

**TO GO TO ANY OF THE PAGES LISTED BELOW, CLICK ON ITS TITLE**

<b>CHAPTER 14 Digestion and Nutrition</b>	1
<b>14-1</b> What are nutrients? Lesson Review	2
<b>14-2</b> Why are proteins important? Lesson Review	3
<b>14-3</b> Why are vitamins important? Lesson Review	4
Identifying Vitamin Sources Enrichment Activity for Lesson 14-3	5
<b>14-4</b> Why are minerals important? Lesson Review	6
<b>14-5</b> What is a balanced diet? Lesson Review	7
<b>14-6</b> What is the digestive system? Lesson Review	8
<b>14-7</b> What is digestion? Lesson Review	9
Comparing Our Two Sets of Teeth Enrichment Activity for Lesson 14-7	10
<b>14-8</b> What happens to food in the stomach? Lesson Review	11
<b>14-9</b> What happens to food in the small intestine? Lesson Review	12
Enzyme Action Enrichment Activity for Lesson 14-9	13
<b>THE BIG IDEA</b> Integrating Chemistry: What chemical reactions take place during digestion? Lesson Review	14
<b>14-10</b> How do living things get energy? Lesson Review	15
Chapter 14 Key Term Review	16
Chapter 14 Test	17
Chapter 14 Answer Key	20

# 14-1 What are nutrients?

## Lesson Review

Match each term in **Column B** with its description in **Column A**. Write the correct letter in the space provided.

Column A	Column B
_____ 1. starches	a. nutrients
_____ 2. liquid fats	b. protein
_____ 3. nutrient needed to build and repair cells	c. simple carbohydrates
_____ 4. chemical substances in food that are needed by the body for growth, energy, and the life processes	d. complex carbohydrates
_____ 5. energy-storage nutrients	e. fats
_____ 6. sugars	f. oils

## Skill Challenge

**Skills:** synthesizing, researching, organizing

Complete the table below by writing the missing information under each heading. Use your text and other reference materials for help if necessary.

NUTRIENTS			
Nutrient	Example	Used by the Body for	Food Sources
1. Simple carbohydrate	a.	b.	fruits, juices
2. Complex carbohydrate	a.	b.	c.
3. a.	butter	b.	animal products
4. Liquid fats	a.	energy, insulation	b.
5. a.	meat	build and repair tissues	b.

## 14-2 Why are proteins important?

### Lesson Review

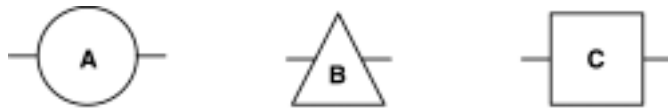
Complete the following.

1. What is a molecule? \_\_\_\_\_  
\_\_\_\_\_
2. List four elements that all proteins contain. \_\_\_\_\_  
\_\_\_\_\_
3. List four ways that the body uses proteins. \_\_\_\_\_  
\_\_\_\_\_
4. What are amino acids? \_\_\_\_\_  
\_\_\_\_\_
5. Why are amino acids called the building blocks of proteins? \_\_\_\_\_  
\_\_\_\_\_
6. How many amino acids are needed by the human body? \_\_\_\_\_

### Skill Challenge

**Skills:** relating concepts, interpreting diagrams, applying definitions

Symbols can be used to represent each type of amino acid. The body can sequence these amino acids in many different ways. Study the symbols for the amino acids shown. In the space provided, draw three different ways in which these symbols could be sequenced to form proteins by attaching the symbols together in a line. Then, answer the question.



The word *synthesis* means “a combination of parts into a whole.” Why do you think the process by which amino acids form proteins is called protein synthesis? \_\_\_\_\_

\_\_\_\_\_

# 14-3 Why are vitamins important?

## Lesson Review

**PART A** Complete the following.

1. What is a vitamin? \_\_\_\_\_
2. What is a deficiency disease? \_\_\_\_\_
3. What vitamins are made by the body? \_\_\_\_\_
4. What effect does rickets have on the body? \_\_\_\_\_
5. What are some ways the body uses vitamins? \_\_\_\_\_

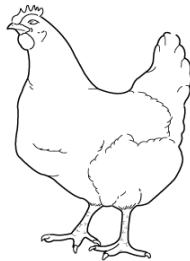
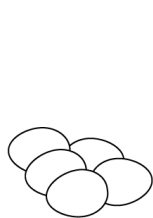
**PART B** Match each vitamin to the deficiency disease it is most closely associated with. Write the correct letter in the space provided.

