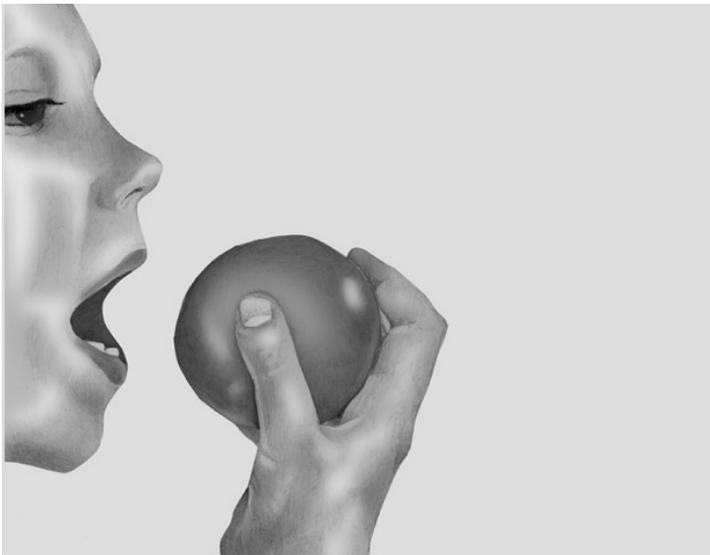


Food and Digestion

Teacher's Guide



Editors:

Brian A. Jerome, Ph.D.
Stephanie Zak Jerome

Assistant Editors:

Anneliese Brown
Hannah Fjeld
Louise Marrier

Graphics:

Lyndsey Canfield
Dean Ladago
Fred Thodal

A Message from our Company . . .

Visual Learning is a Vermont-based, family-owned company specializing in the creation of science programs. As former classroom science teachers we have designed our programs to meet the needs and interests of both students and teachers. Our mission is to help educators and students meet educational goals while experiencing the thrill of science!

Viewing Clearances

The video and accompanying teacher's guide are for instructional use only. In showing these programs, no admission charges are to be incurred. The programs are to be utilized in face-to-face classroom instructional settings, library settings, or similar instructional settings.

Duplication Rights are available, but must be negotiated with the *Visual Learning Company*.

Television, cable, or satellite rights are also available, but must be negotiated with the *Visual Learning Company*.

Closed circuit rights are available, and are defined as the use of the program beyond a single classroom but within a single campus. Institutions wishing to utilize the program in multiple campuses must purchase the multiple campus version of the program, available at a slightly higher fee.

Video streaming rights are available and must be negotiated with the *Visual Learning Company*.

Discounts may be granted to institutions interested in purchasing programs in large quantities. These discounts may be negotiated with the *Visual Learning Company*.

Use and Copyright:

The purchase of this video program entitles the user the right to reproduce or duplicate, in whole or in part, this teacher's guide and the black line master handouts for the purpose of teaching in conjunction with this video, *Food and Digestion*. The right is restricted only for use with this video program. Any reproduction or duplication, in whole or in part, of this guide and student masters for any purpose other than for use with this video program is prohibited.

The video and this teacher's guide are the exclusive property of the copyright holder. Copying, transmitting, or reproducing in any form, or by any means, without prior written permission from the copyright holder is prohibited (Title 17, U.S. Code Sections 501 and 506).

Copyright © 2008

ISBN 978-1-59234-244-0

Table of Contents

A Message from our Company	2
Viewing Clearances	2
Use and Copyright	2
National Standards Correlations	4
Student Learning Objectives	5
Assessment	6
Introducing the Program	7
Program Viewing Suggestions	7
Video Script	8
Answer Key to Student Assessments	12
Answer Key to Student Activities	13
Pre-Test	14
Post-Test	16
Video Review	18
Vocabulary	19
Writing Activity	20
Moving Through the Digestive System	21
Reading Food Labels	23
What's in That Food?	24
Go, Slow, or Whoa?	25

National Standards Correlations

Benchmarks for Science Literacy

(Project 2061 – AAAS) Grades 3–5

The Human Organism – Basic Functions (6C)

By the end of fifth grade, students should know that:

- From food, people obtain energy and materials for body repair and growth. The indigestible parts of food are eliminated.
- For the body to use food for energy and building materials, the food must first be digested into molecules that are absorbed and transported to cells.

The Human Organism – Physical Health (6E)

By the end of fifth grade, students should know that:

- Food provides energy and materials for growth and repair of body parts. Vitamins and minerals, present in small amounts in foods, are essential to keep everything working well.

National Science Education Standards

(Content Standards: K–4 and 5–8, National Academy of Sciences)

Life Science – Content Standard C

As a result of their activities in grades 5-8, all students should develop an understanding of:

Structure and Function in Living Systems

- The human organism has systems for digestion, respiration, reproduction, circulation, excretion, movement, control and coordination, and for protection from disease. These systems interact with one another.

