Close Reading and Text Dependent Questions in Science
Nutrients: You Just Can't Live Without 'Em (Human Body Systems – Grade 6)

The text selection, *Nutrients: You Just Can't Live Without 'Em,* is found in the *STC Human Body Systems* Student Guide and Source Book pgs. 20-23.

NUTRIENTS:
You Just Can't Live Without 'Em

"Do you want fries with that cheese-burger?"
"Sure, and a large soda, please."
You've ordered a great-tasting lunch, but is it a healthy meal? The good news is that you're getting many of the nutrients you need. The bad news is that you're also about to eat a lot of stuff that you don't need—like extra salt and fat.
When you choose what to eat, you need to think about more than your taste buds. You need to know

An Indian family enjoys dinner.

Foods are part of cultural traditions. All foods, however, contain one or more of the same essential nutrients. Can you tell which of the foods that you see in the first three photographs of this article are high in carbohydrates? Fat? Protein?

Look in the Student Learning Outcome Document for guidance on when this should be taught.
http://bpscurriculumandinstruction.weebly.com/student-learning-outcomes-by-grade.html

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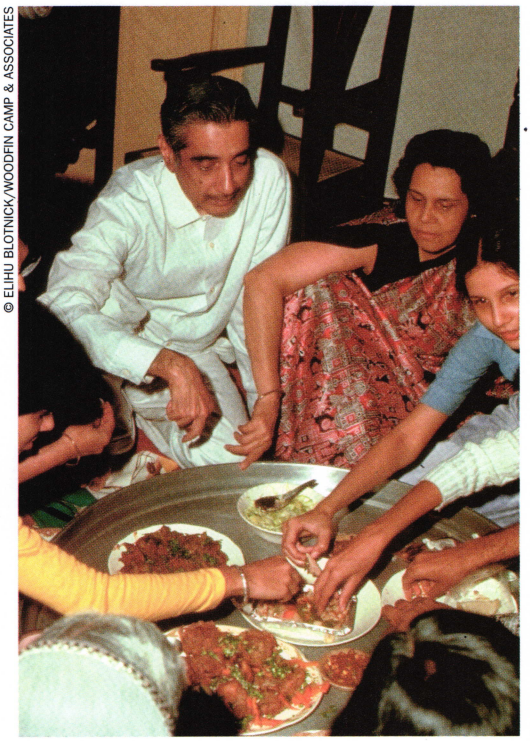

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You've ordered a great-tasting lunch, but is it a healthy meal? The good news is that you're getting many of the nutrients you need. The bad news is that you're also about to eat a lot of stuff that you don't need—like extra salt and fat.

When you choose what to eat, you need to think about more than your taste buds. You need to know what your body needs and what foods will give it to you. You need to know about nutrients.

What are nutrients? They are the fuels your body needs to keep you going. They are used for growth and repair. They help fight disease.

There are six types of nutrients: carbohydrates, proteins, fats, vitamins, minerals, and water. The first three—carbohydrates, proteins, and fats—make up the three basic food types.

Foods are part of cultural traditions. All foods, however, contain one or more of the same essential nutrients. Can you tell which of the foods that you see in the first three photographs of this article are high in carbohydrates? Fat? Protein?

Tortillas, beans, and trimmings are popular foods in Mexico and many other countries.

Rice and vegetables are mainstays of this Asian family's diet.

Carbohydrates: Energy to Burn

The two most important kinds of carbohydrates are sugars and starches. The simplest carbohydrate is a sugar called glucose. Glucose is your body's first choice for fuel.

Complex carbohydrates are called starches. When you eat complex carbohydrates such as pasta, bread, or rice, your body breaks them apart to get the simple sugars that it needs for fast fuel.

But your body doesn't waste the leftovers. It turns most of the extra glucose into a substance called glycogen and saves it in your muscles and liver. If you eat more food than you need at the moment, some of the glucose gets turned into fat. Your body stores fat to make sure it has fuel for its future energy needs. (It's like putting the fat away in a warehouse.)