Deficiency Disease	Vitamin
_____ 1. night blindness	a. vitamin D
_____ 2. beriberi	b. vitamin C
_____ 3. scurvy	c. vitamin A
_____ 4. skin disorders	d. vitamin B <sub>3</sub>
_____ 5. rickets	e. vitamin B <sub>1</sub>
_____ 6. pellagra	f. vitamin B <sub>2</sub>

## Skill Challenge

**Skills:** identifying, relating concepts

Refer to Figure 14-7 on page 332 in your text to identify the vitamins that are supplied by each food shown below. *Note:* Some foods are sources of more than one vitamin. Write your answer in the space provided below each diagram.



1. \_\_\_\_\_  
\_\_\_\_\_
2. \_\_\_\_\_  
\_\_\_\_\_
3. \_\_\_\_\_  
\_\_\_\_\_
4. \_\_\_\_\_  
\_\_\_\_\_

# Identifying Vitamin Sources

## Enrichment Activity for Lesson 14-3

**Skills:** *identifying, relating*

**PART A** Many food products list the vitamins they contain on the side of their packages. Find food packaging labels that list the following vitamins. Then, list the health benefits of each vitamin.

1. Vitamin A \_\_\_\_\_  
\_\_\_\_\_
2. Vitamin B<sub>1</sub> (thiamin) \_\_\_\_\_  
\_\_\_\_\_
3. Vitamin B<sub>2</sub> (riboflavin) \_\_\_\_\_  
\_\_\_\_\_
4. Vitamin B<sub>3</sub> (niacin) \_\_\_\_\_  
\_\_\_\_\_
5. Vitamin C \_\_\_\_\_  
\_\_\_\_\_
6. Vitamin D \_\_\_\_\_  
\_\_\_\_\_

**PART B** The nutritional listing on food packaging shows how much of the RDA, or Recommended Dietary Allowances, for each nutrient listed that the food contains. For each food source that you found in Part A, determine how many servings of that food you would have to eat to get the RDA for each nutrient that it lists on the label. Use that information to complete the table below.

VITAMIN SOURCES	
Food	Vitamins/how many servings you would need to get the RDA
1.	
2.	
3.	
4.	
5.	

6. Do you think taking a daily multi-vitamin is a good idea? Why or why not? \_\_\_\_\_  
\_\_\_\_\_

# 14-4 Why are minerals important?

## Lesson Summary

Complete the following.

1. What is a mineral? \_\_\_\_\_  
\_\_\_\_\_
2. What mineral is needed by the body in order to form red blood cells? \_\_\_\_\_
3. Why does the body need calcium and phosphorus? \_\_\_\_\_  
\_\_\_\_\_
4. What kind of disease is caused by a mineral missing from the diet? \_\_\_\_\_  
\_\_\_\_\_
5. What deficiency disease is caused by a diet that contains too little iron? \_\_\_\_\_
6. What deficiency disease is caused by a diet that lacks iodine? \_\_\_\_\_
7. Why does the body need sodium? \_\_\_\_\_  
\_\_\_\_\_
8. What is another name for anemia? \_\_\_\_\_

## Skill Challenge

**Skills:** *identifying, organizing*

Complete the table below. You may list more than one mineral name in the right-hand column.

HOW THE BODY USES MINERALS	
Use	Minerals
1. Builds strong bones and teeth	
2. Helps keep muscles and nerves healthy	
3. Helps in the formation of body cells	
4. Helps make hydrochloric acid for digestion	
5. Makes chemicals that control oxidation	
6. Helps in the formation of enzymes	

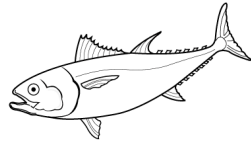
# 14-5 What is a balanced diet?