Science in Personal and Social Perspectives – Content Standard F

As a result of their activities in grades K-4, all students should develop an understanding of:

Personal Health

- Nutrition is essential to health. Students should understand how the body uses food and how various foods contribute to health. Recommendations for good nutrition include eating a variety of foods, eating less sugar, and eating less fat.

Student Learning Objectives

Upon viewing the video and completing the enclosed student activities, students will be able to do the following:

- Explain the importance of food in providing energy and other materials the body needs to grow and maintain itself.
- Define nutrients as the building blocks that make up food. List the six kinds of nutrients: carbohydrates, proteins, fats, vitamins, minerals, and water.
- Cite examples of foods that contain an abundance of the six different nutrients.
- Define digestion as the process of breaking down food into materials the body can use.
- Identify the following key digestive organs on a diagram: esophagus, stomach, small intestine, and large intestine.
- Describe the role each digestive organ plays in the process of digestion.
- Differentiate between mechanical and chemical digestion.
- Explain the path food takes through the body. Be able to name and describe the function of the mouth, saliva, the esophagus, peristalsis, the stomach, chyme, the small intestine, villi, and the large intestine.
- Understand the role of eating a well-balanced diet, drinking water, exercising regularly, and seeing a physician each year in an effort to maintain a healthy digestive system and body.

Assessment

Preliminary Test (p. 14–15):

The Preliminary Test is an assessment tool designed to gain an understanding of students' preexisting knowledge. It can also be used as a benchmark upon which to assess student progress based on the objectives stated on the previous pages.

Post-Test (p. 16–17):

The Post-Test can be utilized as an assessment tool following student completion of the program and student activities. The results of the Post-Test can be compared against the results of the Preliminary Test to assess student progress.

Video Review (p. 18):

The Video Review can be used as an assessment tool or as a student activity. There are two sections. The first part contains questions displayed during the program. The second part consists of a five-question video quiz to be answered at the end of the video.

Introducing the Program

Before showing students the video program, hold six different types of foods in front of the class: a carrot, bread, cheese, low-fat yogurt, potato chips, and a glass of water. Ask students how the foods differ from one another. Students may respond by saying they have different tastes, are produced differently, and look differently. Write the term “nutrients” on the board. Explain to students that nutrients are the basic components of food. Nutrients provide the body with energy and are used for growth and repair of the body. Next, write the names of the following nutrients on the board: carbohydrates, proteins, fats, vitamins, minerals, and water. Explain to students that the food we eat is made up of these nutrients.

Go back to the original foods you showed the class. Explain that each of these foods have an abundance of specific nutrients. For example, bread is high in carbohydrates. Cheese is high in fat and protein. The low-fat yogurt has a lot of protein. If time remains, point out the food label on the container of yogurt and read aloud the nutrients listed. Tell students to pay close attention to the video to learn more about food, nutrients, and the process of digestion.

Program Viewing Suggestions

The student master “Video Review” (p. 18) is provided for distribution to students. You may choose to have your students complete this master while viewing the program or do so upon its conclusion.

The program is approximately 14 minutes in length and includes a five-question video quiz. Answers are not provided to the Video Quiz in the video, but are included in this guide on page 12. You may choose to grade student quizzes as an assessment tool or to review the answers in class.

The video is content-rich with numerous vocabulary words. For this reason you may want to periodically stop the video to review and discuss new terminology and concepts.

Video Script

1. What did you eat for breakfast this morning?
2. Maybe you had some cereal...
3. ...or toast and eggs.
4. What are foods made of and what happens to them inside your body?
5. What makes some foods...
6. ...different from other foods?
7. What sorts of food does your body need?
8. And what organs in our bodies digest food?
9. During the next few minutes, we are going to try to answer these questions and others as we investigate food and digestion.
- 10. Graphic Transition – Food and Nutrients**
11. At some point in your life you have probably felt really hungry.
- 12. You Decide!** Why does the body need food?
13. Food provides the body with energy as well as other materials to grow, repair itself, and to carry out the everyday body functions.
14. The body converts the food we eat into materials called nutrients.
15. Nutrients are the substances in food that the body needs to maintain itself.
16. There are six kinds of nutrients that the body needs: carbohydrates, proteins, fats, vitamins, minerals, and water.
17. Different foods contain various types of nutrients.
18. For example, foods such as pasta, breads, cereals, and fruits are high in carbohydrates.
19. Carbohydrates contain sugars which, when broken down, serve as the body's main source of energy.
20. Proteins, another nutrient, are abundant in foods such as fish, milk, poultry, beans, nuts, eggs, and dairy products.
21. Proteins play an important role in the growth and repair of the body, as well as serving as a source of energy.
22. Foods like bacon, butter, or ice cream are high in fat, another nutrient.
23. Too much fat has been linked to heart disease, weight gain, and certain types of cancer. However, the body still needs moderate amounts of fats for many important processes.
24. Fats are high-energy nutrients abundant in meats, cheeses, butter, and oils.
25. Most foods contain another nutrient – vitamins.
26. Oranges, for example, contain high amounts of Vitamin C and dark green vegetables are rich in Vitamins A, C, and K.
27. There are many different types of vitamins, which the body needs in small amounts to carry out a wide range of chemical reactions.
28. Minerals are another group of nutrients also needed by the body in small amounts.
29. Minerals are nutrients not made by living things but instead absorbed by plants and other living things.

