

Human Body

Grades 2-5

Activities

Printables

# RESPIRATORY SYSTEM

By Heart2HeartTeaching.com



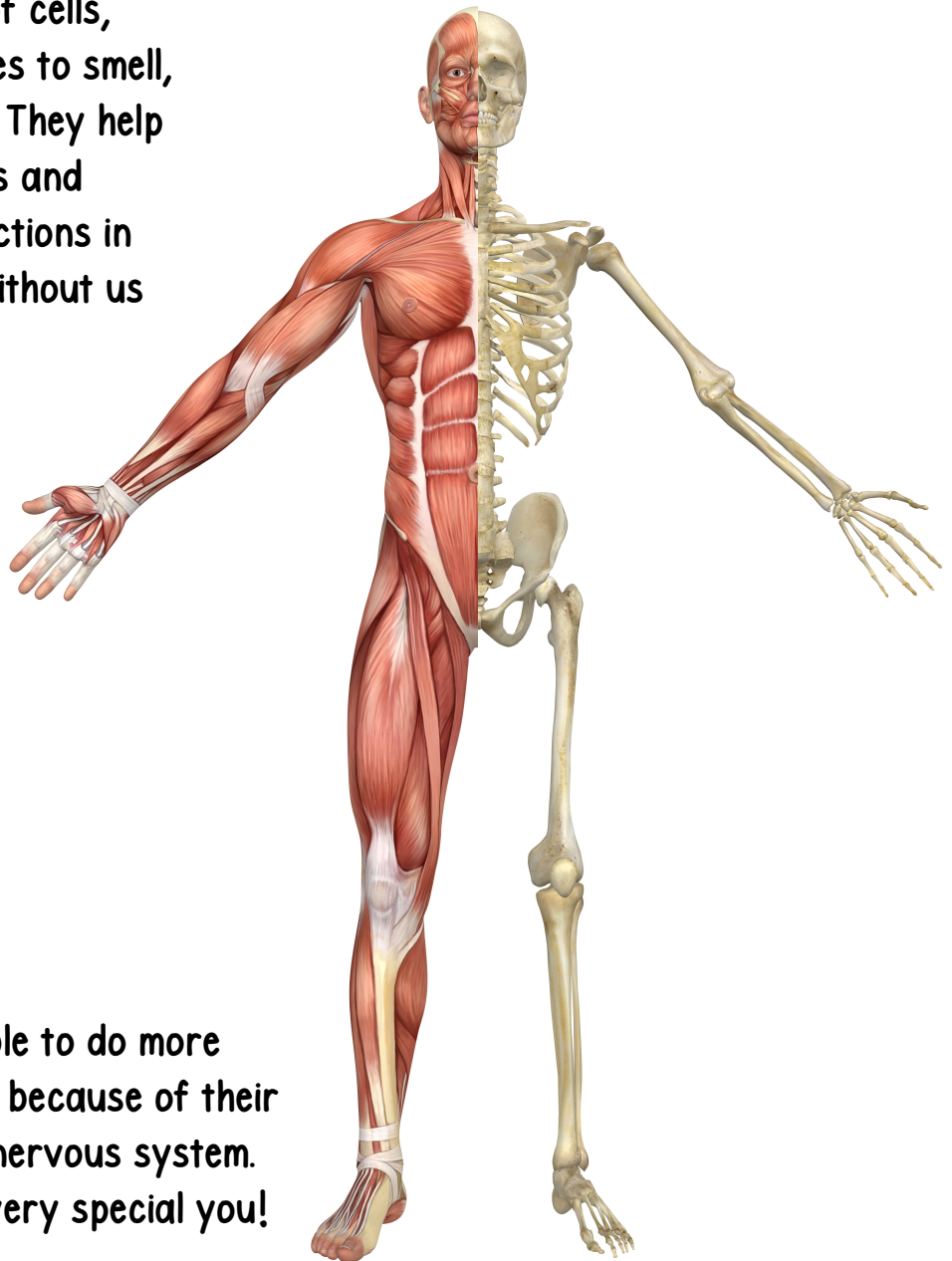
# Our Amazing Bodies

The human body works in amazing ways. Everything you do, feel, learn, and remember throughout your life is made possible because of the incredible machine that is your body. Our bodies are made up of trillions of cells. These cells all work together in a giant network deep inside our bodies. They send messages back and forth throughout our body. They give us the ability to crawl, run, and kick a ball. They allow you to learn to read a book and write your name. They cause you to feel happy, lonely, and excited.