## Lesson Review

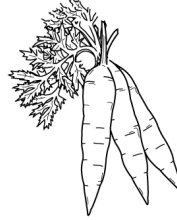
**PART A** Identify the food group in which each food belongs. Write the name of the correct food group in the space provided.



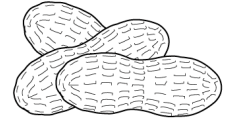
1. \_\_\_\_\_



2. \_\_\_\_\_



3. \_\_\_\_\_



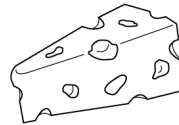
4. \_\_\_\_\_



5. \_\_\_\_\_



6. \_\_\_\_\_



7. \_\_\_\_\_



8. \_\_\_\_\_

**PART B** Complete the following.

- What is malnutrition? \_\_\_\_\_  
\_\_\_\_\_
- What is a balanced diet? \_\_\_\_\_  
\_\_\_\_\_
- List the names of the six food groups. \_\_\_\_\_  
\_\_\_\_\_
- What are food labels and how do you read them? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Skill Challenge

**Skills:** *classifying, applying concepts*

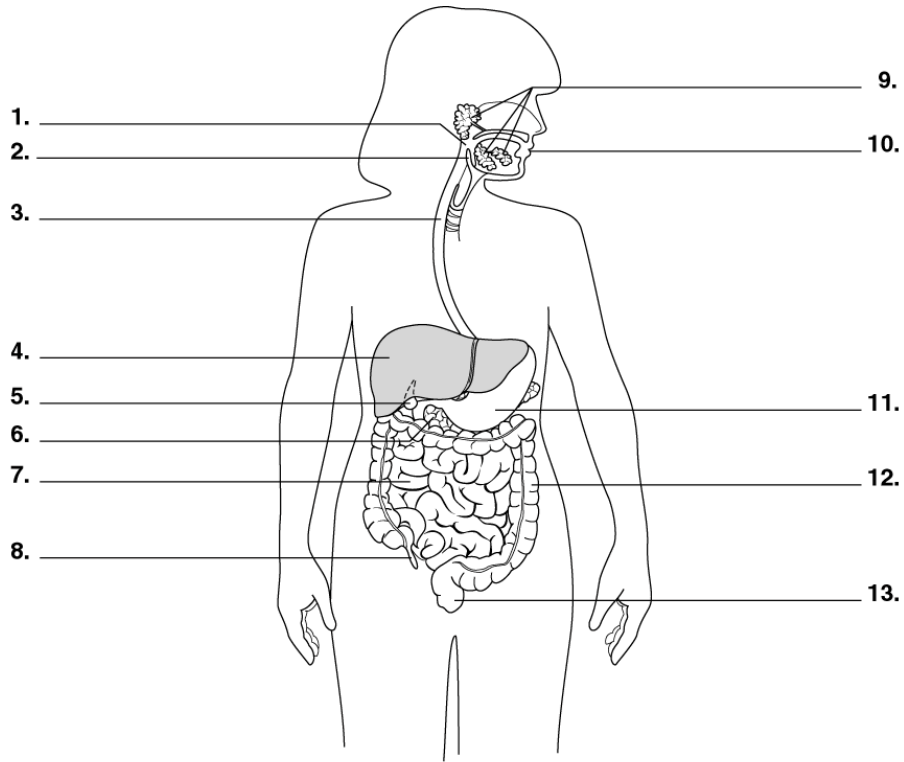
Write the names of the six food groups on a sheet of paper. Place each food listed in the box below into its correct food group by writing its name beneath the proper heading.

FOOD LIST						
tuna fish	peas	walnuts	yogurt	rice	lettuce	pear
Swiss cheese	banana	spaghetti	chicken	broccoli	milk	apple

# 14-6 What is the digestive system?

## Lesson Review

Label the parts of the digestive system. Then, answer the questions that follow.



14. What is digestion? \_\_\_\_\_

\_\_\_\_\_

15. What is peristalsis? \_\_\_\_\_

\_\_\_\_\_

### Skill Challenge

**Skill:** relating concepts

The liver, gall bladder, and stomach are not part of the digestive tract. However, each of these organs aids digestion in a different way. Complete the chart showing how each of these organs aids digestion.