Video Script

30. When we eat such plants or other living things, we obtain minerals that our body needs.
31. Calcium, for example, is a mineral needed to make strong bones and teeth.
32. Imagine going an entire day without drinking water or something like milk which is made mostly of water.
33. Water is essential to the survival of living things. In fact, a good part of the human body is made up of water.
34. Therefore, it is crucial to drink at least four to eight glasses of water per day.
- 35. Graphic Transition – What is Digestion?**
- 36. You Decide!** What is the role of digestion in the body?
37. Digestion is the process by which the body breaks down food into a simpler form that it can use.
38. The process of digestion in the human body is complex, involving many chemical reactions and various organs.
39. The digestive system is a group of organs that work together to digest food.
40. And, the digestive tract, more specifically, consists of a series of tube-like organs joined together to digest food.
- 41. Graphic Transition – Digestion Begins**
42. When you bite food and chew it, your teeth break it into smaller and smaller pieces.
43. The process of physically breaking apart food into smaller pieces is called mechanical digestion.
44. Liquid saliva in your mouth moistens food and makes it slippery, enabling you to swallow it.
45. Saliva also begins to chemically break down food.
46. This process of chemical digestion occurs when food is broken down by chemicals in the body.
47. Chemical and mechanical digestion work together to digest food, not only in the mouth, but throughout the entire digestive tract.
48. From the mouth, food is swallowed and forced into a long, straight tube called the esophagus.
49. The esophagus squeezes food down the tube with rhythmic muscular contractions, referred to as peristalsis.
- 50. Graphic Transition – Journey Through the Digestive Tract**
51. Food flows from the esophagus into the stomach.
- 52. You Compare!** How is the shape of the stomach different from that of the esophagus?
53. The stomach is bigger, rounder, and more bag-like than the straight esophagus.
54. And food is held in the stomach longer to allow for digestion.
55. First, food is mechanically broken down as muscular contractions squeeze and churn it.

Video Script

56. While that is going on, chemicals called enzymes and acids are secreted to break down food, forming a liquid, soup-like mixture known as chyme.
57. The action of squeezing food and mixing it with fluids is somewhat similar to the way clothes are cleaned in a washing machine.
58. After a few hours, chyme leaves the stomach and enters the small intestine.
59. The small intestine is a long, coiled tube about six meters long, or about the length of this car.
60. It is called small because it has a diameter of only about 2.5 centimeters.
61. The small intestine is bustling with chemical activity. In fact, nearly all chemical digestion of nutrients takes place here.
62. As food moves into the small intestine, it mixes with enzymes and chemicals that are secreted by other organs.
63. The liver and the pancreas, for instance, secrete chemicals which help break down different foods.
64. Once various foods are sufficiently broken down, they are absorbed by the small intestine.
65. This is an image of the inner lining of the small intestine.
- 66. You Observe!** Describe how it looks.
67. It looks rough and bumpy.
68. The inner surface of the small intestine is coated with millions of tiny bumps called villi. Villi greatly increase the surface area of the wall of the small intestine.
69. Nutrients are absorbed into tiny blood vessels found inside the villi.
70. Blood then carries the nutrients throughout the body.
71. By the time the remaining food material reaches the end of the small intestine, most nutrients have been absorbed.
72. Whatever materials are left are pushed into the large intestine.
73. While the large intestine is much shorter than the small intestine, it has a larger diameter of about 7.5 centimeters.
74. In the large intestine, a great deal of water is reabsorbed. What's left leaves the body as waste.
- 75. Graphic Transition – Tips for Eating Well**
76. It is important to take care of your digestive system so that you can enjoy good health throughout your lifetime.
77. One of the most important things you can do is to eat a well-balanced diet.
78. You wouldn't fuel a car with soft drinks,...
79. ... and similarly, you shouldn't fuel your body with candy, soda, and potato chips.
80. It is very important to eat a well-balanced diet consisting of a wide variety of foods from all the major food groups.
81. Regular exercise and getting enough rest are also important.

