



LIFE·PAC®

Health



Alpha Omega Publications®

HIGH SCHOOL HEALTH 2

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Overview

What is physical health? Does physical health pertain only to people who exercise? Maybe you think it describes people who are conscious of eating only healthy food in the correct amounts. In this LIFEPAAC[®], we will learn that nutrition and exercise are essential to attaining and maintaining a healthy body, but clearly are not the only aspects of healthy living.

OBJECTIVES



When you have completed this LIFEPAAC, you should be able to:

- Understand the importance of good nutrition.
- Identify the best sources of specific nutrients and their benefits.
- Differentiate between good eating habits and poor eating habits.
- Understand the importance of exercise to maintaining health.
- Identify the benefits of specific exercises to various components of physical fitness.
- Understand the biblical perspective on diet and exercise.

VOCABULARY



Aerobic – dependent upon oxygen to function.

Anabolism – the process by which the cell uses nutrients to repair or build new tissues.

Anaerobic – not dependent upon oxygen to function.

Atrophy – the decrease in functionality of the body due to lack of use or poor nutrition.

Cardiovascular – relating to the circulatory system.

Calorie – the amount of heat needed to raise the temperature of one kilogram of water one degree Celsius.

Catabolism – the conversion of nutrients into energy.

Enzyme – an organic substance responsible for initiating chemical changes within the body.

Metabolism – the process by which a cell converts nutrients into energy or materials for growth, repair, reproduction, and maintenance.

Nutrients – chemical substances that are absorbed by the body through the process of digestion.

Nutrition – the proper supply of nutrients essential for growth, reproduction, repair, immunity, and energy.

I. NUTRITION AND EXERCISE

Do you think of yourself as physically healthy? If you said yes, is your answer based on the fact that you are involved in physically demanding sports like soccer, football, or hockey? Or, maybe you said yes because you're not overweight. Often, people that are physically active or who appear healthy assume that they are healthy. Your physical health is not only dependent upon the amount of exercise you do per week, but also on the food that you put in your mouth every day. **Nutrition** and exercise are essential to attaining and maintaining a healthy body.

Nutrition

The scientific definition of nutrition “the proper supply of **nutrients** essential for growth, reproduction, repair, immunity, and energy.” However, nutrition can be defined simply as “good eating habits.” Food is composed of nutrients such as carbohydrates, proteins, fats, vitamins, minerals, and water. Nutrients are chemical substances that are absorbed by the body through the process of digestion.

As explained in the first LIFEPAK, food is broken down by complex proteins, called **enzymes**, in the digestive tract. The digestive tract consists of the mouth, pharynx, esophagus, stomach, duodenum, small intestine, and large intestine. In the various organs of the digestive tract, specific enzymes are released to break down specific nutrients. For instance, the enzymes in your saliva that begin the break down of carbohydrates do not affect proteins. Likewise, enzymes in the stomach that contribute to the break down of proteins cannot affect the breakdown of carbohydrates.




Nutrients are broken down in order to prepare them for absorption into the bloodstream. Enzymes chemically alter the makeup of nutrients, changing them into forms that can be readily used by cells throughout the body. Carbohydrates are changed into a sugary substance known as glucose. Proteins are changed into amino acids. Fats are changed into fatty acids such as glycerol. Villi in the lining of the intestines absorb the altered nutrients. Fats, vitamins, and minerals are passed directly into the bloodstream to be absorbed by cells. Glucose and amino acids are transported to the liver, where more enzymes prepare the nutrients for absorption by cells.

Metabolism. After a nutrient is absorbed by a cell, it is metabolized. Metabolism is the process by which a cell converts nutrients into energy or materials. The conversion of nutrients into energy is called **catabolism**. For example, glucose is the cell's main source of energy. When it is combined with oxygen, it produces a chemical reaction that results in the formation of energy for the cell. Any movement of the body requires the metabolism of glucose. When you move your arm or your leg, you are causing a number of cells to undergo the process of catabolism.