But watch out: the warehouse can get too full. If you continually eat too much starch or simple sugar—such as the sugar in corn syrup, candy, and soft drinks—you can quickly put on extra pounds. What's more, candy bars and soft drinks usually don't contain other nutrients, like minerals and vitamins that you can get from fruits and vegetables.

Fiber is another carbohydrate. It is made of the same raw materials as sugars: carbon, hydrogen, and oxygen. But you can't digest fiber. So what good is it? Fiber provides bulk that helps move food through your intestines. Fruits provide fiber called pectin. Whole-grain breads and cereals contain cellulose, the fiber that forms a plant's cell walls.

Proteins: The Body Builders

Proteins are at work in every cell of your body. You need proteins to build tissue (muscle tissue contains a lot of protein). Your body also uses proteins to repair damage and to make substances such as hemoglobin, which carries oxygen through your blood.

When your body digests food, it breaks the protein down into simpler substances called amino acids.

These foods are good sources of carbohydrates. Can you name them? Do you know any other foods that are high in carbohydrates?

For many people, meat is an important source of protein. Other protein-rich foods include nuts, egg whites, and cheese.

You might compare amino acids with letters in the alphabet. There are 20 amino acids, and they combine to create millions of different protein "words." Your body also builds some amino acids from scratch by combining carbon, hydrogen, oxygen, and nitrogen.

There are nine amino acids that you can get only from the food you eat. Your body can't build them on its own. These are called the essential amino acids. A food that has all nine essential amino acids is called a complete protein. Food that comes from animals (for example, meat, eggs, and milk) has complete proteins.

Foods that do not have all the essential amino acids are called incomplete proteins. Foods that come from plants—for example, vegetables, fruit, wheat, and rice—contain incomplete proteins.

If you don't want to eat meat or animal products, you can still get your essential amino acids. Just make sure you combine foods that have *different* incomplete proteins. For example, a meal that combines black beans and rice, or lentil soup and corn bread, will give you the complete proteins that you need.

Fats: What's the Skinny?

Too much fat can cause health problems such as obesity and heart disease. But fat isn't all bad news. It has more energy than proteins or carbohydrates. A gram of fat supplies about twice as much energy as a gram of protein or carbohydrates.

What else is good about fat? Thin layers of fat act as protective padding around your heart and other organs. Fat helps insulate your body, too, so you don't have to burn too much fuel to stay warm.

There are two kinds of fats: saturated and unsaturated. Most fats that come from animals are saturated fats. Inside your body, saturated fats can turn into cholesterol—a substance that may collect inside your blood vessels and place an extra burden on your heart. Most fats that come from plants (for example, from nuts and vegetables) are unsaturated fats.

Even though your body can convert carbohydrates into fat, you still need to eat some foods that contain fat. Why? Because your body can't build some of the unsaturated fats that you need.

But be careful. You need only a small amount, and the fatty foods you eat should contain mostly unsaturated, rather than

Eat only small quantities of foods such as these, which are high in fat.

saturated, fat. Meat, cheese, and butter have saturated fat. Sweet baked goods like cookies and cakes also have saturated fat. Fish, avocados, and most liquid cooking oils are sources of unsaturated fats.

Vitamins: The ABCs of Health

Vitamins are chemicals that have been made by living organisms. Scientists discovered the first vitamin (B-1, or thiamin) about 100 years ago. They have now identified a total of 13 vitamins. Each of these vitamins has an essential role in the chemical reactions that go on in our bodies. Vitamins help build blood cells and chemicals that control the nervous system.

You only need tiny amounts of vitamins, but your body can't manufacture them. The best sources of most vitamins are fresh fruits and vegetables.

Minerals: Little Things That Mean a Lot

Minerals are chemicals that occur naturally in the environment. They do not need to be made by a living organism. You need minerals to build bones, teeth, and blood cells. Minerals also regulate the chemical and electrical signals that control the way your body works. Minerals come from the earth. They are absorbed by plant roots as they grow, and they are passed on to animals that eat plants.