Because of these clusters of cells, you can use your five senses to smell, taste, touch, see, and hear. They help you remember funny stories and special memories. Many functions in our bodies are controlled without us even thinking about them.

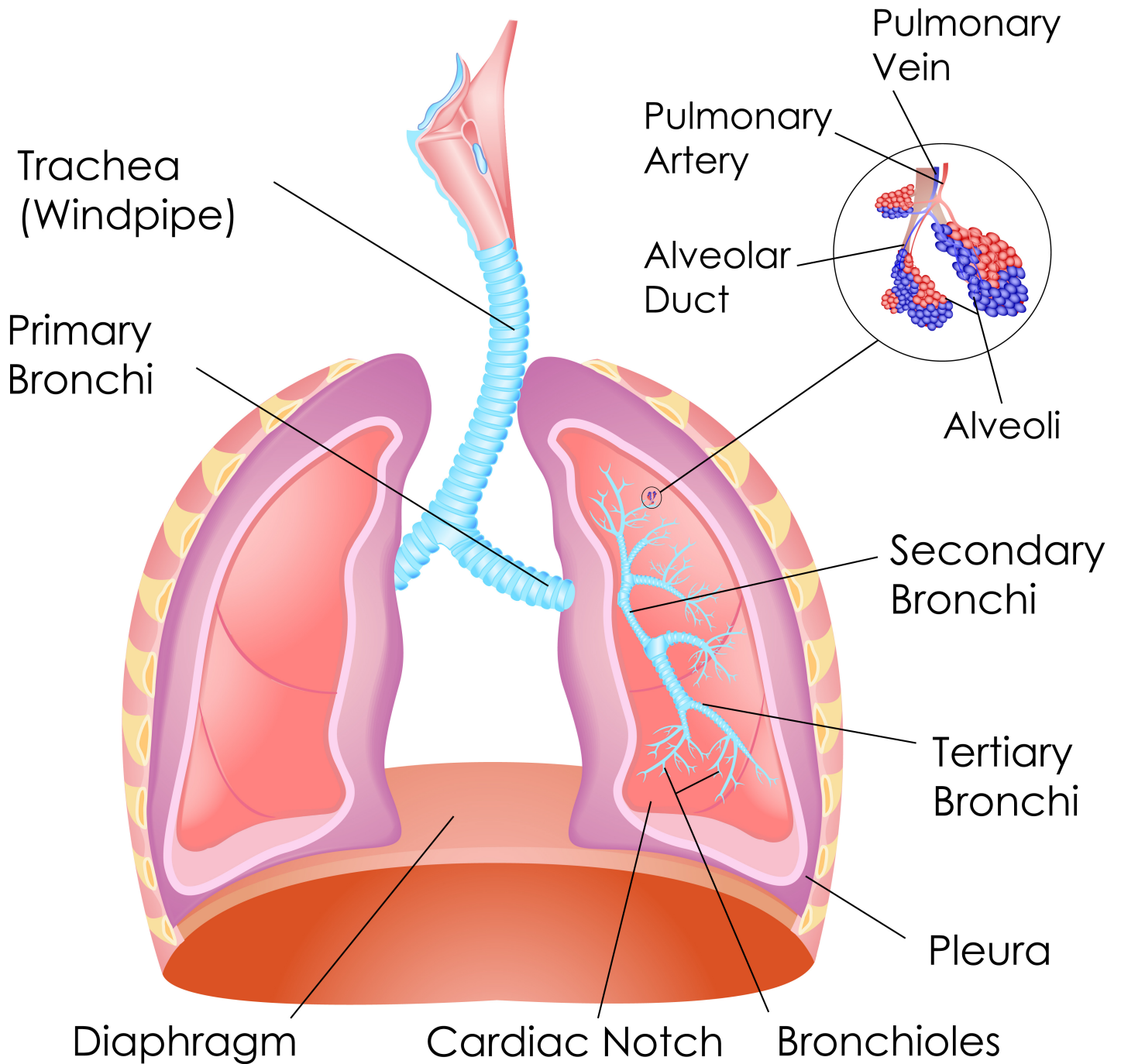
Did you know that your heart is constantly beating all the time, day and night, totaling about 5,000 beats an hour? Take a guess at how many breaths you take everyday? The average person takes about 23,000 breaths a day. Our bodies are always working to keep us alive and healthy.

