CHAPTER 12
CIRCULATION

SECTION 12-1 The Body’s Transportation System
(pages 400–406)

This section describes how the heart, blood vessels, and blood work together to carry materials throughout the body.

► Movement of Materials (pages 400–401)

1. Another name for the cardiovascular system is the __________ system.

2. Complete this concept map to show what makes up the cardiovascular system.

   Cardiovascular system
   
   is made up of
   
   Heart

3. What three things are carried throughout the body by the cardiovascular system? ______________________

   ______________________

   ______________________

► Structure and Function of the Heart (pages 402–403)

4. Each time the heart beats, what does it do to blood? ________________

   ______________________
5. Complete the table about the chambers of the heart.

<table>
<thead>
<tr>
<th>Chambers of the Heart</th>
</tr>
</thead>
<tbody>
<tr>
<td>Questions</td>
</tr>
<tr>
<td>What are these chambers called?</td>
</tr>
<tr>
<td>How many are there?</td>
</tr>
<tr>
<td>What is the function, or job, of these chambers?</td>
</tr>
</tbody>
</table>

6. A flap of tissue that prevents blood from flowing backward is a(n) ____________.

**Regulation of Heartbeat (page 404)**

7. The group of cells that adjusts the speed of heart beat is called the _____________. The heart rate depends on how much ____________ the body needs.

8. What does an artificial pacemaker do? ________________

**Two Loops (pages 404–406)**

9. Name the three kinds of blood vessels. ________________

10. Describe the loop in which the blood picks up oxygen. ________________
11. Draw arrows on the diagram at the right to show how blood circulates through the body. The first arrow should start in the right ventricle.

12. The largest artery in the body is call the ________________.

► The Force of the Ventricles (page 406)

13. What causes the force that pushes blood throughout your body? ________________

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SECTION 12–2 A Closer Look at Blood Vessels
(pages 407–411)

This section describes three kinds of blood vessels that are found in your body.

► Arteries (pages 407–409)

1. Arteries carry blood away from the ________________.

2. Is the following sentence true or false? The coronary arteries provide the stomach with its blood supply. ________________

3. Circle the letter of each sentence that is true about pulse.
   a. The faster your heart beats, the slower your pulse will be.
   b. Pulse is caused by the expanding and narrowing of artery walls.
   c. When you count pulse beats, you are also counting heartbeats.
   d. You can feel pulse in veins but not in arteries.

4. Is the following sentence true or false? Arteries control the amount of blood that different organs receive. ________________
CHAPTER 12, Circulation (continued)

▶ Capillaries (page 409)

5. What important thing happens in the capillaries? ________________
   ______________________________________________________________________
   ______________________________________________________________________

6. One process in which materials are exchanged between the blood and the
   body cells is ________________.

▶ Veins (page 410)

7. What job do veins carry out? ____________________________________________
   ______________________________________________________________________

8. What three things help push blood through veins?
   a. _____________________________________________________________________
   b. _____________________________________________________________________
   c. _____________________________________________________________________

▶ Blood Pressure (pages 410–411)

9. What is blood pressure? _____________________________________________
   ______________________________________________________________________

10. Is the following sentence true or false? Blood flowing through arteries exerts
    the highest pressure. ________________

Reading Skill Practice

By looking carefully at photographs and illustrations in textbooks, you can help yourself
understand what you have read. Look carefully at Figure 9 on page 410. What important idea
does this photograph communicate?
SECTION 12–3  Blood and Lymph  (pages 413–418)

This section explains what blood is made of and describes the jobs performed by the different parts of blood. This section also describes the lymphatic system.

► Introduction (page 413)

1. What is the name for the liquid part of blood? ________________

2. Complete the concept map below by naming the types of cells that are found in blood.

   ![Concept Map]

   Cells in blood
   
   include
   
   Red blood cells
   
   __________
   
   __________

► Plasma (page 413)

3. What is plasma mostly made up of? ________________

4. List four kinds of materials that are carried in plasma.

   a. ________________
   
   b. ________________
   
   c. ________________
   
   d. ________________

► Red Blood Cells (pages 414–415)

5. What job do red blood cells perform in the body? ________________

   ________________
6. What is hemoglobin, and where is it found?  

   ______________________________________________________
   ______________________________________________________
   ______________________________________________________
   ______________________________________________________

