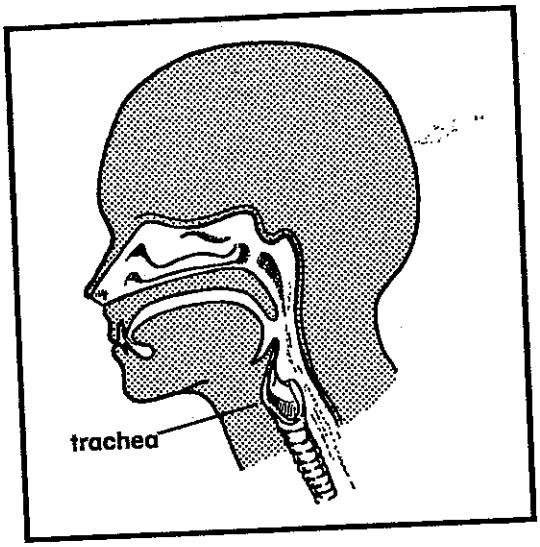
LESSON 4 HOW YOU BREATHE

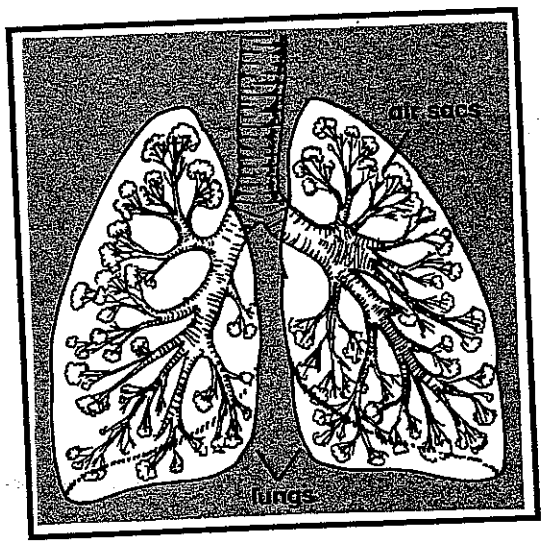


Your Respiratory System Helps You Breathe

Breathing is necessary to stay alive. Breathing brings in new oxygen and removes carbon dioxide. The **respiratory system** is all the body parts that help you breathe.

When you breathe, air enters your nose. Sticky mucus and tiny hairs clean the air by trapping small particles. Your nose also warms and moistens the air. From the nose, the air passes down your throat through a soft tube called the **trachea** that takes it to your lungs.

■ How does your nose clean the air you breathe?



Gases Move In and Out of the Lungs

Air from the trachea passes through smaller and smaller tubes inside the lungs until it reaches the **air sacs.** Air sacs are tiny places in the lungs that exchange oxygen and carbon dioxide with the capillaries. Each air sac is surrounded by capillaries.

Oxygen moves from the air sacs into the capillaries. Carbon dioxide moves from the capillaries into the air sacs. The blood in the capillaries carries the oxygen to all of the cells. The carbon dioxide leaves your body when you breathe out.

■ What gases move between air sacs and capillaries?

Your Muscles Help You Breathe

The pictures show a man breathing in and out. When you breathe in, the muscles between your ribs contract and pull your rib cage up and out. At the same time, your **diaphragm** contracts and moves down. The diaphragm is a large muscle below the lungs. The movements of the diaphragm and the rib cage make more space inside your lungs. The outside air rushes into the lungs to fill the space.

When you breathe out, the opposite happens. Your rib muscles relax and the rib cage moves down and in. Your diaphragm relaxes and moves up. The space inside your lungs becomes smaller. As a result, the air inside your lungs is squeezed out.

■ What muscles help move air into and out of the lungs?

