

Science 9-Biology

Worksheet 9-1—Blood and the Circulatory System



10

Name \_\_\_\_\_

Due Date \_\_\_\_\_

Show Me  Hand In

*Correct and Hand In Again By* \_\_\_\_\_

Read pages 170-179 of SP to help you answer the following questions:

1. Your circulatory system carries \_\_\_\_\_ and nutrients (both necessary for \_\_\_\_\_ respiration) to your cells and \_\_\_\_\_ away from your cells.
2. Blood is carried to within \_\_\_\_\_ cm or each and every cell in the body.
3. What could happen to cells in a body part if the blood was cut off for a period of time?  
\_\_\_\_\_
4. The **liquid** portion of blood is called \_\_\_\_\_ it is about 92% \_\_\_\_\_ and 8% \_\_\_\_\_ dissolved in water.
5. Name five substances or types of substances that are dissolved in the liquid portion of our blood.  
\_\_\_\_\_  
\_\_\_\_\_
6. People with **hemophilia** have blood that does not clot properly. Explain why this is so.  
\_\_\_\_\_
7. What is the function of **antibodies** that are carried in the blood? \_\_\_\_\_  
\_\_\_\_\_

8. Adrenalin is a type of blood protein called a \_\_\_\_\_. It is produced in the \_\_\_\_\_ gland just above the kidney. However, it acts on different parts of the body like the respiratory system and the heart. How does it move in the body?  
\_\_\_\_\_
9. About \_\_\_\_\_% of your blood’s volume is liquid (plasma) and about \_\_\_\_\_% is solids, which consist of blood \_\_\_\_\_ and \_\_\_\_\_ (see margin page 172)
10. Red blood cells contain the protein called \_\_\_\_\_ which grabs oxygen and carries it to the cells of the body where it is used.
11. Your red blood cells pick up oxygen in the \_\_\_\_\_ in the lungs and release it near the cells of the body.
12. The mineral \_\_\_\_\_ is needed by the body to make hemoglobin. Adults don’t need as much iron as teenagers because some of the iron is \_\_\_\_\_ when the red blood cells die.
13. Your body contains approximately \_\_\_\_\_ red blood cells. The average lifetime of a red blood cells is about \_\_\_\_\_ days ( \_\_\_\_\_ months).
14. Where are red blood cells manufactured? \_\_\_\_\_
15. Your body replaces red blood cells at a rate of about \_\_\_\_\_ per second.
16. An organ called the \_\_\_\_\_ breaks down dead red blood cells.  
Where does the hemoglobin go? \_\_\_\_\_  
Where does the iron go? \_\_\_\_\_
17. What is the main function of white blood cells? \_\_\_\_\_  
\_\_\_\_\_
18. Name three places in the body where white blood cells are produced? \_\_\_\_\_  
\_\_\_\_\_

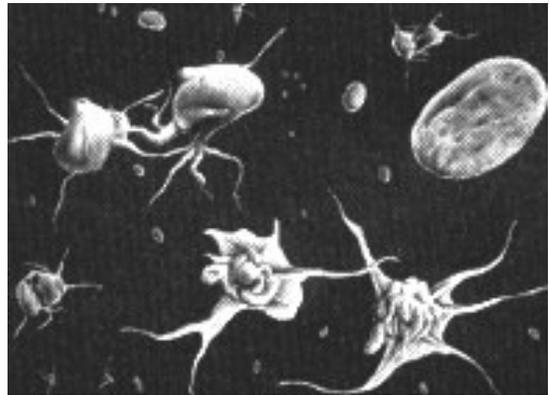
19. What happens to a persons “white blood cell count” during a bacterial infection somewhere in the body? \_\_\_\_\_

Why does the body do this? \_\_\_\_\_  
\_\_\_\_\_

20. A very high white blood cell count may also indicate a type of cancer called \_\_\_\_\_.

21. When there is damage to a blood vessel, \_\_\_\_\_ collect where the damage is. They release chemicals that cause \_\_\_\_\_  
\_\_\_\_\_

22. These are called \_\_\_\_\_  
They release \_\_\_\_\_  
\_\_\_\_\_  
They are (*larger/smaller*) \_\_\_\_\_  
than other types of blood cells.



23. These are called \_\_\_\_\_  
\_\_\_\_\_

They contain \_\_\_\_\_  
which helps transport oxygen. These are the most numerous type of blood cell.