Video Script

82. You should also have a physical examination by a medical doctor once a year to ensure your digestive system and other body systems are healthy.

83. Graphic Transition – Summing Up

84. During the past few minutes we have investigated some of the fascinating features of food and digestion.

85. We began by discussing the six kinds of nutrients that the body needs: carbohydrates, proteins, fats, vitamins, minerals, and water.

86. We learned that digestion is the process by which the body breaks down food into a form that it can use.

87. We then followed the path that food takes through the digestive system, starting in the mouth, proceeding down the esophagus,...

88. ...and into the stomach, where it forms a soup-like mixture called chyme.

89. Chyme then goes from the stomach into the small intestine. Here a great deal of chemical digestion as well as absorption occurs.

90. Whatever materials not absorbed in the small intestine are pushed into the large intestine, eventually leaving the body as waste.

91. Last, we discussed the importance of eating a well-balanced diet, exercising, getting enough rest, and having a regular annual medical examination to maintain a healthy digestive system.

92. So, the next time you take a bite out of an apple...

93. ...or drink some water,...

94. ...think about some of the things we have discussed during the past few minutes.

95. You just might think about food and your digestion a little differently.

96. Graphic Transition – Video Assessment

97. Fill in the correct word to complete the sentence. Good luck and let's get started!

1. Fats, proteins, and minerals are examples of _____.

2. As soon as you bite a piece of food _____ begins.

3. The digestive system is a group of _____ that digest food.

4. Most chemical digestion of nutrients occurs in the _____ intestine.

5. It is very important to eat a well balanced _____.

Answer Key to Student Assessments

1. The body needs food because food provides energy and other materials it needs to grow and maintain itself.

Pre-Test (p. 14-15)

2. Digestion is the process by which the body breaks down food into a simpler form it can use.

3. The stomach has a bigger, rounder, more bag-like shape than the straight esophagus.

4. The inner lining of the small intestine looks rough and bumpy.

5. c - organs

6. nutrients

7. digestion

8. stomach

9. villi

10. eat a well-balanced diet

11. false

12. false

13. true

14. false

15. true

16. Examples include eating a well-balanced diet, regular exercise, getting enough rest, and seeing a doctor at least once a year.

17. The body needs the following six nutrients: carbohydrates, proteins, fats, vitamins, minerals, and water.

18. Digestion is the process by which the body breaks down food into a simpler form it can use.

19. In the process of mechanical digestion, food is physically broken into smaller pieces.

20. The esophagus, the stomach, the small intestine, and the large intestine are examples of organs that make up the digestive system.

Post-Test (p. 16-17)

1. c - broken down

2. d - eat a well-balanced diet

3. b - villi

4. a - stomach

5. d - nutrients

6. c - organs

7. b - food

8. b - chemical

9. d - mechanical

10. a - carbohydrates

11. false

12. true

13. false

14. true

15. false

16. In the process of mechanical digestion, food is physically broken into smaller pieces.

17. Digestion is the process by which the body breaks down food into a simpler form it can use.

18. The body needs the following six nutrients: carbohydrates, proteins, fats, vitamins, minerals, and water.

19. The esophagus, the stomach, the small intestine, and the large intestine are examples of organs that make up the digestive system.

20. Examples include eating a well-balanced diet, regular exercise, getting enough rest, and seeing a doctor at least once a year.

Video Review (p. 18)

Vocabulary (p. 19)

1. digestion

2. chyme

3. nutrients

4. chemical digestion

5. fat

6. esophagus

7. digestive system

8. water

9. saliva

10. large intestine

Answer Key to Student Activities

Writing Activity (p. 20)

The food we eat is made up of six main types of **nutrients**. Carbohydrates, **proteins**, fats, vitamins, minerals, and water provide important resources to the body. Food is broken down to a usable form through **digestion**. The digestive **system** consists of a group of organs working together to digest food. **Mechanical** digestion begins when food is chewed into smaller pieces. When swallowed, food passes down the **esophagus** to the stomach. There, food is broken down to form liquid **chyme**. In the **small** intestine, nutrients are broken down further by the process of **chemical** digestion. Finally water is absorbed in the **large** intestine. The remaining material exits the body as waste. It is important to care for your digestive system by eating well, exercising, and drinking lots of water.

In Your Own Words (p. 20)

1. Protein is abundant in meats, dairy products, and nuts. Carbohydrates are found in pasta, breads, and fruits. Fats are found in foods such as bacon, butter, and ice cream.
2. Digestion is the process of breaking down food into a form the body can use. Nutrients in food provide the body with energy and materials it needs to grow and maintain itself.
3. Mechanical digestion occurs when food is physically broken down. Chemical digestion occurs when chemicals break down food.

