

Oxygen for Life

What do an elephant's trunk and a dolphin's blowhole have in common? You might have guessed—they help the animals breathe. These parts help bring oxygen into the animals' bodies and send carbon dioxide out of their bodies. The elephant's trunk and the dolphin's blowhole are parts of the animals' **respiratory systems**.



Every animal needs a way to take in oxygen.

Although you don't have a trunk or a blowhole (and you'd look pretty funny if you did!), your nose and mouth do a similar job. Animals may look different, but we all have ways of bringing oxygen into our bodies. All animals need oxygen to live.

Cells need oxygen to make energy from food. After oxygen enters the body, the circulatory system delivers the oxygen to the cells. The *circulatory system* also brings nutrients from food to the cells. This system delivers needed materials to cells and also removes wastes.

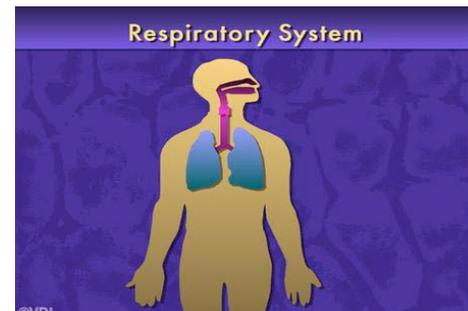
Let's take a look at how these systems work together.

Respiration and Circulation

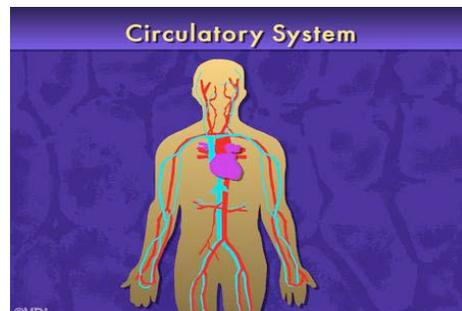
Your respiratory system brings oxygen into your body when you breathe. Your circulatory system sends the oxygen to your cells through your **blood**. After cells use the oxygen, these systems work together to send wastes out of your body.

Your respiratory system is made up of airways, lungs, and muscles that help you breathe. When you breathe in, air fills millions of tiny air sacs in your lungs. These air sacs are called *alveoli*. Each sac is surrounded by thin **blood vessels** called *capillaries*.

Your heart, blood, and blood vessels are all part of your circulatory system. Capillaries are the tiniest blood vessels. Capillary walls are so thin that oxygen, nutrients, and wastes can pass through them. Materials can move into and out of blood in capillaries.



The respiratory system brings oxygen into the body and sends carbon dioxide out.



The circulatory system delivers oxygen to cells and takes carbon dioxide away.

Oxygen and Carbon Dioxide

When you breathe air into your lungs, oxygen flows into capillaries. The blood moves to your heart through blood vessels. Then your heart pumps the oxygen-rich blood through vessels to your cells.

As the blood nears cells, it enters capillaries again. Oxygen moves out of the capillaries and into the cells. Cells send carbon dioxide and other wastes through the capillaries into the blood to be carried away.

Next, blood flows back toward your heart to be pumped to the lungs. Carbon dioxide flows through capillaries into the lungs. Now the carbon dioxide can flow out of your body. The blood picks up more oxygen at the lungs, and the cycle begins again!

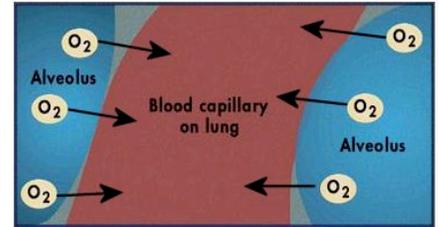
Systems Working Together

Have you ever noticed that you breathe faster when you exercise? Your heart beats more quickly, too. When you exercise, your muscle cells need plenty of energy. So you breathe faster to bring more oxygen inside your body.

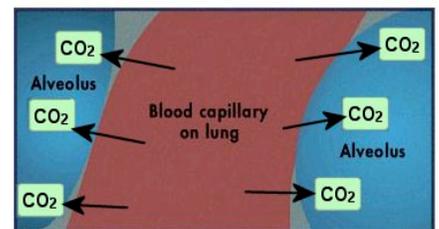
Your heart rate quickens to send this oxygen to your muscles. The cells are rapidly making wastes, which must be removed, too. When you exercise, you can observe your systems working together to give your cells what they need.

With every beat of your heart and every breath you take, your systems work together to keep you alive!

Breathing in OXYGEN



Breathing out CARBON DIOXIDE



When you breathe in, oxygen from the alveoli flows into capillaries.



When you exercise, your circulatory and respiratory systems help you get energy more quickly.