As you read Chapter 23, which begins on page 544 of your textbook, answer the following questions.

This Really Happened . . . (p. 544)
1. What can doctors do if a person’s heart fails?

2. In this chapter, you will study all of the following systems EXCEPT
   a. the respiratory system.  
   b. the digestive system.  
   c. the cardiovascular system.  
   d. the lymphatic system.

What Do You Think? (p. 545)
Answer these questions in your ScienceLog now. Then later, you’ll have a chance to revise your answers based on what you’ve learned.

Investigate! (p. 545)
3. What causes the throbbing called a pulse?

Section 1: The Cardiovascular System (p. 546)
4. The system that transports materials to and from your
   ___________________________ is made up of blood, the
   ___________________________ , and blood
   ___________________________.

What Is Blood? (p. 546)
5. Your blood is a type of connective tissue.
   True or False? (Circle one.)
6. Which of the following make up the plasma? (Circle all that apply.)
   a. red blood cells  e. minerals
   b. water  f. white blood cells
   c. proteins  g. nutrients
   d. platelets  h. sugars

7. How does the shape of a red blood cell make it especially well suited for its job?
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________

Mark each of the following statements True or False.
8. ________ Hemoglobin is a cell that helps to transport the oxygen you inhale to the rest of your body.
9. ________ The bone marrow is where red blood cells are produced.
10. ________ Red blood cells have a relatively short life span because they have no DNA and cannot make proteins.

Answer questions 11–15 after you finish reading about white blood cells on page 547. Choose the term in Column B that best matches the phrase in Column A, and write the corresponding letter in the space provided.

<table>
<thead>
<tr>
<th>Column A</th>
<th>Column B</th>
</tr>
</thead>
<tbody>
<tr>
<td>_____ 11. a tiny particle that can make you sick</td>
<td>a. antibody</td>
</tr>
<tr>
<td>_____ 12. a chemical that some WBCs release to help fight intruders</td>
<td>b. pathogen</td>
</tr>
<tr>
<td>_____ 13. formed in the bone marrow</td>
<td>c. white blood cell</td>
</tr>
<tr>
<td>_____ 14. where some WBCs mature</td>
<td>d. lymphatic organ</td>
</tr>
</tbody>
</table>

15. Which of the following statements are true of platelets? (Circle all that apply.)
   a. They last for 5 to 10 days.
   b. They pinch off fragments of themselves to form a blood clot.
   c. They are fragments of larger cells.
   d. They help reduce blood loss.
Have a Heart (p. 548)

16. Your heart is a four-chambered muscular organ about the size of your
   a. stomach.          c. liver.
   b. nose.            d. fist.

17. What causes the lub-dub sounds of your heartbeat?

Use the diagram on page 548 to place the following steps of blood flow through the heart in the correct order. Write the appropriate number in the space provided.

18. ____ Blood is squeezed into the ventricles when the atria contract.
19. ____ Blood enters the atria.
20. ____ Blood is pushed out of the heart when the atria relax and the ventricles contract.

Blood Vessels (p. 549)

21. Look at Figure 6. Capillaries connect

   ________________ to

   ________________
   (large veins or small veins, large arteries or small arteries)

Choose the type of blood vessel in Column B that best matches the description in Column A, and write the corresponding letter in the space provided. Types of blood vessels can be used more than once.

<table>
<thead>
<tr>
<th>Column A</th>
<th>Column B</th>
</tr>
</thead>
<tbody>
<tr>
<td>____ 22. smallest blood vessels in the body</td>
<td>a. arteries</td>
</tr>
<tr>
<td>____ 23. direct blood away from the heart</td>
<td>b. capillaries</td>
</tr>
<tr>
<td>____ 24. many substances can diffuse through their walls</td>
<td>c. veins</td>
</tr>
<tr>
<td>____ 25. direct blood back to the heart</td>
<td></td>
</tr>
<tr>
<td>____ 26. push blood with the help of skeletal muscles</td>
<td></td>
</tr>
<tr>
<td>____ 27. very close to all living cells in the body</td>
<td></td>
</tr>
<tr>
<td>____ 28. have thick walls to withstand pressure</td>
<td></td>
</tr>
</tbody>
</table>
Going with the Flow  (p. 550)

