

CLASSES OF NUTRIENTS

OBJECTIVE/RATIONALE

The use of nutrients allows the body to make the energy needed to run physiological processes. The student will identify the six classes of nutrients.

TEKS 121.24 1A, 1C, 6A

TAKS ELA 1, 4
Mathematics 1, 2
Science 4

KEY POINTS

To survive food must be consumed.

Food: Plant and animal products that may be taken into the body to yield nutrients. The nutrients are used for the maintenance of life and the growth and repair of tissues. Through the food we eat we get the nutrients needed to run our bodies physiological processes.

Nutrients: Substances obtained from food and used in the body to provide energy, structural materials, regulate growth, maintenance, and repair of tissues. Nutrients may also reduce the risk of some chronic diseases.

Chemical composition of the nutrients

1. Organic – contain the element carbon
2. Inorganic
3. Chemical elements (minerals):
 - a. Made of atoms that are all alike.
 - b. Never change their identity, their name always stays the same.
4. Compound: a substance made of two or more different atoms. (Some like water are made of only two different atoms. Others like proteins are extremely complex and contain many different atoms.)

I. Six Classes of Nutrients

1. Carbohydrates
2. Proteins
3. Lipids (fats)
4. Vitamins
5. Minerals
6. Water

II. Energy Yielding Nutrients

1. All energy the body needs for metabolic and physiological processes come from nutrients in food we eat.
2. Carbohydrates, lipids and proteins are organic molecules that can be broken down to provide energy.

- a. Metabolism is the process by which nutrients are broken down to yield energy or rearranged into body structures.
 - b. this energy can be converted into mechanical, electrical or heat energy
- 3. Energy is measured in kcalories
 - a. calorie is a unit measure of energy
 - b. one kcalorie is the amount of heat needed to raise the temperature of 1 kilogram of water one degree.
- 4. Energy in food
 - a. 1 gram of carbohydrate = 4 kcalories
 - b. 1 gram of protein = 4 kcalories
 - c. 1 gram of fat = 9 kcalories
 - d. Most foods contain some of all three of the energy containing nutrients in varying degrees.
 - aa. Table sugar only contains one, sucrose.
 - bb. Oil only contains fats.
 - e. Although alcohol contains 7 kcalories in one gram, it is NOT considered a nutrient.
- 5. Energy in the body
 - a. Through metabolism the body breaks the chemical bonds between atoms of nutrients and energy is released.
 - b. Energy can used to build new compounds, move the body or escape as heat.
 - c. If more energy is taken in than needed, the body rearranges the nutrients into carbohydrate and fat storage compounds.

III Vitamins

- 1 13 different vitamins divided into two types, water-soluble and fat-soluble.
- 2. Although vitamins are organic they do NOT give the body energy, they are used as helpers in the extraction of energy. (coenzymes)
- 3. Vital for life and found in food.
- 4. Although too little of a vitamin may cause a deficiency, too much maybe toxic.

IV. Minerals

- 1. Pure inorganic elements, found as either a single atom or in orderly arrays.
- 2. 16 minerals are essential for nutrition
- 3. Are not broken down and changed by the body. They leave the body as they entered it. Ca is still Ca and Fe is still Fe.
- 4. Too much or too little of a mineral may adversely affect a persons health.

V. Water

- 1. Needed for metabolic reactions.
- 2. Supplies the medium for transporting materials to cells and waste products away.

ACTIVITIES

- I. Using the labels from four different varieties of food, categorize the ingredients found in each, according to the six classes of nutrients. Compare and contrast for nutritional quality.

- II. Using the labels from at four brands of the same food, such as soup, categorize the ingredients found in each, according to the six classes of nutrients. Compare and contrast for nutritional quality.

Teacher Note

This can be set up as a station type of activity.

MATERIALS

Food labels from various types of food.

ASSESSMENT

Correct classification of nutrients found in the food.

ACCOMODATIONS

For reinforcement, the student will make a poster depicting the six classes of nutrients.

For enrichment, the student will investigate the harm that is done to the human body when too much of one nutrient is consumed over long periods of time. For example, lipids = obesity.

REFLECTIONS