Organ	How the Organ Helps Digestion
Stomach	
Liver	
Gall bladder	

# 14-7 What is digestion?

## Lesson Review

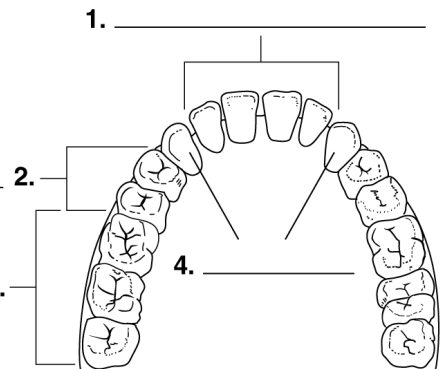
Complete the following.

1. By what process are large food molecules broken down into smaller food molecules?  
\_\_\_\_\_
2. By what process are large pieces of food broken down into smaller pieces of food?  
\_\_\_\_\_
3. By what process is food changed into usable forms? \_\_\_\_\_
4. What are enzymes? \_\_\_\_\_
5. How is food broken down mechanically in the mouth? \_\_\_\_\_
6. What is saliva? \_\_\_\_\_
7. What substance does the enzyme in saliva change starch into? \_\_\_\_\_
8. How does mechanical digestion change the surface area of food? \_\_\_\_\_

## Skill Challenge

**Skills:** identifying, relating concepts

Label the kinds of teeth shown in the diagram on the right. Then, answer the questions that follow.



5. How many teeth does an adult have?  
\_\_\_\_\_
6. What is the function of canines and incisors? \_\_\_\_\_
7. What role does the tongue play when food is being chewed? \_\_\_\_\_
8. What are the functions of bicuspids and molars? \_\_\_\_\_
9. What is enamel? \_\_\_\_\_

# Comparing Our Two Sets of Teeth

## Enrichment Activity for Lesson 14-7

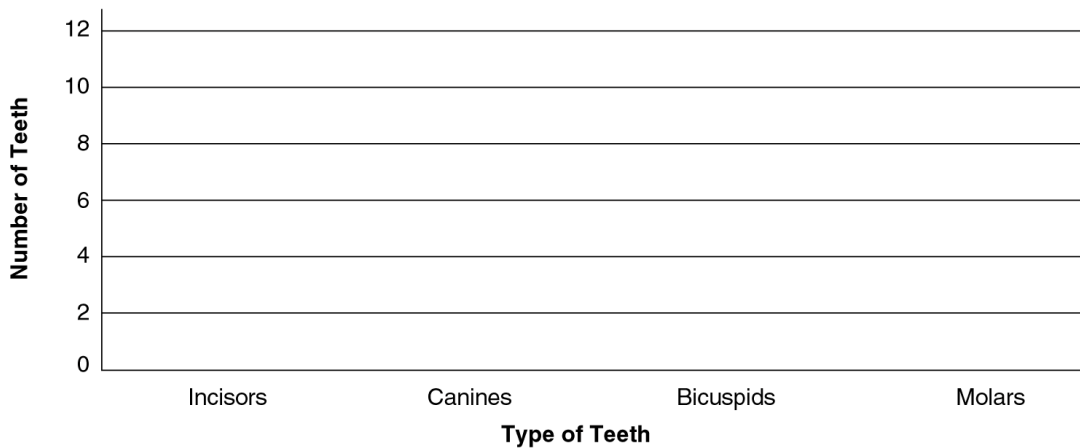
**Skills:** graphing, comparing

The table below shows the number and kinds of teeth that make up both sets of teeth. In the space provided, create a bar graph, using two different colors, that compares the two sets of teeth. Then, use your graph to answer the questions that follow.

Humans have two sets of teeth during their lifetimes. The first set, called deciduous teeth or baby teeth, form before birth. This set of 20 teeth appears at about 6 months of age. They continue to grow until about age 2. Around age 6, deciduous teeth begin to fall out. They are replaced with permanent teeth. This set of 28 teeth continues to develop until about age 21.