Moving Through the Digestive System (p. 21–22)

1. The esophagus directs food from the mouth to the stomach.
 2. The esophagus is a long, straight tube. The stomach has a curved, bag-like shape.
 3. The carrot is churned around in the stomach for several hours and then turns into chyme.
 4. Nutrients are absorbed into the body through villi in the small intestine.
 5. In the large intestine, water is absorbed before the remaining material exits the body as waste.
1. mouth 4. large intestine
2. esophagus 5. small intestine
3. stomach

Reading Food Label (p. 23)

1. Cereal
2. Cereal
3. Cereal is the best choice. Milk, fruit, and juice are examples of foods that could be combined with cereal to create a balanced breakfast.

What's in That Food? (p. 24)

Whole milk	carbohydrates, fat
Peas	carbohydrate, vitamins
Peanut butter	fat, protein
Orange juice	carbohydrates, water
Oatmeal	carbohydrate
Apple	carbohydrate, vitamins
Brown rice	carbohydrate
Tomato	vitamins, carbohydrate
Fried chicken	fat, protein
Scrambled eggs	protein
Chocolate pudding	minerals, carbohydrate
Strawberries	vitamins, carbohydrate
Kidney beans	protein, carbohydrate
Bacon	fat, protein
Spaghetti	carbohydrate
Grapefruit	vitamins, carbohydrate
French fries	fat, carbohydrate
String cheese	protein, minerals, fat
Tuna fish	protein, fat
Tortilla chips	carbohydrate, fat
Almonds	protein, fat

Go, Slow, or Whoa? (p. 25)

Doughnut	Whoa
Carrot	Go
Butter	Whoa
French bread	Slow
Grapefruit	Go
Hot dog	Whoa
Grilled fish	Go
Low-fat frozen yogurt	Slow
Sugary cereal	Whoa
2% milk	Slow
Potato chips	Whoa
Biscuits	Whoa
Bacon	Whoa
Nuts	Slow
Broccoli	Go
Fried clams	Whoa
Water	Go
Pepperoni	Whoa
Skim milk	Go
Fried mushrooms	Whoa
Creamy salad dressing	Slow
Skinless chicken breast	Go

Pre-Test

Name _____

Circle the best answer for each of the following questions.

- The body feels hungry when it needs:
a. *exercise* b. *food* c. *digestion* d. *water*
- Proteins, fats, vitamins, minerals, and water are all examples of:
a. *chyme* b. *carbohydrates* c. *organs* d. *nutrients*
- What nutrient provides the body with its main source of energy?
a. *carbohydrates* b. *minerals* c. *water* d. *vitamins*
- As a result of the process of digestion, food is:
a. *prepared* b. *maintained* c. *broken down* d. *destroyed*
- The stomach, small intestine, and large intestine are examples of digestive:
a. *bodies* b. *cells* c. *organs* d. *nerves*
- Chewing an apple into smaller pieces is an example of this kind of digestion:
a. *chemical* b. *moving* c. *artificial* d. *mechanical*
- In the small intestine, food is broken down mainly by the following type of digestion:
a. *mechanical* b. *chemical* c. *moving* d. *artificial*
- Food is transformed into chyme in this part of the digestive system:
a. *stomach* b. *esophagus* c. *large intestine* d. *small intestine*
- The small bumps and folds that absorb nutrients in the small intestine are called:
a. *chyme* b. *villi* c. *saliva* d. *organs*
- One of the best things you can do to care for your digestive system is:
a. *eat junk food* b. *drink less water* c. *clean it* d. *eat a well-balanced diet*

Pre-Test

Name _____

Write true or false next to each statement.

- 11. _____ Food does not change shape as it moves through the digestive system.
- 12. _____ All foods contain the same types of nutrients.
- 13. _____ The digestive system consists of a group of organs working together to digest food.
- 14. _____ Chyme is created in the large intestine.
- 15. _____ The esophagus carries food from the mouth to the stomach.

Write a short answer for each of the following.

- 16. Give two examples of things you can do to take care of your body.

- 17. List three of the six nutrients the body needs.

- 18. What is digestion?

- 19. Explain the process of mechanical digestion.

- 20. List three examples of organs that are part of the digestive system.

Post-Test

Name _____

Circle the best answer for each of the following questions.

