who develop Type 2 diabetes are overweight, the conclusion is apparent. Too many fat cells produce too much resistin (Brynie 78-79).

Trevon is a first grader that suffers from Type 1 diabetes. He has to take insulin shots daily. With the help of his mother and grandmother, he carefully monitors his diet. Many of my students do not understand diabetes and why Trevon cannot eat certain foods. During the spring semester, a nurse from Amerigroup came to our school to speak with our first graders about diabetes. She showed a short film about diabetes and had a short discussion after showing the film. I was not surprised to find that many of my students have a family member that suffers from some form of diabetes. After the presentation, the nurse gave each student a booklet and some information about diabetes. It was a very informative presentation, and I felt that my students learned something about this disease. To learn more about diabetes, call Amerigroup at 1-800-600-4441 or visit the web site <http://www.diabetes.org>.

Other Nutritional Diseases

Diabetes is not the only disease you can get as the result of a poor diet. Nutritional diseases fall into four categories. The first one is inadequate energy intake. Diseases such as malnutrition and starvations fall into this category. The second type is too little protein. This category usually accompanies the first. The third type of nutritional disease

is a shortage of several vitamins or minerals. One example of a vitamin deficiency disease is scurvy. Scurvy is caused by a lack of vitamin C. It is a nutritional disease that causes swelling and bleeding of gums and skin. Anemia is another nutritional disease which results from a lack of iron. The fourth type of nutritional disease is nutritional excess or obesity.

Tie in nutritional diseases when discussing food and nutrition with your students. Discuss why it is important to have a well-balanced diet. Discuss countries where children suffer from malnutrition. Why do people from some countries suffer from malnutrition? Help students to see that all agricultural climates are not the same, so as a result, some countries are not able to grow their own food. After the class discussion, give students a writing prompt responding to what was discussed in class.

Drinking Lots of Water

Most people don't think of water as nutrient but it is actually the most important one. Our body is made up of 55-85% water. Water carries things around in the body. It keeps the body temperature normal. It cushions and protects important organs such as the brain. We need water because the body loses an average of 8-12 cups of water each day. Half of the water in our body is lost when we urinate. We can go weeks without food, but we cannot survive 2 or 3 days without water. Most of the food we eat contains water. Fruits and vegetables contain about 70-95% water. Milk contains about 87% water and eggs contain about 75% water (Silverstein 28-29).

Making Healthy Lifestyle Choices by Exercise

Children are aware of the importance of eating a good diet and doing physical activity. When children are more active in sports, they tend to pay more attention to what they eat. In 1969, 80% of children played some kind of sport everyday. Today only 20% of children participate in some kind of sport daily. When children are not active, they develop poor eating habits and have a tendency to gain weight faster. There are many benefits to being physically fit. A person that is physically fit has a strong heart and lungs that provide lots of oxygen to all parts of the body. This person has the strength and energy to do many things, such as chores and sports. Being in shape gives you strong, firm muscles and just the right amount of body fat and flexible joints (Reef 6). It also helps you to feel good about yourself. It gives you confidence and a higher self-esteem.

As you exercise, several body systems work together. People who work out use their muscles, heart, lungs, bones, joints and blood vessels. Exercise also increases flexibility. Flexibility is the ability to move muscles and joints through their full range of motion. You want to develop a comprehensive exercise program that will work all body parts. As you exercise, your goal should also be to increase flexibility. The more flexible you are, the better you are able to recover from injury. As you discuss exercise with your

students, you want to emphasize all of the benefits that come with exercise. If physical education is not offered daily at your school or at all, take your students outside for 20-30 minutes and get them moving. Exercise habits are easier to develop in young children than in adults. Now is the time to get them moving!

To demonstrate to students how exercise affects the body, have students sit still and put their hands over their hearts. Have students run in place for one minute and then put their hands over their hearts. Make sure students know where their hearts are located on their bodies. Discuss the difference in the heartbeat before and after running. Ask and discuss why their hearts beat faster after physical activity. What happens to your body if you continue to exercise daily? How does it help your heart? Have students record their responses in their journals.

