**Chapter Project Worksheet 2**

1. Answers will vary. Look for completeness. Check also that foods are classified in more than one food group when necessary.

2. Answers will vary. Check that graphs are properly labeled. The easiest way to compare the food log results with recommended diet is to have the two graphs for each food group on the same grid.

3. Answers will vary. If what students actually ate was far from the ideal diet, students should pick one aspect of diet to change, rather than try to change to an ideal diet for three days. This increases the likelihood of success.

4. Answers will vary. Students should keep another three-day food log, also spanning two weekdays and one weekend day.

5. Answers will vary. Answers should reflect students actual experiences in this project.

**Food and Energy**

**Guided Reading and Study**

*Use Target Reading Skills*

I. Why You Need Food

A. Nutrients

B. Energy

C. Nutritionists’ Recommendations

II. Carbohydrates

A. Simple Carbohydrates

B. Complex Carbohydrates

C. Nutritionists’ Recommendations

III. Fats

A. Kinds of Fats

B. Cholesterol

C. Nutritionists’ Recommendations

IV. Proteins

A. Amino Acids

B. Complete and Incomplete Proteins

V. Vitamins and Minerals

A. Fat-Soluble and Water-Soluble Vitamins

B. Importance of Vitamins

C. Importance of Minerals

VI. Water

1. a. The materials for growing and for repairing tissues; b. The energy for everything you do

2. true

3. nutrients

4. a. carbohydrates

b. fats

c. proteins

d. vitamins

e. minerals

f. water

5. calories

6. true

7. energy

8. false

9. b

10. a

11. b

12. a

13. Fats are high-energy nutrients that are made up of carbon, oxygen, and hydrogen.

14. b

15. a. Form part of the structure of cells

b. Protect and support internal organs

c. Insulate the body to keep in heat

16. Unsaturated Fats: Liquid; Most oils, such as olive and canola oils

Saturated Fats: Solid; Meat and dairy products

17. proteins

18. a. Needed for tissue growth and repair

b. Play a part in chemical reactions in cells

c. Can serve as a source of energy

19. d

20. false

21. b

22. a

23. a

24. b

25. Vitamins are helper molecules in a variety of chemical reactions within the body.

26. b, c, d

27. minerals

28. Your body gets minerals by eating plant foods or animals that have eaten plants.

29. c

30. d

31. a

32. b

33. water

34. The body’s vital processes—including chemical reactions such as the breakdown of nutrients—take place in water.

**Food and Energy**

**Review and Reinforce**

1. Carbohydrates

2. Fats

3. Vitamins or minerals

4. Vitamins or minerals

5. Water

6. Complex

7. Sugars

8. Unsaturated

9. Saturated
10. Amino acids
11. It is needed for all body processes.
12. Nutrients provide the raw materials and energy necessary for the body to carry out all essential processes.
13. A calorie is the amount of energy needed to raise the temperature of 1 gram of water by one Celsius degree. A Calorie is 1,000 calories. The Calorie is used to measure the energy content of food.
14. Cholesterol
15. vitamin
16. Fiber
17. glucose
18. protein
19. mineral

Food and Energy

Enrich
1. Low-fat
2. High-protein
3. Fat-free, sugar-free, and low-sodium
4. Sample answer: A diet low in saturated fat has been linked to a reduced risk of some cancers. A diet low in sodium has been linked to a reduced risk of high blood pressure.
5. Most students will say that FDA nutrient and health claims on food packaging are a good idea, because they allow people to make informed decisions about what they eat.

Consumer Lab
Raisin’ the Raisin Question
For answers, see the Teacher’s Edition.

Healthy Eating
Guided Reading and Study
Use Target Reading Skills
Sample questions and answers:
Q: What is the Food Guide Pyramid?
A: The Food Guide Pyramid classifies food into groups to help people plan a healthy diet.
Q: What kind of information can I find on a food label?
A: serving size, Calories, Percent Daily Value, and ingredients

Healthy Eating

Answer Key

1. The Food Guide Pyramid classifies foods into six groups. It also tells how many foods to eat from each group every day.
2. The foods in the bottom level of the pyramid—foods from grains, such as bread, cereals, rice, and pasta—should make up the largest part of the diet.
3. sparingly
4. true
5. serving size
6. A single serving of this food supplies the body with 110 Calories of energy.
7. The Percent Daily Value shows how the nutritional content of one serving fits into the diet of a person who needs 2,000 Calories each day.
8. false
9. weight
10. It can alert you to substances that have been added to the food that could make you sick.