You get minerals from many foods—fruits, vegetables, and grains, as well as meat and milk.

You need only tiny amounts of some minerals (for example, copper, iodine, iron, and zinc). These are called trace minerals. You need more of other minerals such as calcium, magnesium, potassium, and sodium. These are the macrominerals.

Calcium, found in milk and cheese, is especially important for children who are still growing. Your body uses calcium to build the hard, strong parts of your body—bones and teeth, for example. Older people need calcium, too, to keep bones strong. Iron is a mineral component of hemoglobin. Because women lose blood during their menstrual cycle, they need more iron than men. Beef, tuna, and chicken are good sources of iron.

Water: Where It All Comes Together

How can water be a nutrient? There's nothing in it! There may not be much nutrition in water, but there's an awful lot of water in you. Your brain and muscles are three-fourths water, and bone is 20 percent water.

Every cell in your body is packed with water. Your body needs it to transport nutrients and wastes, control your temperature, and carry out chemical reactions.

Each day, your body loses more than 2 liters of water. You replace some of it with food, but be sure to drink six to eight glasses of liquid each day to maintain your water supply. When you're thirsty—and even when you're not—have some water.

So What's for Dinner?

The best way to get the nutrients you need is to eat good, fresh food. Get enough of the right stuff, and you won't have to worry about vitamin or mineral pills. Knowing about nutrients can help you choose foods that give your taste buds what they want and the rest of your body what it needs. □

Copper is a trace mineral. You need just a tiny bit of it in your diet. In fact, if this penny were pure copper, it would contain enough of this mineral to meet your daily needs for three and a half years!

Nutrients: You Just Can't Live Without 'Em (Human Body Systems – Grade 6)
Student Questions

1. What are nutrients, and why do we need them?

2. What are the six types of nutrients?

3. The text says, "Glucose is your body's first choice for fuel" (p. 21). What happens if you have left over glucose that your body doesn't immediately need for fuel?

4. What are "essential amino acids" and how can you make sure your body gets them?

5. According to the text, what is one reason why fat is good for your body, and one reason why it is not?

6. Compare and contrast vitamins and minerals.

7. Based upon the reading, describe what foods might be in a healthy, well-balanced meal and explain which foods provide which nutrients.

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Sample Answers

1. **What are nutrients, and why do we need them?**
   Nutrients are the fuels for your body. Nutrients are used for growth, repair, and to help fight disease.

2. **What are the six types of nutrients?**
   The six types of nutrients are: carbohydrates, proteins, fats, vitamins, minerals, and water.

3. **The text says, "Glucose is your body's first choice for fuel" (p. 21). What happens if you have left over glucose that your body doesn't immediately need for fuel?**
   Extra glucose can be changed into glycogen and saved in your muscles and liver. It can also be turned into fat to be stored for future energy needs.

4. **What are "essential amino acids" and how can you make sure your body gets them?**
   The essential amino acids are the nine amino acids that your body can't build alone. You can get them by eating food that comes from animals or by combining different foods with incomplete proteins.

5. **According to the text, what is one reason why fat is good for your body, and one reason why it is not?**
   One reason fat is good is fat can help insulate your body, which helps you save energy when staying warm. One reason fat is bad is saturated fats can turn into cholesterol that collects inside your blood vessels, placing a burden on your heart.

6. **Compare and contrast vitamins and minerals.**
   Vitamins are chemicals made by living organisms, but minerals are not. Minerals come from the Earth. Vitamins help build blood cells and chemicals that control the nervous system. The best place to get vitamins is from fresh fruit and vegetables. Minerals help build bones, teeth, and blood cells. You can get minerals from all sorts of food.

7. **Based upon the reading, describe what foods might be in a healthy, well-balanced meal and explain which foods provide which nutrients.**
   A healthy meal could be composed of chicken and avocado sandwich, a side salad, and a glass of water. The chicken is a complete protein (all essential amino acids), the avocado has unsaturated fats, the bread is a complex carbohydrate, the salad has vitamins and minerals, and the glass of water provides water.