Humans are smarter and able to do more than any other living animal because of their highly developed brain and nervous system. That is what makes you, a very special you!



Name: \_\_\_\_\_

# RESPIRATORY SYSTEM



Biology

Lungs

# WHAT IS RESPIRATION?

Humans need oxygen to stay alive. When we breathe in, we are taking oxygen into our bodies. When we breathe out, we exhale carbon dioxide. Carbon dioxide is the most important gas for a plant. Plants need carbon dioxide for life. In return, plants give off oxygen that we need to survive.



# The Respiratory System

Air all around us is a mixture of gases. About 20% of the air is made up of oxygen. Humans need oxygen to stay alive. In fact, every cell in our body uses oxygen and food to make energy and keep us alive. Our respiratory system is made up of many different organs and parts that work together so we can breathe.

Most of the time we breathe without thinking about it. We breathe all the time, day and night. We breathe when we are playing outside, reading a book, and sleeping. Each day we take more than 20,000 breaths. We never have to think about it. It is so important that it just happens automatically.

When you inhale or breathe in it is called inspiration. When you exhale, or breathe out it is called expiration. When we put an inspiration and expiration together, it is called a respiration.

When we breathe in, we are taking oxygen into our bodies. When we breathe out, we exhale carbon dioxide. Carbon dioxide is the most important gas for a plant. Plants need carbon dioxide for life. In return, plants give off oxygen that we need to survive.

What does the word respiration mean?

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How do people and plants depend on each other?

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# The Parts of the Respiratory System

## The nose

Air breathed in through your nose is warmed up and moistened. Plus tiny hairs in the nose called cilia trap dirt and dust from the air, just like a filter. That is why it is healthier for you to breathe in through your nose instead of your mouth.

## The Epiglottis

In your throat, there are two tubes. One is the trachea, or windpipe, that carries air from your nose to your lungs. Another tube behind it is called the esophagus that carries food to your stomach. At the back of your throat is a special flap called the epiglottis. It closes over the trachea when food is swallowed to protect you from getting food into your windpipe.

You might have heard someone say that "it went down the wrong pipe". That can happen when the epiglottis didn't close quickly enough. Even the smallest piece of food can cause you to cough. Coughing helps to bring the food back up to the throat, so it doesn't block the windpipe.

## The Trachea

The trachea is lined with cells that make a sticky liquid called mucus. This mucus catches any dust and bacteria when you breathe in. Teeny tiny hairs line the trachea also. They carry the dust that gets trapped in the mucus back to the throat. They work in a wave-like fashion much like grass blowing in the wind.

At the top of the trachea is the larynx, or voice box. Stretched across the voice box are tiny ridges called vocal cords, which open and close to make sounds. Air passing over these vocal cords produces sound. If you gently place your hand over the front of your neck and hum, you can feel the vibration of your vocal cords. The harder we breathe out, the louder the sound it makes.