Healthy Eating
Review and Reinforce

1. Fats, Oils, and Sweets
2–3. Milk, Yogurt, and Cheese Group; Meat, Poultry, Fish, Dry Beans, Eggs, and Nuts Group
4–5. Vegetable Group; Fruit Group
6. Bread, Cereal, Rice, and Pasta Group
7. The larger the group, the more servings you should eat of these food.
8. Fats, oils, and sweets
9. Multiply the number of Calories listed by two.
10. The percentage of Calories from fat is 14.28%.
11. The Food Guide Pyramid is used to healthy diets by suggesting the amounts of each type of food to eat.
12. A Percent Daily Value indicates how the nutritional content of one serving fits into the diet of a person who consumes a total of 2,000 Calories a day.

Healthy Eating

Enrich

1. The cookies are a low-fat food.
2. The peanut butter is a high-protein food.
3. The soda is a low-fat, fat-free, sugar-free, and low-sodium food.
4. Because the soda is fat free, you could label it with the health claim linking a diet high in fat to a greater risk of cancer. Because the soda is low sodium, you could label it with the health claim linking a diet high in sodium to a greater risk of high blood pressure.

5. Answers may vary. Sample: Yes, I think it’s a good idea. If the FDA didn’t control nutrient claims, each food company might define these terms in a different way. Also, some food companies might use health claims that haven’t been tested just so they could sell more food. Because the FDA controls nutrient and health claims, you can know exactly what the claims mean and that they are true.

The Digestive Process Begins
Guided Reading and Study

Use Target Reading Skills
Sample Answer:
What You Know
1. Food is digested in the stomach.
2. The digestive system breaks down food.
3. Teeth break foods into small pieces.

What You Learned
1. Teeth carry out mechanical digestion.
2. An enzyme in saliva breaks down starches into sugars.
3. Muscle contractions called peristalsis push food toward the stomach.
4. Food; blood; wastes
5. Digestion is the process by which the body breaks down food into small nutrient molecules.
6. False
7. b
8. An enzyme in saliva breaks down starch into sugar molecules.
9. b
10. c
11. a
12. d
13. a, c, d
14. a. Mucus coats and protects the stomach lining. b. Cells in the stomach lining are quickly replaced.

The Digestive Process Begins
Review and Reinforce

1. Break down food
2. Absorb food molecules into blood
3. Eliminate wastes
4. Esophagus
5. Stomach
6. In mechanical digestion, food is physically broken down into smaller pieces. In chemical digestion, chemicals made by the body break foods into their smaller chemical building blocks.
7. epiglottis
8. Mucus
9. absorption
10. peristalsis
11. stomach
12. esophagus
13. saliva
14. digestion
15. enzyme

The Digestive Process Begins
Enrich

1. If the stomach were less acidic, digestive juice would be less likely to damage the lining of the stomach.
2. The mucus layer is less acidic than the digestive juice.
3. People who received the vaccine would be much less likely to develop stomach ulcers. Therefore, the number of people with stomach ulcers would decrease.
4. H. pylori would probably not be able to survive without urea. They break down this chemical to reduce the acidity of their environment.

Skills Lab
As the Stomach Churns

For answers, see the Teacher’s Edition.
Final Digestion and Absorption
Guided Reading and Study

Use Target Reading Skills
Main Idea: Chemical digestion takes place in the small intestine.
Details: Food mixes with enzymes and secretions; starches, proteins, and fats are digested chemically. Enzymes and secretions are produced by the small intestine, liver, and pancreas.