**White Blood Cells (page 415)**

7. What is the job of white blood cells?  

   ______________________________________________________

8. List four ways in which white blood cells are different from red blood cells.
   a.   ______________________________________________________
   b.   ______________________________________________________
   c.   ______________________________________________________
   d.   ______________________________________________________

**Platelets (page 416)**

9. Is the following sentence true or false? Platelets are pieces of cells.
   ______________________________________________________

10. Describe how a blood clot forms.  
    ______________________________________________________
    ______________________________________________________
    ______________________________________________________

**Blood Types (pages 416–417)**

Match the blood type with the kinds of clumping proteins in its plasma.

<table>
<thead>
<tr>
<th>Blood Type</th>
<th>Clumping Proteins in Its Plasma</th>
</tr>
</thead>
<tbody>
<tr>
<td>____ 11. A</td>
<td>a. no clumping proteins</td>
</tr>
<tr>
<td>____ 12. B</td>
<td>b. anti-B proteins</td>
</tr>
<tr>
<td>____ 13. AB</td>
<td>c. both anti-A and anti-B proteins</td>
</tr>
<tr>
<td>____ 14. O</td>
<td>d. anti-A proteins</td>
</tr>
</tbody>
</table>
15. What is a blood transfusion?

16. Why can’t a person with blood type A safely receive a transfusion of blood type B?

► The Lymphatic System (page 418)

17. What is the lymphatic system?

18. The fluid inside the lymphatic system is called ____________.

19. How do lymph nodes help fight disease?

SECTION 12–4 Cardiovascular Health (pages 420–424)

This section describes diseases of the cardiovascular system. The section also identifies steps that people can take to help prevent these diseases.

► Cardiovascular Disease (page 421)

1. What is atherosclerosis?

2. What is cholesterol?
CHAPTER 12, Circulation (continued)

3. Complete the flowchart below, which describes what can happen when atherosclerosis develops in the coronary arteries.

Atherosclerosis

Atherosclerosis develops in coronary arteries.

Heart muscle receives less ________________, and therefore its cells receive less ________________.

A(n) ________________ occurs, which means that blood flow to part of the heart is blocked.

▶ Hypertension (pages 421–423)

4. What is hypertension? ________________________________________________

____________________________________________________________________

5. Give two reasons why hypertension is a serious problem. ____________

____________________________________________________________________

____________________________________________________________________

6. What is done to treat hypertension? _________________________________

____________________________________________________________________

____________________________________________________________________
Keeping Your Cardiovascular System Healthy (page 424)

7. To help maintain cardiovascular health, people should eat a diet that is low in these substances.
   a. 
   b. 
   c. 

8. Is the following sentence true or false? Even if smokers quit, they cannot decrease their risk of death from cardiovascular disease. 

9. In the table below, explain why each behavior is important for cardiovascular health.

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Why It Is Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Getting a lot of exercise</td>
<td></td>
</tr>
<tr>
<td>Eating healthy foods</td>
<td></td>
</tr>
<tr>
<td>Not smoking</td>
<td></td>
</tr>
</tbody>
</table>

Reading Skill Practice

Outlining is a way to help yourself understand and remember what you have read. Write an outline of this section on cardiovascular health. In an outline, copy the headings in the textbook. Under each heading, write the main idea of that part of the lesson. Then list the details that support that main idea.
CHAPTER 12, Circulation (continued)

Word Wise

See how fast you can solve this crossword puzzle. You’ll need to use what you’ve learned about the cardiovascular system. Go!

Clues down
1. Tiny blood vessels in which substances are exchanged between the blood and body cells
2. The liquid part of blood
3. The kind of artery that supplies blood to the heart itself
9. A blood vessel that carries blood back to the heart

Clues across
4. A group of cells located in the right atrium that regulates heartbeat rate
5. The alternating expansion and contraction of artery walls caused by the contraction and relaxation of the ventricles; can be felt if you touch your wrist
6. To keep your heart healthy, you should limit this in the food you eat.
7. A chamber of the heart that receives blood that comes into the heart
8. A flap of tissue that prevents blood from flowing backward
10. The fluid that the lymphatic system collects and returns to the bloodstream