What does the epiglottis do?



A doctor uses a stethoscope to listen to your lungs as you breathe in and out.

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# Your Lungs Are Amazing!

Your lungs are an amazing part of the respiratory system that allow you to take in oxygen from the air, get rid of carbon dioxide, and even sing, shout, and talk.

You have two lungs that are located in your chest. The lungs fill up that space almost entirely. The lung on the left side of your body is a smaller than the lung on the right side. Why is the left lung slightly smaller? This tiny bit of extra space leaves room for your heart.

Your rib cage protects your lungs from injury. They are made up of 12 pairs of ribs that completely frame your lungs to keep them safe.

Breathing is controlled by the muscles of the rib cage and the diaphragm. The muscles of the rib cage are called the intercostal muscles. The diaphragm located right beneath the lungs is a muscle that works together with your intercostal muscles to inhale and exhale air.

When you cough or blow up a balloon, you are using the intercostal muscles to push the air out with greater force.

To feel your lungs in action let's try an experiment. Place both hands on your chest and breathe in very deeply and hold it. Did you feel your chest rise and get bigger? Now exhale to let the air out, and feel your chest fall. Your lungs are very powerful organs that keep you alive.



Why is the lung on the left side smaller than the one on the right side?

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Name: \_\_\_\_\_

# Respiratory System

In 3 steps explain the process of respiration:

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\_\_\_\_\_

\_\_\_\_\_

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\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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\_\_\_\_\_

\_\_\_\_\_

Name a part of the respiratory system and tell what it does:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Think of a word that describes respiration to add beside each letter:

**B R E A T H**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Name 3 things you can do to keep your lungs healthy:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Explain how oxygen is transported through your body:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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Name: \_\_\_\_\_ How it Works

1. Respiration starts in the...

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4. What do your lungs do?

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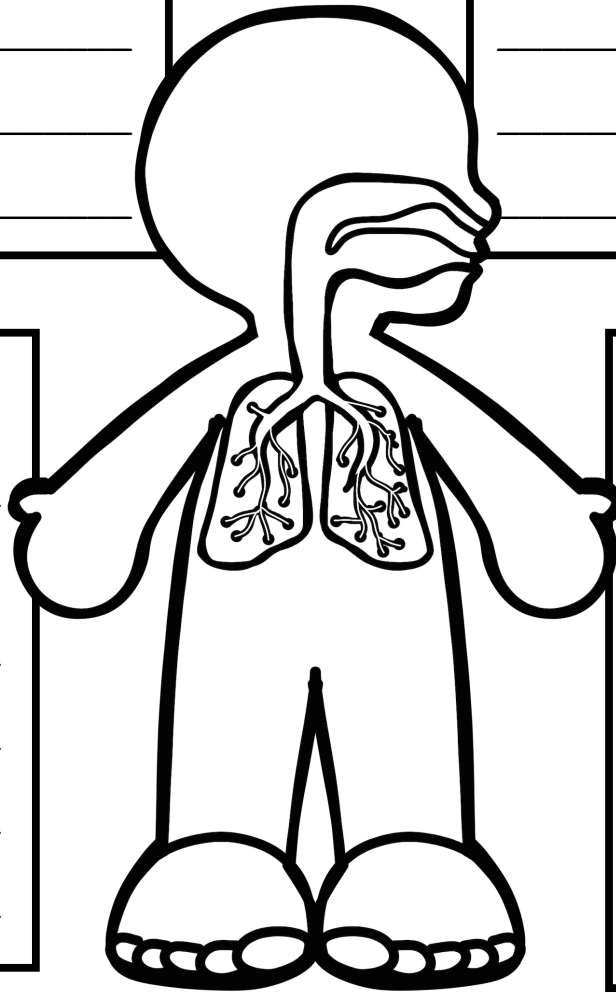
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2. Cilia are \_\_\_\_\_

that help to...

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5. At the end of each bronchiole is a tiny sac called a alveoli. Its main job is to...