1. Almost all chemical digestion and absorption of nutrients takes place in the small intestine.
2. a. small intestine; b. liver; c. pancreas
3. liver
4. bile
5. The gallbladder stores the bile produced by the liver and delivers it to the small intestine.
6. starches, proteins, fats
7. villi
8. true
9. true
10. Absorb water into the bloodstream; Prepare undigested food for elimination
11. rectum
12. b

Final Digestion and Absorption
Review and Reinforce

<table>
<thead>
<tr>
<th>Small Intestine</th>
<th>Large Intestine</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>✓</td>
</tr>
<tr>
<td>2.</td>
<td>✓</td>
</tr>
<tr>
<td>3.</td>
<td>✓</td>
</tr>
<tr>
<td>4.</td>
<td>✓</td>
</tr>
<tr>
<td>5.</td>
<td>✓</td>
</tr>
<tr>
<td>6.</td>
<td>✓</td>
</tr>
<tr>
<td>7.</td>
<td>✓</td>
</tr>
<tr>
<td>8.</td>
<td>✓</td>
</tr>
</tbody>
</table>

9. The water is absorbed into the bloodstream.
10. Bile is a substance produced by the liver that breaks up fat particles.
11. d
12. a
13. f
14. e
15. c
16. g
17. b

Final Digestion and Absorption
Enrich

1. It is more serious in babies because milk is usually one of their main sources of nutrients.
2. The swelling of the large intestine is caused by the gases produced by bacteria as they feed on lactose, and by large amounts of water that enter the large intestine because of the high lactose concentration in the large intestine.
3. Lactose-reduced milk is made by adding the enzyme lactase to regular milk. The lactase breaks down the lactose in the milk.
4. Answers may vary. Sample: Her body probably doesn’t produce lactase. One glass of milk might not contain enough lactose to have a bad effect, but two glasses is enough for the symptoms to occur. Alternatively, her body may produce a small amount of lactase that is capable of digesting the lactose in one glass of milk, but not two.

Key Terms
1. pancreas
2. mucus
3. vitamin
4. absorption
5. Food Guide Pyramid
6. gallbladder
7. enzyme
8. saturated fat
9. Key Term: nutrient

Definition: A nutrient is a substance in food that provides the raw materials and energy the body needs to carry out all its essential processes.
Connecting Concepts
This concept map is only one way to represent the main ideas and relationships in this chapter. Accept other logical answers from students.
Laboratory Investigation

Nutrient Identification

Pre-Lab Discussion
1. Simple carbohydrates are called sugars, and complex carbohydrates are called starches.
2. Proteins repair cells and permit cell growth in the body. They also provide energy.

Procedure
Part A
4. Predictions will depend on foods chosen. Predictions may be based on experiences where foods have been described as starchy.
Part B
7. Predictions will depend on foods chosen. Predictions may be based on experiences where foods have tasted sweet.
Part C
4. Predictions will depend on foods chosen. Predictions may be based on personal experience with reading food labels.

Observations

Data Table 1

<table>
<thead>
<tr>
<th>Food Tested</th>
<th>Color with Iodine Solution</th>
<th>Is Starch Present?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flour</td>
<td>Purplish-black or blue-black</td>
<td>Yes</td>
</tr>
<tr>
<td>Diet clear soda</td>
<td>Yellow-brown</td>
<td>No</td>
</tr>
<tr>
<td>Regular clear soda</td>
<td>Yellow-brown</td>
<td>No</td>
</tr>
<tr>
<td>Milk</td>
<td>Yellow-brown</td>
<td>No</td>
</tr>
<tr>
<td>Apple</td>
<td>Yellow-brown</td>
<td>No</td>
</tr>
<tr>
<td>Bread</td>
<td>Purplish-black or blue-black</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Data Table 2

<table>
<thead>
<tr>
<th>Food Tested</th>
<th>Color with Benedict’s Solution</th>
<th>Is Simple Sugar Present?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Honey and water</td>
<td>Green, yellow, orange, or orange-red</td>
<td>Yes</td>
</tr>
<tr>
<td>Diet clear soda</td>
<td>Blue</td>
<td>No</td>
</tr>
<tr>
<td>Regular clear soda</td>
<td>Green, yellow, orange, or orange-red</td>
<td>Yes</td>
</tr>
<tr>
<td>Milk</td>
<td>Blue</td>
<td>No</td>
</tr>
<tr>
<td>Apple</td>
<td>Green, yellow, orange, or orange-red</td>
<td>Yes</td>
</tr>
<tr>
<td>Bread</td>
<td>Green, yellow, orange, or orange-red</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Data Table 3

