

Answers from CK-12 Life Science For Middle School Teacher's Edition
<http://www.ck12.org/saythanks>

Day 7

1. Components of the skeletal system include bones, cartilage, and ligaments.
2. Answers may vary. Sample answer: Three functions of the skeletal system include supporting and shaping the body, protecting internal organs, and allowing the body to move.
3. In the fetus, the skeleton starts out consisting entirely of cartilage. The relatively soft cartilage gradually changes to hard bone through ossification. At birth, several areas of cartilage remain, including the ends of the long bones in the arms and legs. This allows these bones to keep growing in length during childhood. By the late teens or early twenties, all of the cartilage has been replaced by bone. Bones cannot grow in length after this point has been reached. However, bones can continue to grow in width. They are stimulated to grow thicker when they are put under stress by muscles.
4. Three types of joints based on the degree of movement they allow are immovable joints, which do not allow the bones to move at all; partly movable joints, which allow very limited movement; and movable joints, which allow the greatest movement. Examples of immovable joints are the joints between the bones of the skull. Examples of partly movable joints are the joints between the bones of the rib cage. Examples of movable joints are the shoulders, elbows, and knees.
5. Weight-bearing exercise causes muscles to put stress on bones. This stimulates the bones to grow wider and stronger. Therefore, weight-bearing exercise might slow down the loss of bone minerals and reduce the risk of developing osteoporosis.
6. Tables may vary, e.g. a sample table might include a comparison of location and function of tissues.
7. Fractures are cracks or breaks in bone. They occur when too much stress is placed on bone. Sprains are strains or tears in ligaments. They occur when ligaments are twisted or stretched too far.

Day 11

1. The body needs food for energy, building materials, and substances that control body processes.
2. A nutrient is any substance that the body needs. Types of nutrients that can provide the body with energy are carbohydrates, proteins, and lipids.
3. Functions of protein in the diet include building muscles, controlling body processes, fighting infections, and carrying substances in the blood.
4. Carbohydrates provide 4 Calories of energy per gram, so the 20 grams of carbohydrates in an apple provide 80 Calories of energy.
5. Macronutrients and micronutrients are two general categories of nutrients. Macronutrients are

nutrients the body needs in relatively large amounts, whereas micronutrients are nutrients the body needs in relatively small amounts. Macronutrients include carbohydrates, proteins, lipids, and water. Except for water, they all provide energy to the body. Micronutrients include minerals and vitamins. They do not provide energy to the body but are needed for other purposes.

6. You need fiber to help keep sugar and lipids at normal levels in the blood. You also need fiber to help keep food waste moist so it can pass easily out of the body.
7. Water is considered a nutrient because it is a substance that the body needs. Cells are mostly water and can't survive without it.

Day 12

1. The GI, or gastrointestinal, tract is a long tube that starts at the mouth and ends at the anus. It includes the mouth, esophagus, stomach, small intestine, and large intestine.
2. In the mouth, the teeth break food into smaller pieces (mechanical digestion) and enzymes in saliva start breaking down starches to sugars (chemical digestion). The only role of the esophagus is to pass food from the mouth to the stomach. In the stomach, the churning of the stomach completes the mechanical digestion of food. Enzymes in the stomach continue chemical digestion. For example, the enzyme pepsin starts breaking down proteins into amino acids.
3. Two functions of the large intestine are eliminating food waste as feces and providing a habitat for helpful bacteria.
4. Answers may vary. Sample answer: Three foods that commonly cause food allergies are milk, shellfish, and nuts.
5. Sample answer: You could reduce the risk of foodborne illness on a picnic by keeping cold foods cold and hot foods hot. This will slow the growth of bacteria in the foods. You could keep cold foods in an ice chest until you are ready to eat them. Hot foods could be kept in a thermos container.
6. Enzymes are proteins that speed up chemical reactions. Digestive enzymes speed up the chemical reactions of digestion. Chemical digestion could not take place without digestive enzymes. Examples may vary. Sample answer: Examples of digestive enzymes are: amylase, which is produced in the mouth and helps digest carbohydrates; and pepsin, which is produced in the stomach and helps digest proteins.
7. Most of the absorption of nutrients takes place in the small intestine. Nutrients are absorbed across the inner surface of the small intestine into blood vessels. Villi are tiny projections that cover the inner surface of the small intestine. They greatly increase the surface area across which absorption can take place. Each villus contains tiny capillaries to absorb the nutrients.