29. Pulmonary circulation is the process during which blood obtains oxygen from the lungs. True or False? (Circle one.)

30. Systemic circulation is the circulation of blood between the heart and the lungs. True or False? (Circle one.)

Use the diagram on page 550 to answer the following questions. Indicate whether each of the following statements is a part of pulmonary or systemic circulation. In the space provided, write P if it is part of pulmonary circulation and S if it is part of systemic circulation.

31. ___ Oxygen-poor blood travels through arteries to the lungs.
32. ___ Oxygen-poor blood is delivered to the right atrium of the heart by two large veins.
33. ___ The blood releases carbon dioxide and absorbs oxygen.
34. ___ Oxygen, nutrients, and water are delivered to the body's cells.
35. ___ Oxygen-rich blood pumps from the left ventricle into arteries.

Blood Flows Under Pressure  (p. 551)

36. How is blood running through your veins like water running through a hose?

___________________________________________________________________________
___________________________________________________________________________
___________________________________________________________________________

37. The units that blood pressure is reported in are _____________.

38. Figure 8 shows a person getting his blood pressure checked. How might your blood pressure indicate a problem with your cardiovascular system?

___________________________________________________________________________
___________________________________________________________________________
___________________________________________________________________________

___________________________________________________________________________

Chapter 23, continued
39. In a normal blood pressure reading of 120/80, the number 80 stands for the pressure in the
   a. arteries when the ventricles relax.
   b. arteries when the ventricles contract.
   c. ventricles when the ventricles relax.
   d. ventricles when the ventricles contract.

Exercise and Blood Flow (p. 551)
Mark each of the following statements True or False.

40. ________ When you exercise, blood flow is reduced to the brain, heart, and lungs so that more blood can go to the muscles.

41. ________ Some of your organs, like your kidneys, do not need as much oxygen when you exercise.

42. ________ When you exercise, more oxygen and nutrients are being delivered to your muscles.

43. ________ When you stop exercising, your heart rate slows down.

44. ________ Your brain can regulate the amount of blood flow throughout the body.

Review (p. 551)
Now that you’ve finished reading the first part of Section 1, review what you’ve learned by answering the Review questions in your ScienceLog.

What’s Your Blood Type? (p. 552)
45. Is it safe to give a person blood of any type? Explain.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

46. Everyone has type ________________, ________________, ________________, or ________________ blood.
Each of the following statements is false. Change the underlined word to make the statement true. Write the new word in the space provided.

47. Blood type is determined by the antibodies present on the surface of your red blood cells.

48. Type O blood has both A and B antigens.

49. Certain chemicals in plasma, called enzymes, can bind to RBCs and cause the RBCs to clump together.

50. Type O people are universal recipients.

Cardiovascular Problems (p. 553)

51. Cardiovascular problems occur only in the heart. True or False? (Circle one.)

52. What is wrong with the blood vessel shown in Figure 10?

53. Which of the following statements is NOT true about hypertension?
   a. It is promoted by atherosclerosis.
   b. It weakens blood vessels.
   c. It is an abnormally low blood pressure.
   d. It can lead to a stroke.
54. List three things mentioned in the text that can cause cardiovascular disease.

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

**Review** (p. 553)
Now that you’ve finished Section 1, review what you learned by answering the Review questions in your ScienceLog.

**Section 2: The Lymphatic System** (p. 554)
1. Your cells are bathed in fluid. What happens to that fluid?

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

2. The lymphatic system and the cardiovascular system are both ________________ systems.

**Vessels of the Lymphatic System** (p. 554)
3. Besides fluid, the lymph also contains ________________ that are too large to enter the blood capillaries.

4. Lymph is carried into lymphatic vessels by ________________, the smallest vessels of the lymphatic system.

5. Lymph is not pushed through the lymphatic system by a pump. How does it move?

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________