24. This is an example of a \_\_\_\_\_  
 \_\_\_\_\_

Their main function is to \_\_\_\_\_  
 and kill \_\_\_\_\_



25. Any blood vessels that carry blood **away from** your heart are called \_\_\_\_\_

26. Blood vessels which return blood **to** the heart are called \_\_\_\_\_

27. What are **capillaries**? \_\_\_\_\_

28. Which type of blood vessels have thick muscular walls? \_\_\_\_\_

Why do you think these vessels need thick walls? \_\_\_\_\_

What do the muscles in the walls of these vessels do? \_\_\_\_\_

29. Which type of blood vessels get closest to all of your cells? \_\_\_\_\_

30. Which type of blood vessels have the thinnest walls? \_\_\_\_\_

What passes through these walls? \_\_\_\_\_

\_\_\_\_\_

31. After your heart pumps blood into the arteries, why doesn't it go right back into the heart? \_\_\_\_\_

32. The rhythm of the pumping of your heart can be felt in the arteries which come close to the surface of your skin. This rhythm is called your \_\_\_\_\_

33. What is meant by heart rate? \_\_\_\_\_

34. What is your resting heart rate (measure it) \_\_\_\_\_

35. How can a doctor or first aid attendant tell when an artery has been severed? \_\_\_\_\_

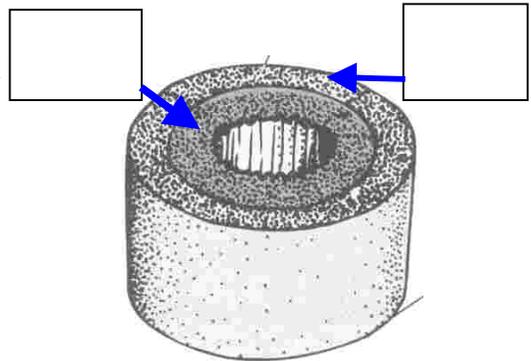
\_\_\_\_\_

36. Do nutrients and oxygen pass through the walls of your arteries and into your cells? \_\_\_\_  
 Explain why or why not. \_\_\_\_\_

37. What type of blood vessels do oxygen and CO<sub>2</sub> easily pass through? \_\_\_\_\_

38. The walls of your \_\_\_\_\_ are elastic. They stretch when they are full of blood.

39. The picture is a cross section of a blood vessel \_\_\_\_\_  
 called \_\_\_\_\_.



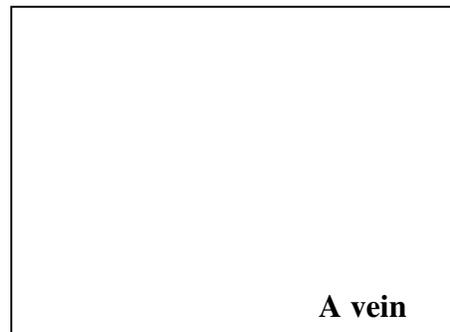
**Label** the two layers in the diagram.

40. This type of blood vessel is called a \_\_\_\_\_

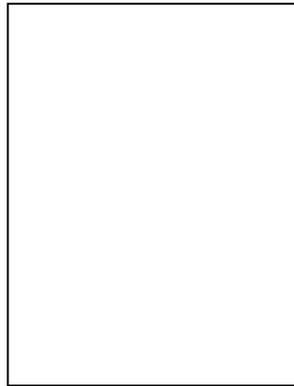
They have very \_\_\_\_\_  
 walls, which \_\_\_\_\_,  
 \_\_\_\_\_ & \_\_\_\_\_  
 can pass through.



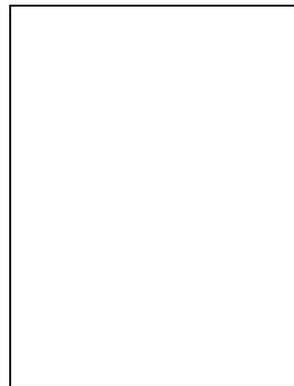
41. A blood vein has \_\_\_\_\_ layers.  
 One is very stretchy to allow for expansion.  
 In the space to the right, draw a diagram  
 showing the cross section of a vein. Label  
 the layers.



42. Do the walls of veins help push blood back to the heart? \_\_\_\_\_ Why or why not? \_\_\_\_\_
43. How do the muscles of the body help blood get back to the heart? \_\_\_\_\_
44. What is the purpose of one-way valves in the veins? \_\_\_\_\_
45. Draw a diagram showing a one way valve open and the same valve closed, showing the direction of blood flow in each case. See the pictures on the top of page 176 of SP.



