**Respiration and Excretion**  
*Guided Reading and Study*

**The Respiratory System**

This section describes the parts of the respiratory system and how they work to help you breathe and speak.

**Use Target Reading Skills**

As you read, complete the flowchart below to show the path of air in the respiratory system. Write each step of the process in a separate box in the order in which it occurs.

**Path of Air**

1. Air enters the nose.
2. To the pharynx
3. 
4. 
5. 

**Respiratory System Functions**

1. Circle the letter of each sentence that is true about oxygen.
   a. The air you breathe is part of the Earth’s atmosphere, the blanket of gases that surrounds Earth.
   b. Oxygen makes up about 78 percent of the gases in the atmosphere.
   c. Your body uses all of the air that you breathe into your lungs.
   d. Most of the air you breathe in goes back into the atmosphere when you exhale.
The Respiratory System (continued)

2. What are two functions of the respiratory system?
   a. __________________________________________________________
   b. __________________________________________________________

3. ____________________________________ is needed for the energy-releasing chemical reactions that take place inside your cells.

4. What is respiration?
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________

5. List three products of respiration.
   a. __________________________________
   b. __________________________________
   c. ___________________________________

6. Is the following sentence true or false? To a scientist, breathing and respiration mean the same thing. ________________________

7. Circle the letters of the organ systems that make respiration possible.
   a. circulatory system
   b. reproductive system
   c. respiratory system
   d. digestive system

The Path of Air

8. Is the following sentence true or false? When you breathe in air, you also breathe in dust, pollen, and microorganisms. ________________________
9. Complete the flowchart to show the path of air as it travels to the lungs.

**The Path of Air**

- Air enters the body through two ____________________________, or openings, in the nose.
- Air moves through the ____________________________, which is also a part of the digestive system.
- Air moves into the ____________________________, or windpipe.
- Air moves through the ____________________________, passages that direct air into the lungs.

10. What does a sneeze do?

________________________________________________________________________
________________________________________________________________________

11. Another name for the pharynx is the _________________.

Match the parts of the nose with their functions.

<table>
<thead>
<tr>
<th>Parts</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>__ 12. nostrils</td>
<td>a. Moistens the air and traps particles in the air</td>
</tr>
<tr>
<td>__ 13. nasal cavities</td>
<td>b. Openings in the nose through which air enters</td>
</tr>
<tr>
<td>__ 14. mucus</td>
<td>c. Tiny hairlike extensions that sweep mucus into the throat</td>
</tr>
<tr>
<td>__ 15. cilia</td>
<td>d. Spaces lined with cilia and mucus</td>
</tr>
</tbody>
</table>
The Respiratory System (continued)

16. Circle the letter of each body part that is connected to the pharynx.
   a. stomach
   b. nose
   c. mouth
   d. ears

17. The walls of the trachea are made up of rings of ___________________ that strengthen the trachea and keep it open.

18. Is the following sentence true or false? The cilia and mucus in the trachea sweep upward, moving the mucus toward the nose where it is sneezed out. ___________________

19. If food enters the trachea, a person can _____________________.

20. Circle the letter of the respiratory organs that the air reaches after the bronchi.
   a. trachea
   b. nose
   c. lungs
   d. pharynx

21. Is the following sentence true or false? Inside the lungs, each bronchus divides into smaller and smaller tubes. ____________________

22. What happens in the alveoli?

   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________

Gas Exchange

23. What occurs during the process of gas exchange?

   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________

24. Why can the lungs absorb a large amount of oxygen?

   ___________________________________________________________________
   ___________________________________________________________________
25. Is the following sentence true or false? The more oxygen you need, the more slowly you breathe. ________________________

26. What is the diaphragm? __________________________________________________
________________________________________________________________________
________________________________________________________________________

27. Complete the cycle diagram to show the process of breathing.

Rib muscles and diaphragm contract, making the chest cavity ________________.

The air is squeezed out of the ________________, and you exhale.

