

# Nutrition ©

## <Lesson Plan>

*Grade 8*

H.E.L.P. for Kids 2008-2009

### **Teaching Messages:**

1. The basic nutrients that provide energy are carbohydrates, proteins, and fats. The amount of energy provided by foods can be expressed in kilocalories (kcal).
2. Although they do not provide energy, vitamins and minerals are nutrients we need in order to stay healthy. Fibers are also important for our health.
3. The digestive system is where the foods we eat are broken down, nutrients absorbed, and wastes excreted.

### **Required Materials:**

- Laptop and Projector

### **Recommended Materials for Small Group Activities:**

- Examples of foods rich in carbohydrates, proteins, or fats
- Sorry! Nutrition Edition game board
- Sorry! Nutrition Edition flash cards
- Team pieces/runners

To stay healthy, we need to pay attention to the Health Triad – Nutrition, Exercise, and Sleep.

Today we begin with **Nutrition**:

Eating is essential for us to survive and function. All cells in our body need energy to survive, grow, and function. Food is the *only* source of energy for us.

Eating the right foods allows us to reach our potential. Right nutrition combined with a healthy lifestyle helps us study and concentrate, improves our performance in sports, allows us to grow to our maximum height, keeps our skin, hair, and nails looking healthy and can even improve our mood. This is why it is so important for us to learn and understand as much as possible about what essential nutrients we need, how our body uses them, and how what we eat affects how we look, how we feel, and how well we perform our different tasks.

### **Activity 1 – Exploring Nutrients (10 mins)**

#### **Teaching Message #1:**

**The basic nutrients that provide energy are carbohydrates, proteins, and fats. The amount of energy provided by foods can be expressed in kilocalories (kcal).**

Everything our body does needs and uses energy. Energy is expressed as kilocalories, kcal or Cal. By definition, a calorie is the amount of heat necessary to raise the temperature of 1 gram of water by 1°C.

The *only* source of energy we get comes from the foods we take in. The nutrients that provide energy are carbohydrates, proteins, and fats. Different nutrients provide us with different amounts of energy or kcal.

For this activity, you will introduce the class to the nutrients we need to survive: carbohydrates, proteins, fats, vitamins, minerals, and fiber. Present examples of foods that are rich in each of these nutrients. Lastly, as a challenge, show the class sample nutrition facts labels for some common foods on Slide 2 – Slide 7 of the “Nutrition” PowerPoint and ask students to try to guess which food each nutrition label represents. *Inform the students that they will play Sorry! Nutrition Edition, at the end of class to review what kinds of foods optimize the energy output we need to function.*

- 1. Introduce the class to the three nutrients that give us energy: carbohydrates, proteins, and fats.**

**Carbohydrates** are easily digested and are the main food group that active young people need to get energy. There are two types of carbohydrates: *simple carbohydrates* and *complex carbohydrates*. Each gram of carbohydrates yields 4 kcal.

Simple carbohydrates are simple and small molecules, such as sugar. Examples of simple carbohydrates-rich foods include candies and sodas. Since simple carbohydrates are small, we digest them easily and they remain in our stomach for only a short time.

Complex carbohydrates are many simple sugar molecules linked together to form larger molecules, such as *starch*. Bread, rice, potatoes, spaghetti, bagels are made up mostly of complex carbohydrates.

Foods containing complex carbohydrates stay in our stomach longer than foods containing simple carbohydrates because it takes longer to digest complex carbohydrates, which must be broken down to simpler sugars first.

**Proteins** give us energy and are also the “building blocks” of all living things. Each gram of proteins yields 4 kcal.

They are molecules that carry out a variety of functions: acting as enzymes that help digest food, building muscles and bones, helping muscles contract, fighting off illnesses, transmitting information between cells, and contributing to body growth, among others. Foods that are rich in proteins include meats such as chicken, fish, beef, and also milk, eggs, and plant foods such as beans and nuts.

**Fats** or lipids give us up to twice as much energy as carbohydrates or proteins. Each gram of fat yields 9 kcal.

Fats are important for our body, because they give us energy, cushion and protect our bones and organs, and help us absorb certain vitamins. Some types of fat are necessary for our body. An example is cholesterol, which is a part of our cell membrane. It is important for us to understand which types of fats and how much we should take in from our foods that would be good for our health.

Foods with fats often taste good. Many of us eat more fat than we need or more than is good for our health. Our body only needs a small amount of fat from our diet; our cells are able to make many of these molecules. One small order of French fries gives us more fat than we need in an entire day! Fats stay in our stomach the longest. This is why if you eat lots of potato chips before dinner, you would not have any appetite for dinner.

*Saturated* fats/lipids are considered unhealthy. They are solid, not liquid, at room temperature. These fats could build up on the wall of our blood vessels to narrow them down or clog them up altogether, leading to heart problems and diseases. Foods rich in such fats include those made with butter, margarine, cream, and many fried foods. On the other hand, some of the *unsaturated* fats are considered healthy, such as those in olive oil, canola oil, fish, and a variety of nuts.

2. **Show the class examples of foods that are rich in carbohydrates, proteins, and fats as you introduce each nutrient. Explain the importance of including all of these nutrients in a healthy diet.**

Suggested examples:

Carbohydrates: pasta, whole grain bread, potatoes, rice

Proteins: fish, meats (beef, ham), poultry (chicken, turkey), soybeans, eggs

Fats: nuts, butter

3. **Show Slide 2 – Slide 7 of “Nutrition” PowerPoint**

Slide 2- Slide 7 of the “Nutrition” PowerPoint contains the nutrition facts labels of different foods that are rich in carbohydrates, proteins, or fats. As you present each nutrition label, ask the students to give their guess as to what the food might be and why. Then reveal the food that matches the nutrition facts label.