Wrapping up the Unit

Wrap up this week's lesson by referring back to the K-W-L chart that was started earlier this week. Review with students what they already knew about nutrition and review what they said they wanted to learn about nutrition. At this time, discuss with students what they learned about each food group and the importance of each food group. Fill in the "learn" part of the graphic organizer as students tell you what they learned.

LESSON PLANS

Lesson One: The Cracker Experiment

Objectives
The student will learn about and understand the chemical processes involved in the digestive process. The student will understand that the process of digestion begins in the mouth.

Materials
Crackers and student journals

Procedure
Hand a cracker to each student and ask him or her to chew the cracker for one minute before swallowing. Ask students to notice what happens to the cracker as they chew. What are your teeth doing? What is the purpose of the tongue? Discuss student responses. Students should notice that the cracker is broken into smaller pieces and was moistened and softened by the saliva and the taste became sweeter. This is happening because as you chew the cracker, it undergoes a chemical change. The saliva changes the cracker from a starch to a sugar. As a result, the cracker will become sweeter the more you chew it. Have the student record observations in his/her student journal.

Lesson Two: How the Esophagus Works

Objective
The student will learn about the role of the esophagus in the digestive system.

Materials
Straw, ball of paper, student journal, drawing paper

Procedure
To begin your lesson reread pages 7-8 of the *Magic School Bus: Inside the Human Body* by Joanna Cole. Have students draw a picture of their esophagus showing how it pushes food down to the stomach. Ask students what would happen if we did not have an esophagus. The students will record responses in student journals.

To demonstrate how the esophagus works, take a small ball of paper that will fit into the straw without falling through. Have students push the ball into the end of the straw and keep squeezing the straw behind the ball to make it come out of the other end. Explain that the ball of paper going down the straw represents how the food travels down the esophagus. Have your students record their observations in their student journals along with illustrations.

Lesson Three*:* The Chicken Bone Experiment

Objective
The students will observe and understand what the stomach does to food once it enters the body.

Materials
Chicken bones, gloves, vinegar, water, 2 large glass jars and student journals

Procedure
In this part of the unit, the students will view a demonstration of what the stomach does to food once it is inside the stomach. Explain to students that their stomach contains hydrochloric acids which break down foods before sending them to the intestines. This acid is strong enough to break down solid foods to a soup-like liquid but not strong enough to harm your stomach. To demonstrate to first graders what the stomach does to food, you will need chicken bones, vinegar and water. Pour vinegar into a jar and label it *vinegar*. In another jar pour in water and label it *water*. Place a chicken bone in each jar (use gloves when handling the chicken bones). Explain to the students that the jars represent their stomachs. Ask the students what they think will happen to the chicken bones. Have students record their predictions in student journals. After a couple of days (1 week) observe the chicken bones. The chicken bone in the water will remain the same while the chicken in the vinegar will take on a rubbery texture. Ask students why they think this happened. The students will record their responses in their student journals.

Lesson Four: Modeling how the Intestines Work

Objective
The students will understand the role of the small intestines and large intestine in the digestive system.

Materials
Ball of yarn and measuring tape

Procedure
To illustrate the length of the intestines, take a ball of yarn and roll it out to measure 25 feet (small intestine) and roll another ball out to measure 5 feet (large intestine). After measuring yarns with measuring tape compare the length of the small intestine to the length of the large intestine. Discuss with your students the even though the small intestines are long, it is not as wide as the large intestines. Ask students how do they think something as long as the intestines could fit inside of their bodies? How would we look if our intestines were stretched out in our bodies? The student will record observations and responses in their student journals.

Lesson Five: Water versus Coca-Cola

Objective
TEKS 115.3.b.8. Influencing Factors. The student understands factors that influence the health of an individual.