The pressure of the air inside the lungs ________________.

Air rushes into the chest, and you ________________.

The rib muscles and diaphragm relax, and the chest cavity becomes ________________.

28. Another name for the voice box is the ________________.

29. What are vocal cords?
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

30. How do vocal cords create your voice?
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
The Respiratory System

Understanding Main Ideas
Answer the following on a separate sheet of paper.

1. How does respiration differ from breathing?
2. What are the two functions of the respiratory system?
3. Through what structures does air pass to get to the lungs?
4. What three ways does the respiratory system modify air before it reaches the lungs?
5. What gases are exchanged in the respiratory system?
6. How do you inhale and exhale?
7. How is the sound of your voice produced?

Building Vocabulary
Label the diagram with the parts of the respiratory system.

8. (Shared with digestive system)
9. 
10. 
11. (Sac of lung tissue where gas exchange takes place)
12. (Vibrate to produce voice)
13. (Voice box)
Smoking and Your Health

This section explains what harmful chemicals are in tobacco smoke and how these chemicals harm the body.

Use Target Reading Skills

As you read, identify the effects of smoking on the body. Write the information in the graphic organizer below.

<table>
<thead>
<tr>
<th>Cause</th>
<th>Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking</td>
<td>Increase in breathing and heart rate due to carbon monoxide in smoke</td>
</tr>
</tbody>
</table>

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Chemicals in Tobacco Smoke

1. Complete the table to show the harmful chemicals in tobacco smoke.

<table>
<thead>
<tr>
<th>Chemical</th>
<th>What It Is</th>
<th>How It Harms the Body</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carbon Monoxide</td>
<td>A drug that produces an addiction, or physical dependence</td>
<td></td>
</tr>
</tbody>
</table>

Health Problems and Smoking

2. Circle the letter of each sentence that is true about the effects of tobacco smoke.
   a. Tobacco smoke does not harm the respiratory system.
   b. Smokers cough frequently because their cilia cannot sweep away mucus.
   c. Smokers do not get as much oxygen because mucus buildup blocks air flow into the lungs.
   d. Heavy smokers can easily take part in vigorous sports.

3. List four respiratory problems that result from long-term smoking.
   a. __________________________  b. __________________________
   c. __________________________  d. __________________________

4. Is the following sentence true or false? Long-term, or chronic, bronchitis has no effect on the breathing passages. ______________________
Smoking and Your Health (continued)

5. A serious disease that destroys lung tissue and causes difficulty in breathing is ________________________.

6. What causes emphysema?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

7. Is the following sentence true or false? Cigarette smoke has over 50 different chemicals that cause cancer. ________________________

8. How do the chemicals in tobacco smoke affect blood vessels?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

9. Is the following sentence true or false? Smokers are more likely to have heart attacks than nonsmokers. ________________________

10. What is passive smoking?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Smoking and Your Health

Understanding Main Ideas

Answer the following on a separate sheet of paper.

1. What are three of the most harmful chemicals in tobacco smoke?
2. How does tar affect the cilia in your respiratory system and why is this harmful?
3. How does inhaling carbon monoxide decrease the oxygen level in your blood?
4. Describe how bronchitis, emphysema, and lung cancer affect the respiratory system.
5. How is smoking related to atherosclerosis?
6. How does smoking affect the likelihood a person will have a heart attack?

Building Vocabulary

Match each term with its definition by writing the letter of the correct definition in the right column on the line beside the term in the left column.

<table>
<thead>
<tr>
<th></th>
<th>7. addiction</th>
<th>a. a dark, sticky substance produced when tobacco burns</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8. bronchitis</td>
<td>b. a dangerous, colorless, and odorless gas</td>
</tr>
<tr>
<td></td>
<td>9. carbon monoxide</td>
<td>c. irritation of the breathing passages</td>
</tr>
<tr>
<td></td>
<td>10. emphysema</td>
<td>d. a drug that speeds the activities of the nervous system and heart</td>
</tr>
<tr>
<td></td>
<td>11. nicotine</td>
<td>e. a disease that destroys lung tissue</td>
</tr>
<tr>
<td></td>
<td>12. tar</td>
<td>f. a physical dependence on a substance</td>
</tr>
</tbody>
</table>
The Excretory System

This section explains how the parts of the excretory system work.

