

The Body's Transportation System

Guide for Reading

- ◆ What is the function of the cardiovascular system?
- ◆ What role does the heart play in the cardiovascular system?
- ◆ What path does blood take through the circulatory system?

The **cardiovascular system**, or circulatory system, consists of the heart, blood vessels, and blood. **The cardiovascular system carries needed substances to cells and carries waste products away from cells.** Blood carries needed oxygen to cells and carries waste products away from cells.

The **heart** is a muscular organ that pumps blood throughout the body. **Each time the heart beats, it pushes blood through the blood vessels of the cardiovascular system.**

The heart has a right side and a left side. Each side has two compartments, or chambers. Each upper chamber, or **atrium**, receives blood that comes into the heart. Each lower chamber, or **ventricle**, pumps blood out of the heart. In each side of the heart, the atrium and ventricle are separated by a valve. A **valve** is a flap of tissue that prevents blood from flowing backward.

The **pacemaker** in the right atrium sends out signals that make the heart muscle contract. The pacemaker adjusts the heart rate according to the body's oxygen needs. When the body needs more oxygen, the heart beats faster.

After leaving the heart, blood travels through three kinds of blood vessels. **Arteries** carry blood away from the heart and into the capillaries. **Capillaries** are tiny vessels where substances are exchanged between the blood and body cells. Blood flows from capillaries into veins. The **veins** carry blood back to the heart.

The overall pattern of the body's blood flow consists of two loops. **In the first loop, blood travels from the heart to the lungs and then back to the heart. In the second loop, blood is pumped from the heart through the body and then returns again to the heart.** In the first loop, oxygen-poor blood is pumped by the right ventricle to the lungs, where it picks up oxygen. Blood is then carried back to the left atrium. In the other loop, the oxygen-rich blood moves from the left atrium to the left ventricle. The left ventricle pumps the oxygen-rich blood to the rest of the body. Blood leaves the left ventricle through the **aorta**, the largest artery in the body. After the blood has traveled through the body, oxygen-poor blood comes back to the right atrium of the heart.

When the ventricle muscles contract, they exert a force on the blood that is inside them. A **force** is a push or pull.

SECTION 17-1

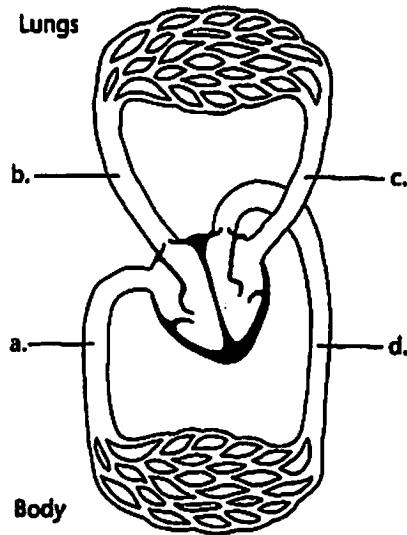
REVIEW AND REINFORCE

The Body's Transportation System

◆ Understanding Main Ideas

Use the diagram to answer the following questions on a separate sheet of paper.

1. Draw arrows on the diagram to show the path of the blood flow throughout the body.
2. What is the function of the atria? What is the function of the ventricles?
3. Which of the large blood vessels labeled *a*, *b*, *c*, and *d* are arteries and which are veins? Explain how you know.



◆ Building Vocabulary

From the list below, choose the term that best completes each sentence.

aorta capillaries cardiovascular system force
heart pacemaker valve

4. The _____ is a group of cells that adjusts the heart rate.
5. The muscular organ that pumps blood through the body is called the _____.
6. The _____ is made up of the heart, blood vessels, and blood.
7. A(n) _____ is a flap of tissue that prevents blood from flowing backward.
8. The largest artery is called the _____.
9. Substances are exchanged between the blood and body cells in the _____.