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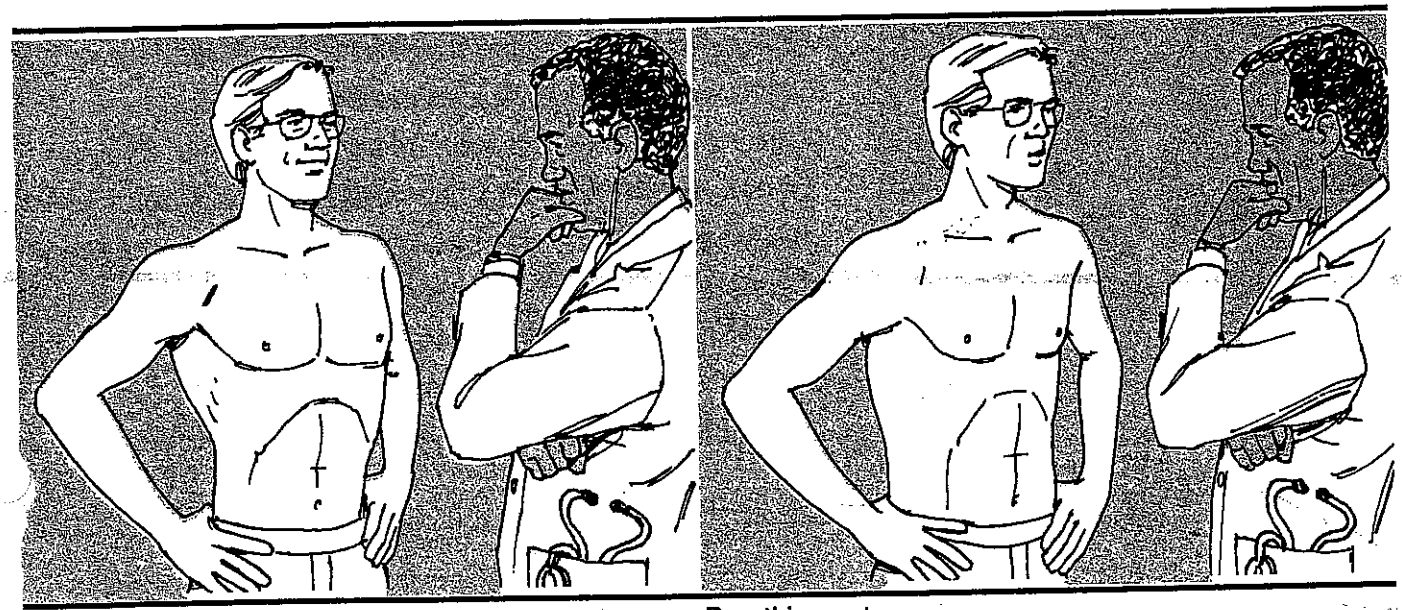


Breathing in

Breathing out

The Lungs Remove Wastes

Your kidneys do not remove carbon dioxide from your blood. Your lungs remove carbon dioxide and some water. In the picture, you can see the water vapor in the girl's breath. The water vapor coming from her mouth contains both water and carbon dioxide.

Blood carries carbon dioxide and water to the capillaries in your lungs. Oxygen from the air sacs moves into the capillaries. Carbon dioxide and water move into the air sacs. When you breathe out, the carbon dioxide and water leave your body.

■ What wastes are removed by the lungs?

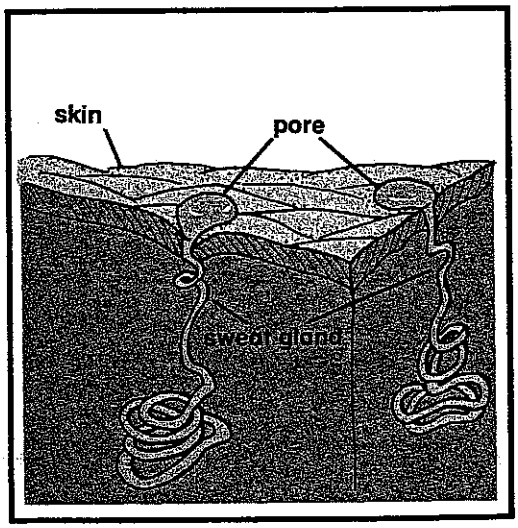
In cold weather, you can see the water vapor in your breath.

The Skin Removes Wastes

The picture shows the **sweat glands** that are below the surface of your skin. Sweat glands are tiny, coiled tubes that remove water, salt, and chemical wastes from blood vessels in the skin. The wastes form sweat. Sweat glands make sweat all of the time, even when you are at rest.

Sweat moves up the sweat glands to openings in the skin called pores. The water in sweat **evaporates**, or becomes moisture in the air. The solid wastes are left on the skin. When you wash, you remove these wastes.

■ How does the skin remove wastes?



The sweat glands in your skin help remove wastes from your blood vessels.