Use Target Reading Skills

Before you read, preview Figure 11. Then write two questions that you have about the diagram in the graphic organizer below. As you read, answer your question.

Q. Where are the nephrons located?

A.

Q.

A.

Introduction

1. What is the function of the excretory system?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

2. The process of removing wastes from the body is ________________________.

The Excretory System

3. What are two wastes that the body must get rid of?

________________________________________________________________________

________________________________________________________________________

Match the term with its definition.

<table>
<thead>
<tr>
<th>Terms</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. urea</td>
<td>a. The major organs of the excretory system</td>
</tr>
<tr>
<td>5. kidneys</td>
<td>b. A watery fluid that contains urea and other wastes</td>
</tr>
<tr>
<td>6. urine</td>
<td>c. A chemical that comes from the breakdown of proteins</td>
</tr>
</tbody>
</table>
7. Complete the flowchart to show how wastes are removed from the body.

Removing Wastes

- Blood flows through the kidneys.
- Kidneys filter the ____________, removing the wastes.
- Urine flows from the kidneys through two narrow tubes called ____________ to a sacklike muscular organ called the ____________, which stores urine.
- When the bladder is full, urine flows out of the body through a tube called the ____________.

Filtration of Wastes

8. What are nephrons?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

9. What are the stages of urine formation?
   a. ______________________________________________________________________
   ______________________________________________________________________
   ______________________________________________________________________
   b. ______________________________________________________________________
   ______________________________________________________________________
Respiration and Excretion  •  Guided Reading and Study

10. Is the following sentence true or false? Urea and glucose stay in the capillaries while blood cells and protein molecules move into the capsule of a nephron. ________________________

11. List the substances that are returned to the blood and those that stay in the kidneys after the kidneys filter the blood.
   Returned to blood: ________________________
   Stay in kidneys: ________________________

12. Why is a chemical analysis of urine useful to doctors?
   ____________________________________________________________________________
   ____________________________________________________________________________
   ____________________________________________________________________________
   ____________________________________________________________________________

Excretion and Homeostasis

13. The kidneys help maintain homeostasis by regulating the amount of ________________ in the body.

14. Is the following sentence true or false? If you’ve been sweating a lot and haven’t had much to drink, your body will absorb less water and produce a larger volume of urine. ________________________

15. What are three other organs of excretion, not including the kidneys?
   a. ________________________  b. ________________________
   c. ________________________

16. What is the function of the liver?
   ____________________________________________________________________________
   ____________________________________________________________________________
   ____________________________________________________________________________
**Respiration and Excretion**  ·  *Review and Reinforce*

**The Excretory System**

**Understanding Main Ideas**

*Answer the following on a separate sheet of paper.*

1. What are three substances that the excretory system removes from the body?
2. Describe the path of urine through the body from its formation to its elimination from the body.
3. What is the main organ of excretion? What are three other organs of excretion?
4. How do the kidneys maintain water balance in the body?
5. Where in the body are nephrons? Briefly describe the two-stage process in which they help to produce urine.

*Label the diagram with the names of the parts of the excretory system.*

6. ________
7. ________
8. ________
9. ________

**Building Vocabulary**

*Answer the following in the spaces provided.*

10. What is excretion?

________________________________________________________________________
________________________________________________________________________

11. Compare and contrast the ureters and the urethra.

________________________________________________________________________
________________________________________________________________________

12. What is urea?

________________________________________________________________________
________________________________________________________________________

13. What is urine?

________________________________________________________________________
________________________________________________________________________