TEETH		
Type of Teeth	Deciduous Teeth	Permanent Teeth
Incisors	8	8
Canines	4	4
Bicuspid	0	8
Molars	8	12

Two Sets of Teeth



1. What is the difference in the number of deciduous and permanent teeth? \_\_\_\_\_  
\_\_\_\_\_
2. What teeth are found in a set of permanent teeth but not in a set of deciduous teeth?  
\_\_\_\_\_
3. How can a mouth hold 28 teeth at age 25 but only 20 teeth at age 3? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## 14-8 What happens to food in the stomach?

### Lesson Review

Complete the following.

1. What kinds of digestion take place in the stomach? \_\_\_\_\_
2. What is the name of the liquid produced by the stomach? \_\_\_\_\_
3. What three substances make up gastric juice? \_\_\_\_\_
4. What is pepsin? \_\_\_\_\_  
\_\_\_\_\_
5. What substance does pepsin help to digest? \_\_\_\_\_
6. What does mucus do? \_\_\_\_\_  
\_\_\_\_\_
7. How does hydrochloric acid help to digest food? \_\_\_\_\_  
\_\_\_\_\_
8. In what form does food leave the stomach? \_\_\_\_\_
9. Where does the liquid that leaves the stomach go? \_\_\_\_\_

### Skill Challenge

**Skills:** *researching, applying definitions, classifying*

Use a dictionary to define the three terms below. Write the definitions in the spaces provided. Then, use the definitions to answer the question that follows.

1. **acid:** \_\_\_\_\_  
\_\_\_\_\_
2. **pH scale:** \_\_\_\_\_  
\_\_\_\_\_
3. **base:** \_\_\_\_\_  
\_\_\_\_\_
4. Acids have a pH less than 7. Bases have a pH greater than 7. Which of the substances listed in the table below are acids? \_\_\_\_\_  
\_\_\_\_\_

vinegar (pH = 3)	pure water (pH = 7)	ammonia (pH = 12)	soap (pH = 10)
Orange juice (pH = 3.3)	milk (pH = 6.4)	blood (pH = 7.2)	Tomato juice (pH = 4)

# 14-9 What happens to food in the small intestine?

## Lesson Review

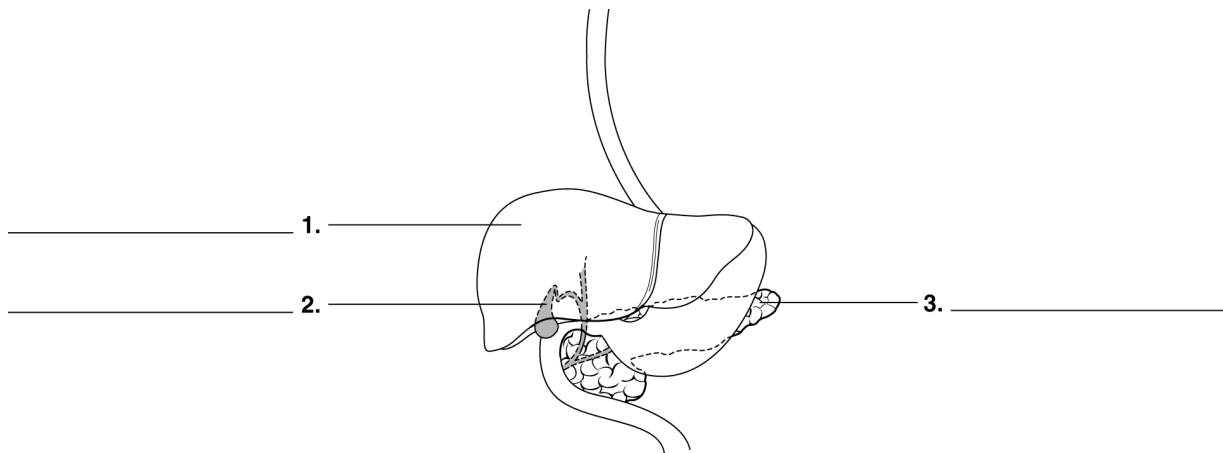
Match each term in **Column B** with its description in **Column A**. Write the letter of the correct term in the space provided.

