

SECTION SUMMARY

The Respiratory System

Guide for Reading

- ◆ What are the functions of the respiratory system?
- ◆ What structures does air pass through as it travels to the lungs?
- ◆ How do oxygen, carbon dioxide, and water move in the lungs?

The respiratory system moves oxygen from the outside environment into the body. It also removes carbon dioxide and water from the body. **Respiration** is the process in which oxygen and glucose undergo a complex series of chemical reactions inside cells. These chemical reactions release energy for the body. Respiration also produces carbon dioxide and water. Respiration is different from breathing, which is the movement of air into and out of the lungs.

As air travels from the outside environment to the lungs, it passes through the following organs: nose, pharynx, trachea, and bronchi. Air enters the body through your nostrils. The inside of the nose is coated with mucus. Mucus cleans, warms, and moistens air you breathe. The inside of the nose is lined with cilia. **Cilia** are tiny hairlike extensions that can move together. They sweep the mucus into the throat where it is swallowed.

Air moves from the nose downward into the top of throat, or **pharynx**. The **trachea**, or windpipe, leads from the pharynx to the lungs. The walls of the trachea are made of rings of cartilage to keep it from collapsing. The trachea is lined with cilia and mucus. The cilia in the trachea move the mucus toward the pharynx.

Air moves from the trachea into the right and left **bronchi** (singular *bronchus*). The bronchi are passages that direct air into the lungs. The **lungs** are the main organs of the respiratory system. Inside the lungs, each bronchus divides into smaller and smaller tubes. At the end of the smallest tubes are bunches of alveoli (singular *alveolus*). **Alveoli** are tiny sacs of lung tissue specialized for the movement of gases between air and blood. Alveoli are surrounded by capillaries. **After air enters an alveolus, oxygen passes through the wall of the alveolus and then through the capillary wall into the blood. Carbon dioxide and water pass from the blood into the alveoli.** This process is known as gas exchange.

The **diaphragm** is a large, dome-shaped muscle at the base of the lungs. The diaphragm and rib muscles make the chest cavity expand when you inhale and contract when you exhale.

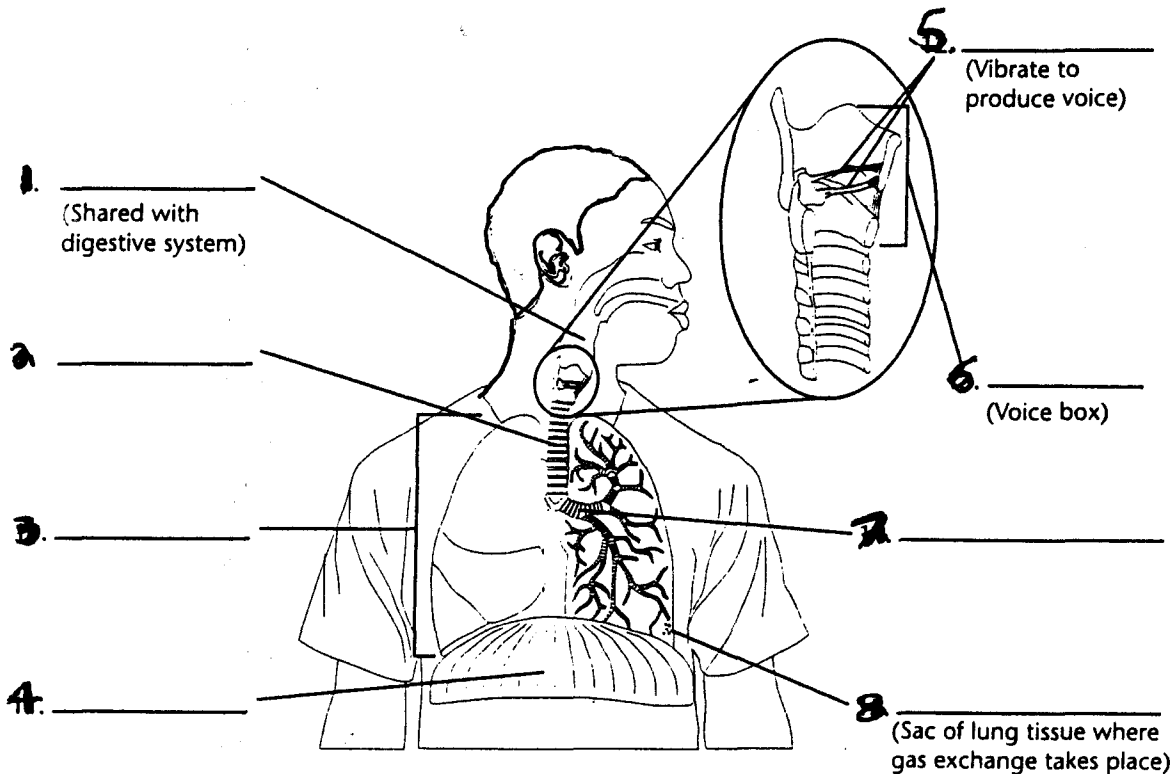
The **larynx**, or voice box, is located at the top of the trachea. Your **vocal cords** are two folds of connective tissue that stretch across the opening of the larynx. The vocal chords vibrate when air passes over them. This produces the sound of your voice.

Chapter

REINFORCEMENT

• The Respiratory System

Label the parts of the respiratory system shown in the diagram below.



In the space provided below, write the name of the structure indicated.

- _____ 1. warms and moistens air; filters dust particles
- _____ 2. transports air to the lungs
- _____ 3. prevents food from entering the trachea
- _____ 4. oxygen passes into the capillaries
- _____ 5. organs made up of masses of alveoli
- _____ 6. a sheet of muscle across the bottom of the chest cavity
- _____ 7. a division of the trachea

Label each statement below as a description of either inhalation or exhalation. Write the word inhale or exhale in the space provided below.

- _____ 8. The diaphragm contracts and moves downward.
- _____ 9. Air pressure in the chest cavity increases.
- _____ 10. The gases inside the lungs are pushed out through air passages.
- _____ 11. Air pressure in the chest cavity decreases.
- _____ 12. The volume of the chest cavity increases.