

Who "Nose" What the Parts of This System Are?

Think about standing in the kitchen. A loaf of bread is in the oven. It smells great. You close your eyes and take a deep breath. Mmm, you can hardly wait until the bread is done and you can eat a piece of it.

The Nose

When you smell the bread, you use your nose. You also use your nose for breathing. That is one of the ways you get oxygen into your body. (Sometimes you breathe through your mouth. This is the other way to get oxygen into your body.) Your nose, or your **nasal cavity**, is the first part of your respiratory system.

Let's take a closer look at your nose. Your nose is stuck in the middle of your face. It has two holes that lead into your head. These holes are called the **nostrils**. Inside your nostrils you have lots of tiny blood vessels. They are very close to the surface. You also have some tiny hairs that are called **cilia**. Finally, you have a moist, sticky fluid in your nose, called mucus.

Why does your nose need to have blood vessels, mucus, and cilia? They each have very important jobs to do. Remember you are bringing air from the environment into your body. Sometimes that air is dirty or the air may carry some kind of disease. You do not want the dirt or disease to get inside your body and spread to other parts of the body. The mucus and cilia are your first protectors. They have the task of making sure the air that goes into the rest of your body is as clean as possible. The sticky mucus traps some of the dust and dirt. The cilia trap more dust and dirt. They also move the dirt and dust out of your respiratory system, in a sneeze or a cough.

Sometimes the air that you are breathing is very cold. The inside of your body is nice and warm, so the air going into it needs to be as warm as possible. The blood vessels inside your nose are very close to the surface, and they are very small. The warm blood moving inside the blood vessels helps heat up the air that you are breathing.

The three jobs of the cilia, mucus, and blood vessels are to moisten, to warm, and to filter the air that you breathe.

The Pharynx

The next part of your respiratory system is called the **pharynx**. Another name for this is the throat. It is a muscular tube that is about five inches long. The pharynx connects the nasal cavity with the trachea. The pharynx is lined with cilia that trap any dirt that may have gotten past the filtering system in the nasal cavity.

The Trachea

The third part of your respiratory system is called the **trachea**. A more common name is the windpipe. As the common name suggests, this is a pipe or tube. It is about 12 inches long. Since you need oxygen all the time, this tube needs to remain open. The trachea is made of smooth muscle (remember that this is involuntary muscle) and is held open by rings of cartilage. The cartilage rings are "C" shaped and most people have between 16 and 20 of them.

If you tilt your head back and gently run your fingers over the outside of your throat, you should be able to feel the cartilage rings in your trachea. Now, if you hold your head up straight, you can gently move the trachea from side to side. You should still be able to feel the cartilage.

The Larynx

At the top of your trachea, you have a very important structure. The **larynx**, or voice box, is a series of folds of tissue surrounded by protective cartilage. When air passes over the folds of tissue, or **vocal cords**, sounds are made. You learn to control the amount of air passing through your larynx. If you want to talk in just a whisper, you need to use just a bit of air. If you want to yell loud enough to be heard across the school yard, you have to use a lot of air. That's why you seem to be out of breath after you have been screaming for a while.

The Epiglottis

When we talked about the digestive system, we said that you have a tube right next to your trachea that is called the esophagus. This tube carries food from your mouth to your stomach. It lies flat when you are not using it and opens up when you swallow. The trachea needs to remain open all the time so air can move from your nasal cavity to your lungs. With the two tubes being so close to each other, you might think it would be easy for food to get headed down the wrong tube.

Your body has a wonderful way of protecting you. At the end of the pharynx, which is also the beginning of the trachea, you have a flap of muscle called the **epiglottis**. When you are breathing, the epiglottis stays out of the way, letting air flow freely into your open trachea. When you swallow, the epiglottis moves to cover your larynx and the opening to your trachea. When the epiglottis moves, it opens up the way for food to move down the esophagus to your stomach. As soon as you have finished swallowing, the epiglottis moves back out of the way, and you are ready to breathe freely.

The Bronchi

At the base of your trachea, your respiratory system splits into two parts. Each part is a tube, called a bronchus. The **bronchi** (plural for bronchus), which lead into the right and left lungs, are made of involuntary muscle and they have rings of cartilage, similar to the trachea. The bronchi, however, are smaller. These tubes continue to clean and moisten the air that you breathe in with the mucus that lines them.