- As a result of the process of digestion, food is:
a. *prepared* b. *maintained* c. *broken down* d. *destroyed*
- One of the best things you can do to care for your digestive system is:
a. *eat junk food* b. *drink less water* c. *clean it* d. *eat a well-balanced diet*
- The small bumps and folds that absorb nutrients in the small intestine are called:
a. *chyme* b. *villi* c. *saliva* d. *organs*
- Food is transformed into chyme in this part of the digestive system:
a. *stomach* b. *esophagus* c. *large intestine* d. *small intestine*
- Proteins, fats, vitamins, minerals, and water are all examples of:
a. *chyme* b. *carbohydrates* c. *organs* d. *nutrients*
- The stomach, small intestine, and large intestine are examples of digestive:
a. *bodies* b. *cells* c. *organs* d. *nerves*
- The body feels hungry when it needs:
a. *exercise* b. *food* c. *digestion* d. *water*
- In the small intestine, food is broken down mainly by the following type of digestion:
a. *mechanical* b. *chemical* c. *moving* d. *artificial*
- Chewing an apple into smaller pieces is an example of this kind of digestion:
a. *chemical* b. *moving* c. *artificial* d. *mechanical*
- What nutrient provides the body with its main source of energy?
a. *carbohydrates* b. *minerals* c. *water* d. *vitamins*

Post-Test

Name _____

Write true or false next to each statement.

- 11. _____ Chyme is created in the large intestine.
- 12. _____ The digestive system consists of a group of organs working together to digest food.
- 13. _____ All foods contain the same types of nutrients.
- 14. _____ The esophagus carries food from the mouth to the stomach.
- 15. _____ Food does not change shape as it moves through the digestive system.

Write a short answer for each of the following.

- 16. Explain the process of mechanical digestion.

- 17. What is digestion?

- 18. List three of the six nutrients the body needs.

- 19. List three examples of organs that are part of the digestive system.

- 20. Give two examples of things you can do to take care of your body.

Video Review

Name _____

While you watch the video, answer these questions:

You Decide!

1. Why does the body need food?

You Decide!

2. What is the role of digestion in the body?

You Compare!

3. How is the shape of the stomach different from that of the esophagus?

You Observe!

4. Describe how it looks.

After you watch the video, test your knowledge with these questions.

1. Fats, proteins, and minerals are examples of _____ .
2. As soon as you bite a piece of food _____ begins.
3. The digestive system is a group of _____ that digest food.
4. Most chemical digestion of nutrients occurs in the _____ intestine.
5. It is very important to eat a well balanced _____ .

Vocabulary

Name _____

Use these words to fill in the blanks next to the sentences below.

Words

chemical digestion esophagus saliva chyme digestive system
nutrients fat digestion water large intestine

- _____ The process by which the body breaks down food into a simpler form.
- _____ A liquid mixture formed in the stomach.
- _____ Substances in food the body needs to maintain itself.
- _____ The process that occurs when food is broken down by chemicals in the body.
- _____ An important nutrient that should be eaten in moderate amounts. It can cause health problems, such as heart disease, if too much is eaten.
- _____ The long, straight tube that transports food from the mouth to the stomach.
- _____ A group of organs that work together to digest food.
- _____ An essential nutrient that makes up much of the human body.
- _____ A substance in the mouth that moistens food, making it easier to swallow.
- _____ The organ responsible for absorbing water from food before it leaves the body as waste.

Writing Activity

Name _____

Words	chemical	esophagus	proteins	digestion	mechanical
	nutrients	small	system	chyme	large

Use the correct word from above to complete the sentences in the following paragraph.

The food we eat is made up of six main types of _____. Carbohydrates, _____, fats, vitamins, minerals, and water provide important resources to the body. Food is broken down to a usable form through _____. The digestive _____ consists of a group of organs working together to digest food. _____ digestion begins when food is chewed into smaller pieces. When swallowed, food passes down the _____ to the stomach. There, food is broken down to form liquid _____. In the _____ intestine, nutrients are broken down further by the process of _____ digestion. Finally, water is absorbed in the _____ intestine. The remaining material exits the body as waste. It is important to care for your digestive system by eating well, exercising, and drinking lots of water.

In Your Own Words

1. List three important nutrients and give examples of foods that contain each of them.

2. Define digestion and explain why the process is important.

3. Differentiate between mechanical digestion and chemical digestion.

Moving Through the Digestive System

Name _____

Background: What happens to food after you eat it? What organs make up the digestive system? And how does food move through the digestive system?

Let's discuss what happens when you take a bite of a carrot. First, the carrot is chewed in your mouth. Your teeth break the big piece into many smaller pieces. When you swallow, the small pieces of carrot move down your **esophagus** — the long, straight tube that connects the mouth and the stomach. Your **stomach** has a curved, bag-like shape and contains acids and other digestive juices that help digest food. When the carrot enters the stomach, it is churned around for several hours. It turns into a soupy liquid called **chyme**. The chyme then moves into your small intestine. The **small intestine** is a tube, more than six meters long! In the small intestine, many nutrients are absorbed through bumps and folds called **villi**. What is left of the carrot is then passed into the large intestine. The **large intestine** is shorter and wider than the small intestine. In the large intestine, water is absorbed before the remaining material exits the body as waste.