Anabolism is the process by which the cell uses nutrients to repair or build new tissues. For example, when a cell is damaged by infection or disease, amino acids and fats are used like building materials to repair cell structures. The maintenance of healthy tissues is dependent upon the presence of amino acids and fats in the body. Vitamins and minerals also play an important part in the facilitation of catabolism and anabolism.

Because the body is made up of many cells, the ability or disability of individual cells to convert nutrients into energy or materials has an effect on the body's overall health. Supplying your cells every day with the right amount of nutrients is the only thing that will enable your body to function properly. For example, eating either a candy bar or a banana with a glass of milk can take away your hunger. The banana and the glass of milk have the right balance of nutrients that your cells need in order to function efficiently. At first, eating a candy bar will make your cells undergo the process of catabolism, converting glucose to energy. You might even feel "hyper" or overly energetic. Your energy, however, will soon fade, making you feel less energetic than you did before you ate the candy bar. Too much of one nutrient and not enough of another will cause your cells to function improperly. As we study the various nutrients, you will discover what foods are best for catabolism and anabolism. In other words, you will realize why eating a banana with a glass of milk is better for you than eating a candy bar.




 **Answer the following questions with short answers.**

I.1 What is the scientific definition of nutrition? _____

I.2 List six nutrients that are found in food. _____

I.3 What are nutrients? _____

I.4 Briefly explain the role of enzymes in digestion. _____

 **Match each definition with the correct word.**

I.5 _____	The process by which a cell converts nutrients into energy or materials.	a. anabolism
I.6 _____	The conversion of nutrients into energy.	b. catabolism
I.7 _____	The cell's main source of energy.	c. metabolism
I.8 _____	The process by which the cells uses nutrients to repair or build new tissues.	d. glucose

Water. The basis of good nutrition is water. Without it, the body cannot survive for more than a couple of days. Eight to ten cups of it must be ingested every day in order to maintain the right level of hydration. This might seem like a lot, but your body is over 60 percent water. Your blood, brain, joints, organs, skin, and even bones depend on water to function properly. The blood is over 80 percent water. Water in the blood enables nutrients, white blood cells, oxygen, carbon dioxide, and hormones to move smoothly through the circulatory system. The brain is nearly 75 percent water. Water in the tissues of the brain enable electrical impulses to travel from one nerve cell to the next. Bones are approximately 20 percent water. The water found in bones facilitates the growth and repair of bone tissue.



Water is essential to all forms of metabolism in the body. Consequently, water loss can cause health problems. The body loses approximately 5–6 pints of water a day through sweat, urine, and exhalation. This must be replenished in order for your body to function properly. Liquids containing caffeine or alcohol should be avoided. Caffeine and alcohol cause the body to urinate, making it dehydrated. Most sodas contain caffeine and should be kept to a minimum. Water from your faucet or a bottle is the best source of fluids. You can also get water by eating foods that have a high water content. Fruits and vegetables are approximately 90 percent water. Eating an apple or an orange is a good way to replenish your body's supply of water.



Answer the following statements true or false.

- I.9 _____ Water is the basis of good nutrition because it is essential to all forms of metabolism in the body.
- I.10 _____ The body can survive 8–10 days without water.
- I.11 _____ The body is less than 20 percent water.
- I.12 _____ The best source of water is soda with caffeine.
- I.13 _____ The body loses approximately 5–6 pints of water a day through sweat, urine, and exhalation.



Carbohydrates. Apples and oranges are good sources of carbohydrates. Carbohydrates are the body's primary and immediate source of energy. Each gram provides the body with 4 calories. A **calorie** is the amount of heat needed to raise the temperature of 1 kilogram of water 1 degree Celsius. Calories are a scientific measurement of fuel. If you were to walk for an hour, for example, you would burn approximately 200 calories. That means various cells in your body would need to convert 50 grams of carbohydrates into glucose to provide the energy needed to walk an hour.

Carbohydrates are “burned” in the form of glucose when oxygen and carbon unite. During digestion, carbohydrates are converted by enzymes into glucose. Glucose is then absorbed by cells and used for energy during metabolism. Unused glucose is sent to muscle cells and fat cells, where it is stored for later use as fuel. In muscle cells, glu-