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3. The trachea is a...

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6. The heart has the big job of...

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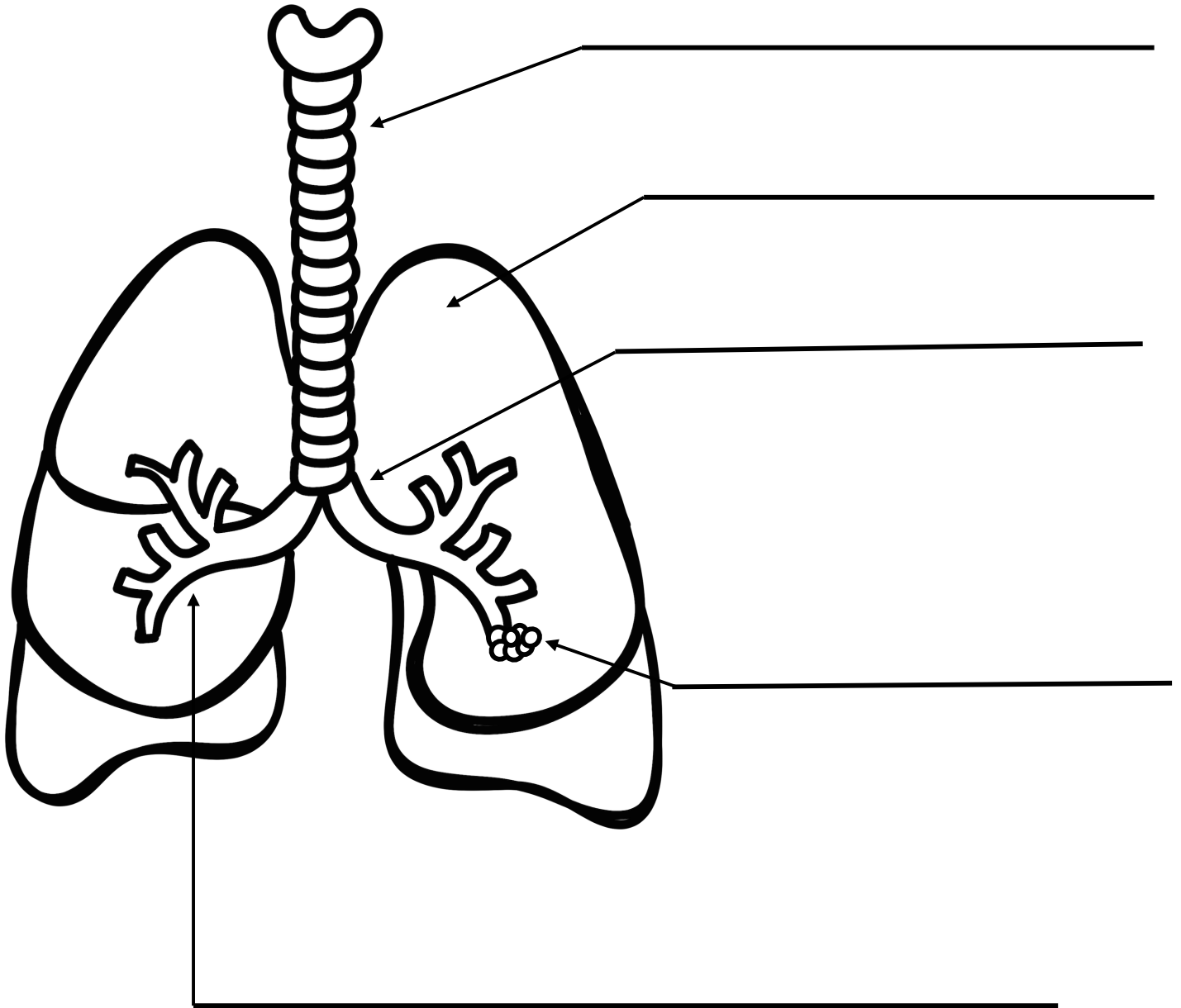
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Name: \_\_\_\_\_ Label the Diagram

## Can You Name the Parts of the Respiratory System?



What happens inside the alveoli?