Activity: Read the information above and answer the following questions. Label the diagram on the next page.

Questions:

1. What is the role of the esophagus?

2. Compare the shape of the stomach with the shape of the esophagus.

3. What happens when the carrot enters the stomach?

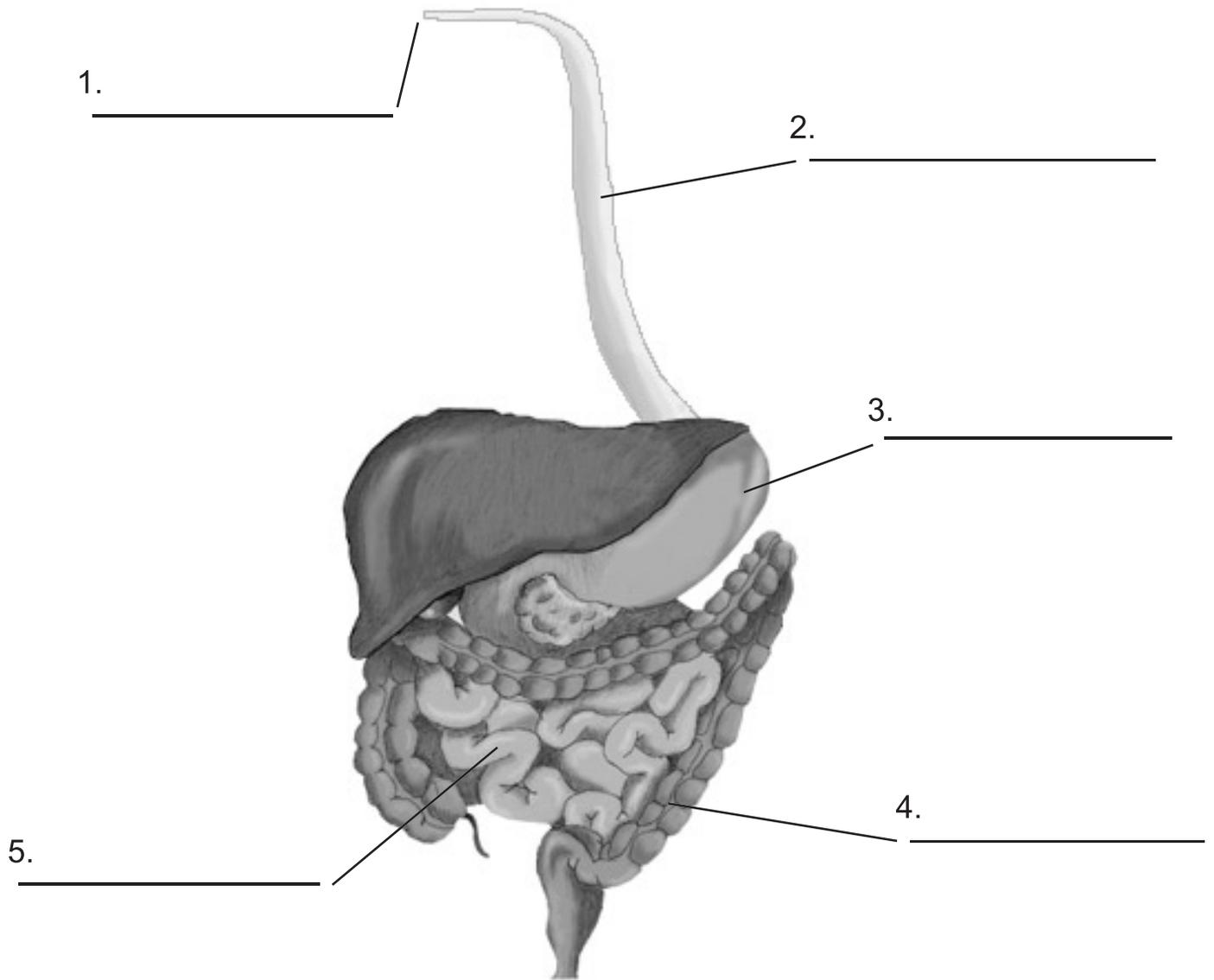
4. Where are nutrients absorbed into the body?

5. Describe the role of the large intestine.

Moving Through the Digestive System

Name _____

stomach esophagus mouth small intestine large intestine



Reading Food Labels

Name _____

Background: Have you noticed the black and white chart printed on the package of most foods? This chart is called a food label. Food labels have a lot of information about the nutritional value of a food, including how much of the food makes up a serving, the number of calories in a serving, and the amount of nutrients in a serving. Although the label looks complicated, it is actually fun and easy to read. Reading food labels is not hard — it just takes practice. People often say that breakfast is the most important meal of the day. It is a good idea to select healthy foods for breakfast to give you the right start. In this activity, you will compare the food labels of two common breakfast foods. Look closely at the two labels printed below. Use the information to answer the questions that follow.