<table>
<thead>
<tr>
<th>Food Tested</th>
<th>Color with Biuret Solution</th>
<th>Is Protein Present?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gelatin solution</td>
<td>Violet</td>
<td>Yes</td>
</tr>
<tr>
<td>Diet clear soda</td>
<td>No color change</td>
<td>No</td>
</tr>
<tr>
<td>Regular clear soda</td>
<td>No color change</td>
<td>No</td>
</tr>
<tr>
<td>Milk</td>
<td>Violet</td>
<td>Yes</td>
</tr>
<tr>
<td>Apple</td>
<td>No color change</td>
<td>No</td>
</tr>
<tr>
<td>Bread</td>
<td>Violet</td>
<td>Yes</td>
</tr>
</tbody>
</table>
**Analyse and Conclude**

1. Answers will vary. For the sample data, flour and bread contain starches. Food containing starch turns iodine blue-black.
2. Answers will vary. For the sample data, honey, regular soda, apples, and bread contain simple sugars. Foods containing simple sugars will turn Benedict’s solution green, yellow, orange, or orange-red.
3. Answers will vary. For the sample data, gelatin, milk, and bread contain protein. Foods containing protein will turn Biuret solution violet.

**Critical Thinking and Applications**

1. No, Biuret solution is used to test for proteins only. It does not indicate whether fats, starches, or sugars are present. The tests for these nutrients must be done individually.
2. By eating foods that contain different nutrients, you will maintain a balanced diet and get all the nutrients necessary for good health.
3. Answers will vary. Sample questions: Does a food contain saturated or unsaturated fats? Are there tests to detect certain vitamins and minerals?
4. Answers will vary. Sample answer: Find out what chemicals test for saturated fats, unsaturated fats, certain vitamins, and minerals.

**More to Explore**

Amounts will vary. The content of vitamin C is influenced by the following factors: whether vitamin C has been added; whether water has been added; and whether the juice is fresh, frozen, or canned.

**Performance Assessment**

**Analyse and Conclude**

1. Nutrients will vary depending on the food chosen. Carbohydrates are a source of energy and provide the raw materials to make parts of cells. Fats are also a source of energy. They form part of the structure of cells, protect and support internal organs, and act as insulation. Proteins are needed for tissue growth and repair, and they play a part in chemical reactions within cells. Vitamins act as helper molecules in some chemical reactions in the body. Minerals are needed in small amounts and have various functions. Water makes up most of the body’s fluids. The body’s vital processes take place in water.

2. Answers will vary, but should include one or more of the following: Fats, Oils, and Sweets; Milk, Yogurt, and Cheese Group; Meat, Poultry, Fish, Dry Beans, Eggs, and Nut Group; Vegetable Group; Fruit Group; and Bread, Cereal, Rice, and Pasta Group.

**Chapter Test**

1. a
2. a
3. d
4. b
5. c
6. b
7. d
8. a
9. c
10. c
11. mucus
12. peristalsis
13. Cholesterol
14. small intestine
15. large intestine
16. Digestion
17. true
18. gallbladder
19. true
20. villi
21. esophagus
22. stomach
23. small intestine
24. large intestine
25. Mechanical digestion involves physically breaking food down into smaller particles. Mechanical digestion begins in the mouth. The churning of the stomach completes this process. Chemical digestion involves breaking food molecules down into their smaller chemical building blocks. This process begins in the mouth with saliva. Digestive juices in the stomach and enzymes and other secretions in the small intestine finish the process.

26. Overall, lunch B is healthier. Pasta, tomato sauce, salad, and milk are all foods found lower on the pyramid. People need more of these foods than those found higher on the pyramid. The ice cream cone is made of milk and sugar, which should only be eaten sparingly. This meal also does not include fried foods like Lunch A.
The soda in Lunch A contains sugars that should only be eaten sparingly. Lunch A, however, does have a healthier dessert (applesauce) than does Lunch B.

27. Answers will vary. Menu should contain foods from each of the food groups in the recommended amounts. The Fats, Oils, and Sweets Group may be omitted.

28. A calorie is the amount of energy needed to raise the temperature of one gram of water by one degree Celsius. A Calorie is 1,000 calories, and is the unit used for energy content of food.

29. The digestive system breaks down food into smaller molecules that the body can use. The molecules are absorbed into the blood and carried throughout the body. Finally, wastes are eliminated from the body.

30. Answers may vary. Sample: Food labels allow you to evaluate a single food as well as compare the nutritional value of two foods. They contain such information as ingredient lists, serving size, Calories, Calories from fat, and Percent Daily Values.