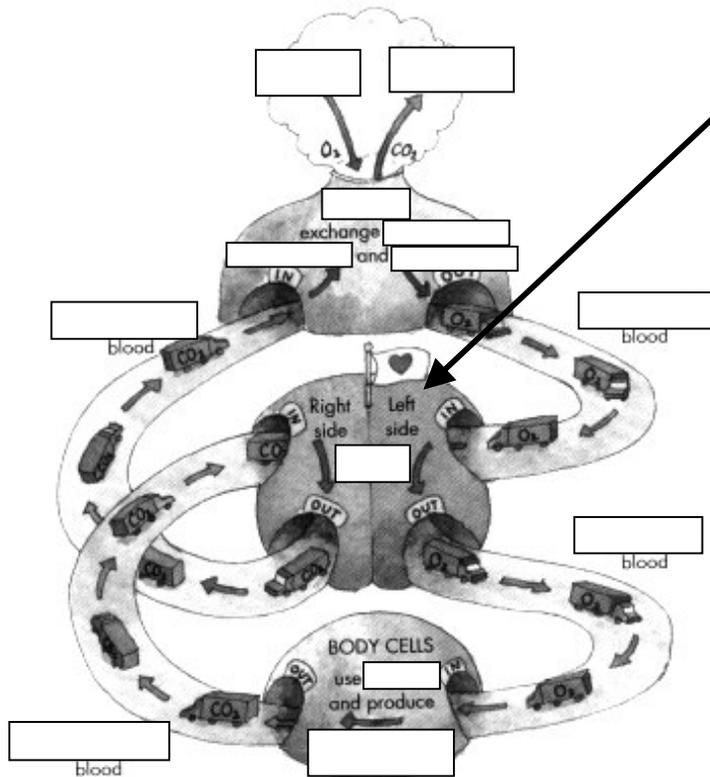
**One-way  
valve open**



**One-way  
valve closed**

46. After blood comes from the lungs, it is rich in the gas \_\_\_\_\_ and is called \_\_\_\_\_ blood.
47. Coming from the lungs, blood comes into the (*left/right*) \_\_\_\_\_ side of the heart. From here it is pumped into the large \_\_\_\_\_ that go to all the other parts of the body.
48. In the cells of your body, the blood loses \_\_\_\_\_ and becomes \_\_\_\_\_ **ated** blood.

49. Deoxygenated blood from your body cells moves through vessels called \_\_\_\_\_ back to the (left/right) \_\_\_\_\_ side of the heart. From here, it is pumped to the \_\_\_\_\_, where it picks up oxygen, and again becomes **oxygenated** blood. Blood from the lungs goes back to the (left/right) \_\_\_\_\_ side of the heart, and the cycle starts over.
50. The right side of the heart pumps blood to the (lungs/rest of the body) \_\_\_\_\_  
 \_\_\_\_\_ The left side of the heart pumps blood to the (lungs/rest of the body) \_\_\_\_\_
51. Which do you think needs to have stronger muscles, the left side of the heart or the right side of the heart? \_\_\_\_\_ Explain your answer  
 \_\_\_\_\_
52. Fill in the blanks in the following diagram of the circulatory system:



Explain why the “left side” is shown on the **right** side of the diagram!

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

53. Your circulatory system transports \_\_\_\_\_ energy throughout your body.
54. Why does warming up your feet or hands seem to make your whole body feel warmer? \_\_\_\_\_  
\_\_\_\_\_
55. The heat energy that gets into the bloodstream comes from the process of \_\_\_\_\_ in your body cells.
56. When the capillaries in a certain area of the body receive a higher volume of blood, the area gets (*warmer/cooler*) \_\_\_\_\_
57. Your body gets rid of excess heat by warming the skin so that the heat can escape into the surroundings. What is another body process that helps get rid of excess heat? \_\_\_\_\_
58. When the body gets very cold, the capillaries near the outside of the body, especially in the fingers, toes etc. constrict (get smaller) while the blood flow to the inner organs remains at a high volume. Suggest a reason why the body would do this when it gets very cold. \_\_\_\_\_  
\_\_\_\_\_
59. What happens when a person is suffering from **hypothermia**? \_\_\_\_\_  
\_\_\_\_\_