Cereal

Nutrition Facts	
Serving Size	3/4 cup
Servings Per Container	about 14
Amount Per Serving	
Calories 110	Calories from Fat 15
% Daily Value*	
Total Fat 1.5g	2%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 190mg	8%
Potassium 115mg	3%
Total Carbohydrate 22g	7%
Dietary Fiber 2g	8%
Sugars 9g	
Protein 3g	
Vitamin A	10%
Vitamin C	10%
Calcium	10%
Iron	25%
Thiamin	25%
Riboflavin	25%
Niacin	25%
Vitamin B ₆	25%
Folic Acid	50%

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

Toaster Pastry

Nutrition Facts	
Serving Size	1 pastry
Servings Per Container	8
Amount Per Serving	
Calories 200	Calories from Fat 45
% Daily Value*	
Total Fat 5g	8%
Saturated Fat 2.5g	13%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 160mg	7%
Potassium 0g	0%
Total Carbohydrate 37g	12%
Dietary Fiber less than 1g	2%
Sugars 17g	
Protein 2g	
Vitamin A	10%
Vitamin C	0%
Calcium	0%
Iron	10%
Thiamin	10%
Riboflavin	10%
Niacin	10%
Vitamin B ₆	10%
Folic Acid	10%

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

Questions:

1. Calories are the amount of energy in a food. If you wanted to eat the fewest calories per serving, which is the best breakfast choice?
2. If you were choosing a food to eat based on the vitamin and mineral content of the food, which would you eat?
3. Which food is the best choice as part of a healthy breakfast? What other sorts of food could you eat along with it to have a balanced breakfast?

What's in That Food?

Name _____

Background: People eat thousands of different kinds of foods. However, there are just six major nutrients that make up foods. Nutrients are the building blocks of food. The six major nutrients are carbohydrates, proteins, fats, vitamins, minerals, and water. Not all foods contain an abundance of all six nutrients. Instead, most foods contain a large amount of one or two nutrients. Below is a list of foods that contain a large amount of these nutrients:

Carbohydrates are abundant in grains, fruits and fruit juices, and some vegetables, such as peas.

Proteins are found in meat, eggs, milk, and vegetables, such as beans and chick peas.

Fats are common in dairy products and lean meats. Fried foods and potato chips also contain fat.

Vitamins are found in all foods. For example, bananas contain a lot of potassium and citrus fruits contain a lot of Vitamin C.

Minerals are found in most foods, although some foods have more than others.

Water is an important part of many juices and other drinks.

Directions: Identify the main nutrient and write it in the box provided. Most foods contain more than one main nutrient — record this information in the last column.

Food	Nutrient	Nutrient
Whole milk		
Peas		
Peanut butter		
Orange juice		
Oatmeal		
Apple		
Brown rice		
Tomato		
Fried chicken		
Scrambled eggs		
Chocolate pudding		
Strawberries		
Kidney beans		
Bacon		
Spaghetti		
Grapefruit		
French fries		
String cheese		
Tuna fish		
Tortilla chips		
Almonds		

Go, Slow, or Whoa?

Name _____

Background: To maintain a healthy body, it is important to eat nutritious foods. Sometimes it may seem that a certain food is good for you, but in fact, it is high in calories or fat. To help people choose healthy foods, the National Institutes of Health developed a system in which they label foods as “go,” “slow,” or “whoa.” “**Go**” foods are low in fat, sugars, and calories and are high in minerals and vitamins. Examples of “go” foods include fruits and vegetables, whole-grain breads, and low-fat dairy products. These foods should be eaten often. “**Slow**” foods have more fat, calories, and added sugar than “go” foods. Examples of “slow” foods include fruit juice, white bread, pancakes, and peanut butter. Foods in this category should be eaten less often than foods in the “Go” category. “**Whoa**” foods have the highest amount of fat, calories, and added sugars. They should only be eaten once in a while, such as on special occasions. French fries, ice cream, and full-fat dairy products are examples of “whoa” foods.

Directions: Decide whether the foods listed below are Go, Slow, or Whoa foods.

Food	Go, Slow, or Whoa
Doughnut	
Carrot	
Butter	
French bread	
Grapefruit	
Hot dog	
Grilled fish	
Low-fat frozen yogurt	
Sugary breakfast cereal	
2% milk	
Potato chips	
Biscuits	
Bacon	
Nuts	
Broccoli	
Fried clams	
Water	
Pepperoni	
Skim milk	
Fried mushrooms	
Creamy salad dressing	
Skinless chicken breast	