The Bronchioles and Alveoli

In the lungs, the bronchi become smaller and smaller. These tiny tubes are called **bronchioles**. The smallest bronchioles are surrounded by tiny clusters of air sacs. They almost look like bunches of grapes surrounding tiny branches on an upside down tree! The air sacs are called **alveoli**. Scientists believe there are about 300 million alveoli in each lung! The air sacs are able to expand and contract. When they are filled with air, they resemble tiny balloons. When the air is exhaled out of your lungs, the air sacs deflate like empty balloons, ready to take in new air with the next breath.

Each alveolus (singular for alveoli) in your lungs is surrounded by tiny blood vessels. Oxygen brought into your lungs through the respiratory system is able to pass through the walls of the alveolus and into the blood capillary. In a similar way, waste gases carried to the lungs by the circulatory system are able to pass from the capillaries to the alveoli so they can be removed from the body.

More About Your Lungs

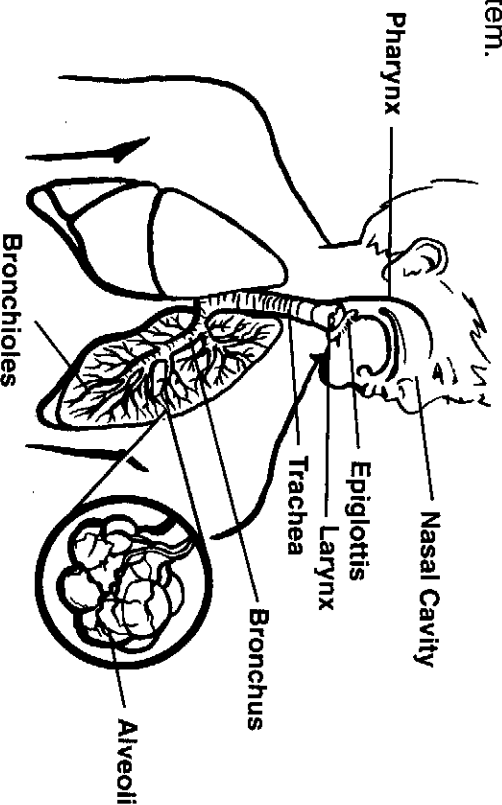
Together, the bronchioles and the alveoli make up your **lungs**. Your two lungs are cone-shaped organs made of spongy tissue. They are elastic in nature, being able to stretch larger when you inhale and return to smaller size when you exhale. The left lung is slightly smaller than the right lung because it needs to leave extra room for the tip of the heart!

If you were to spread a pair of lungs out flat, they would cover a huge area. If you were to spread out the entire skin of an average human, the lungs would be more than 20 times bigger than the skin. Remember, you must have oxygen to stay alive. It is needed by all the cells in your body and you do not have any way to store oxygen for later use. The large surface area of your lungs allows you to absorb a great deal of oxygen each time you breathe.

The Diaphragm

The final part of your respiratory system is a large sheet of muscle called the **diaphragm**. This muscle separates your chest from the lower part of your body. The diaphragm lies just under your ribs and looks like a small dome. When you inhale, the diaphragm contracts and moves down. When you exhale, the diaphragm relaxes and moves back up to its resting position.

Wow, that's a lot of information to learn. Try to remember that the respiratory system begins with the nasal cavity. Air leaving the nasal cavity travels through the pharynx, trachea, larynx, bronchi, bronchioles, and alveoli. The oxygen then moves into the blood and the first job of the respiratory system is done. Waste gases move from the blood into the alveoli. The wastes then travel through the bronchioles, bronchi, trachea, larynx, pharynx and leave your body through your mouth or nose. That completes the second job of the respiratory system.



Name: _____ Date: _____

Questions

1. What is the more common name for each of these parts of the respiratory system?
 - a. Alveoli _____
 - b. Nasal Cavity _____
 - c. Cilia _____
 - d. Pharynx _____
 - e. Larynx _____
 - f. Trachea _____
2. What are the three jobs done by the blood vessels, cilia, and mucus in your nasal cavity?

3. Why is it better to breathe in through your nose instead of breathing in through your mouth?

4. Why does the pharynx need to have cilia?

5. Why does your trachea need to have cartilage rings?

6. Suppose you want to whisper to the student next to you in class, what must you remember to do with your vocal cords?

7. Why do you need two bronchi?

8. What do the lungs look like? (You may draw a picture.)

9. How can the oxygen you bring into your body get into the circulatory system?

10. What position must the diaphragm be in when you inhale? When you exhale?