Materials needed
Marigold plants
Water
Coca-cola soda
Student journals

Procedure
Water is a pure nutrient with no additives. Even though Coca-Cola is something we can drink like water, it contains lots of sugars and additives that can be harmful to the body when drinking in access. In an experiment we will take 4 plants and water accordingly.

1 Plant one will be watered daily with pure tap water
2 Plant two will be watered with a mixture of coca-cola and water
3 Plant three will be watered with cola
4 Plant four will receive no water

To begin my lesson, I will have my students make predictions about which plant grow to be the healthiest. Which plant will show the poorest results? Next, we will record our predictions in our student journals. After 1-2 weeks of observations, the students

should see a difference in the plants. Have the students record their results in their journals. After studying and observing the results, we will discuss how this experiment relates to our bodies and why it is important to drink plenty of water.

Lesson Six: Building a Food Pyramid

Objective
TEKS 115.3.b.7. Health Information. The student is expected to describe and practice activities that enhance individual health such as sleep, nutrition and exercise.

Materials needed
A poster of the food pyramid
Samples of food from each food group
Magazines
Scissors and glue
Large butcher paper or art paper
Markers or crayons

Procedure
The lesson begins with a discussion about nutrition. Nutrition is the processes by which an animal or plant takes in and utilizes food substances (*Merriam-Webster Online*). We will discuss and brainstorm the types of food that make us healthy and help our body to grow. After this discussion, I will introduce the food pyramid. I will allow my students to discuss with one another and discover from which food group we need the most foods. At this time, I will give my students magazines with pictures of food and let them find and cut out pictures of foods from each food group. After we find all of our foods, we will re-construct the food pyramid on large butcher paper. I will draw a large pyramid and section it to show each food group. Next the students will paste the foods in the appropriate place on the food pyramid. You can do this activity whole group or allow the children to work in small cooperative groups. After the completion of our projects, we will close the lesson by discussing why each food group is important for a growing body. Then I will display the students' work.

Lesson Seven: Building an Exercise Pyramid

Objective
TEKS 115.3.b.7. Health Information. The student is expected to describe and practice activities that enhance individual health such as sleep, nutrition and exercise.

Materials needed
A poster of the exercise pyramid
Health or exercise magazines and student journals
Scissors and glue
Large butcher paper or art paper
Markers or crayons

Procedure

The lesson begins with a discussion about the importance of getting plenty of exercise. I will explain to my students that children need at least 15-30 minutes of cardiovascular activity daily. I will explain to my students that getting a cardiovascular workout means working the heart. We will brainstorm some physical activities that make your heart beat faster, such as running, jogging, playing sports or swimming. Next I will introduce the exercise pyramid. Explain the exercise pyramid is similar to the food pyramid, but it is a guideline that allows us to incorporate exercise into our lives.

I will display a poster of the exercise pyramid and go over each level. The bottom of the pyramid is daily routines. This includes chores such as grocery shopping, house cleaning, washing the car, mowing the grass and going to school. We will role play the activities from the bottom of this exercise group. To role play these activities, I can either take the students outside to an open space or find an open space in the classroom. The second level from the bottom is the aerobic, flexibility and strength exercise. These activities include weight and strength training, running cycling, swimming and aerobic exercises, such as jumping jacks. I will demonstrate and have the students do some of the activities from the second level of the exercise pyramid. The next level of the pyramid is recreational activities. These activities include sports, dancing, biking, hiking and karate. I will demonstrate and have the students do some of the activities from this level of the exercise pyramid. Finally, the last level of the exercise pyramid is rest. These include sitting down activities such as working on the computer, talking on the phone or watching TV. I will have the students demonstrate and role doing the activities from the top of the pyramid. Finally, I will have my students recreate the exercise pyramid in their student journals by cutting out pictures of people being active in magazines and pasting them unto the exercise pyramid. Then we will talk and write about each level and why it is important for growing bodies.

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