4. **Introduce the class to three other important parts of nutrition: vitamins, minerals, and fiber.**

Point out vitamins, minerals and fiber on the example nutrition labels. Draw the three categories (vitamins, minerals, fiber) on the board, and as you go through each one, ask the class to name some foods that correspond with each.

**Teaching Message #2:**

**Although they do not provide energy, water, vitamins and minerals are nutrients we need in order to live a healthy life. Fibers are also important for our health.**

**Water** is necessary for life and makes up 50-60% of our body weight. It is needed for our cells to carry out all sorts of activities. It carries nutrients to all of our cells (blood), cushions our brain, and keeps our body at the right temperature, among others.

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**Vitamins** are organic nutrients that are important in small amounts in helping our cells survive, grow, and function, though they do not yield any energy. Most need to be supplied by our diet. There are different types of vitamins, such as A,B,C,D, and E, each with different functions.

*Vitamin D*, which is produced in our skin when it is exposed to sunlight. It is important because it helps our bodies absorb *calcium* to build strong bones.

As with vitamins, **minerals**, which are chemical elements, are essential for our health

*What are the most important minerals for people your age?*

*Calcium* is important because it helps bones and teeth grow strong. If you do not get enough calcium now, you may have problems later with your bones. Milk is a good source of calcium.

*Iron* is a part of the hemoglobin molecules carried by the red blood cells. They carry oxygen to all parts of our body. Young ladies need extra iron because they lose blood and iron in their menstrual flows. Spinach and beef are rich sources of iron.

*What are fibers and why are they important to our health?*

**Fibers** are the indigestible carbohydrates, which are contained in many plants and fruits. They do not provide us with energy. There are two types of fiber: *soluble fibers* and *insoluble fibers*. Soluble fiber acts as a sponge to bind to some “bad” fats to prevent their absorption into our body. Insoluble fiber helps our bowels move regularly to get rid of bulk wastes.

## **Activity 2 – Animation of Digestion and the Digestive System (12 mins)**

### **Teaching Message #3:**

**The digestive system is where the foods we eat are broken down, nutrients absorbed, and wastes excreted.**

*How do nutrients in food get to the cells in our body that need them most?*

Cells are able to use only small and simple chemicals to make energy, such as glucose. What we eat must be broken down and digested to provide such chemicals. To do this, our body has a Digestive System, one of the organ systems. This is where the foods we eat are broken down, nutrients are absorbed, and wastes are excreted.

For this activity, you will show Slide 9 – Slide 14 of the “Nutrition” PowerPoint. Introduce each organ of the digestive system and explain its function. After the students are familiar with the digestive system, review what they have just learned by showing the video “Digestive System: 101.”

### **1. Show Slide 9 – Slide 14 of the “Nutrition PowerPoint”**

Point out each organ in the gastrointestinal tract in order and explain its function in helping us break down and digest food and/or absorb nutrients.

**Mouth:** Digestion begins in our **mouth**, where food is broken down both mechanically and chemically so that it is easier to swallow. Chewing *mechanically* breaks down the food we eat into smaller pieces. Enzymes in *saliva* begin the initial digestion and *chemical* breakdown of starch in the mouth.

**Esophagus**: After we swallow our food, it travels down our **esophagus**. The esophagus is a soft muscular tube that leads from our mouth to our stomach. Muscles of the esophagus push our food down to the stomach by an action called *peristalsis*.

**Stomach**: The food then enters our **stomach** where much of the digestive process takes place). The stomach can expand like a balloon to accommodate the entry of food. Food is broken down the food further both mechanically and chemically. The muscular walls of the stomach squeeze together to mash the food, breaking it down *mechanically*. *Gastric acid* and enzymes produced by cells in the stomach *chemically* break down all foods further.

**Small Intestines**: The digested food then goes into the **small intestines**. Some digestive process takes place here as well. The resulting simple molecules can now be used to make energy and make energy such as glucose, which is the basic currency to make energy. These molecules move from the small intestines to be bloodstream in a process called *absorption*.

Our small intestine is approximately 20 ft long, which means when stretched out, it is longer than the height of a giraffe! It is twisted and folded to fit inside our body. It is practical to be so long so there is a great deal of area to allow the nutrients to pass efficiently from the small intestines into the bloodstream.

**Large Intestine**: Food that is not completely digested goes into our **large intestines**. This is where water is reabsorbed to be used by our body. The large intestine is about 5 ft long.

The last 6-8 inches of the large intestine is called the **rectum**, which is where the undigested food and roughage that our bodies can't use is stored until it is excreted as feces through the **anus**.

## 2. Show first 4 minutes of “Digestive System: 101” video:

<<http://www.youtube.com/watch?v=1nFwO-9iU5Y>>

### **Activity 3 – Sorry! Nutrition Edition (18 mins)**

For this activity, you will play *Sorry! Nutrition Edition*, to show the students what kinds of foods optimize the energy output we need to function.

1. Divide the class right down the center into two teams
2. Place both Team 1 and Team 2's player magnets at the start.
3. Fairly & uniformly, go around each team one by one (alternating teams each turn) and have each player draw a flashcard and read it. Each flashcard will have the picture of a food.
4. If the student can correctly categorize the food on the card to a nutrient group, either carbohydrate, protein, or fat, his/her team gets to roll a dice and move the number of spaces on the board.

Continue until one team moves ahead 50 spaces and reaches “Finish.” That team wins the game.