Column A	Column B
_____ 1. process of breaking down large droplets of fat into smaller droplets	a. bile
_____ 2. organ in which most chemical digestion is completed	b. lipase
_____ 3. enzyme that digests fats and oils	c. small intestine
_____ 4. sac that stores bile	d. liver
_____ 5. largest organ inside the human body	e. gall bladder
_____ 6. green liquid that breaks down fats and oils	f. emulsification
_____ 7. fingerlike projections on the lining of the small intestine	g. absorption
_____ 8. movement of food molecules from digestive system to the blood	h. villi
_____ 9. organ that absorbs some minerals and water after leaving the small intestine	i. large intestine

## Skill Challenge

**Skill:** organizing

Label the *liver*, *gall bladder*, and *pancreas* in the spaces provided.



# Enzyme Action

## Enrichment Activity for Lesson 14-9

**Skill:** researching

**PART A** Listed below are enzymes that help the body digest food. Use your text and other reference materials to identify the kind of food each enzyme breaks down. In the last column, identify the organ that produces each enzyme.

DIGESTIVE ENZYMES		
Enzyme	Type of Food It Breaks Down	Place Where Enzyme Is Produced or Stored
Trypsin		
Sucrose		
Lipase		
Amylopsin		
Pepsin		
Amylase		
Lactase		
Gastrin		

**PART B** Certain kinds of diseases are caused by a lack of particular enzymes. Listed below are two such diseases. Use reference materials to describe the cause and symptoms of each disease.

**1. Krabbe's disease**

cause: \_\_\_\_\_

\_\_\_\_\_

symptoms: \_\_\_\_\_

\_\_\_\_\_

**2. phenylketonuria (PKU)**

cause: \_\_\_\_\_

\_\_\_\_\_

symptoms: \_\_\_\_\_

\_\_\_\_\_

THE **Big** IDEA

*Integrating Chemistry*

## Chapter 14 What chemical reactions take place during digestion?

### Lesson Review

Refer to the article, call outs, and Figure 14-24 on pages 348 and 349 of your text to answer the following questions.

1. What chemical neutralizes chyme? \_\_\_\_\_  
\_\_\_\_\_
2. What is the role of pepsin? \_\_\_\_\_  
\_\_\_\_\_
3. What chemicals help in the digestion of fats? \_\_\_\_\_  
\_\_\_\_\_

### Skill Challenge

**Skills:** *inferring, analyzing*

Complete the following.

1. Why do you think people with some digestive problems take antacids? \_\_\_\_\_  
\_\_\_\_\_
2. Suppose that you just ate a baked potato with butter. Would chemical digestion begin earlier on the potato or the butter? Explain. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
3. What would happen if the liver did not secrete bile? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### Science Log Writing Activity

Complete the Science Log on a separate sheet of paper. To complete the Big Idea Online, go to [www.conceptsandchallenges.com](http://www.conceptsandchallenges.com). Follow the online instructions.

# 14-10 How do living things get energy?

## Lesson Review

**PART A** Complete the following.

1. What is a Calorie? \_\_\_\_\_
2. How do living things get energy? \_\_\_\_\_
3. What are two byproducts of cellular respiration? \_\_\_\_\_
4. Which nutrient gives off the most energy? \_\_\_\_\_
5. How much energy do carbohydrates and proteins contain? \_\_\_\_\_
6. How much energy does the body get from fat? \_\_\_\_\_
7. How does your body use energy? \_\_\_\_\_

**PART B** Use the information in your text to calculate the number of Calories supplied by each of the following. Write your answers in the spaces provided.

- |                                   |   |
|-----------------------------------|---|
| _____ 1. 10 grams of starch       | _____ 5. 15 grams of fat                  |
| _____ 2. 4 grams of carbohydrates | _____ 6. 9 grams of starch                |
| _____ 3. 3 grams of protein       | _____ 7. 4 g of fat + 3 g of protein      |
| _____ 4. 6 grams of fat           | _____ 8. 10 g of protein + 10 g of starch |

## Skill Challenge

**Skills:** analyzing, inferring, relating concepts

The chemical and word equations for the process of cellular respiration are shown below. Use the formula to answer the questions that follow.



1. What are the byproducts of cellular respiration? \_\_\_\_\_
2. What sugar is used for cellular respiration? \_\_\_\_\_
3. Why does the body carry out cellular respiration? \_\_\_\_\_
4. What substances does the body need to carry out cellular respiration? \_\_\_\_\_