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Name: \_\_\_\_\_ Respiratory System

Humans need \_\_\_\_\_ to stay alive. In fact, every cell in our body uses oxygen and food to make \_\_\_\_\_ and keep us alive. Our respiratory system is made up of many different \_\_\_\_\_ and parts that work together so we can breathe.

When you inhale or breathe in it is called \_\_\_\_\_.

When you \_\_\_\_\_ or breathe out it is called expiration.

When we put an inspiration and expiration together, it is called a

\_\_\_\_\_.

When we breathe in, we are taking oxygen into our \_\_\_\_\_.

When we breathe out, we exhale \_\_\_\_\_ dioxide. Carbon dioxide is the most important \_\_\_\_\_ for a \_\_\_\_\_.

Plants need carbon dioxide for life. In return, plants give off oxygen that we need to \_\_\_\_\_.

Your \_\_\_\_\_ are an amazing part of the \_\_\_\_\_ system that allow you to take in oxygen from the air, get rid of carbon dioxide, and even \_\_\_\_\_ and \_\_\_\_\_.

Word Bank:

inspiration

talk

plant

bodies

energy

organs

respiration

survive

lungs

oxygen

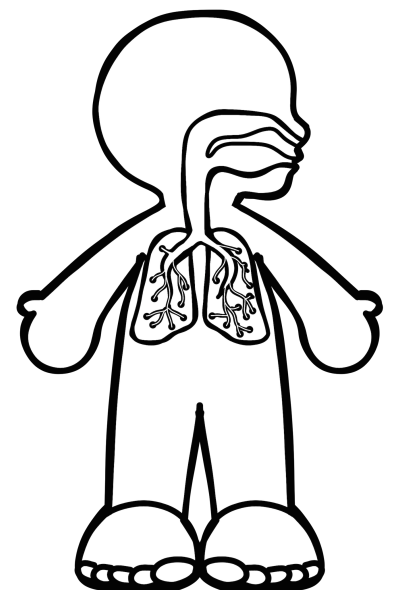
exhale

carbon

respiratory

gas

sing



# Breathing in Action

Your lungs are two large spongy organs. At the bottom of the trachea or windpipe, there are two large tubes called bronchi. One leads to the left lung and the other leads to the right lung.

Like the branches of a tree, the bronchial tubes divide into smaller and smaller tunnels. The tiniest branches are called bronchioles, and there are thousands of them in each lung.

At the end of each bronchiole is a tiny sac filled with air called alveoli. There are millions of alveoli in your lungs. The job of the alveoli is to put oxygen into the blood and take carbon dioxide out of the blood. Each one of the alveoli is surrounded with very small blood vessels called capillaries. These capillaries are so tiny that it is easy for oxygen to pass through them into the bloodstream. When you breathe in oxygen, it is stored for a short time in the alveoli. Then the oxygen passes into a capillary and enters a red blood cell. The red blood cells carry the oxygen to the heart and out to every part of the body. The heart has a big job of pumping the blood all over the body.

In the brain, there is an area called the respiratory center. It is always sending messages to your intercostal muscles so that you continue to breathe all the time. You can control your breathing but not for too long. Adults breathe about 12 to 20 times every minute.



Explain what happens inside the lungs:

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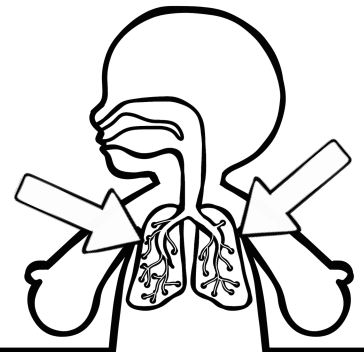
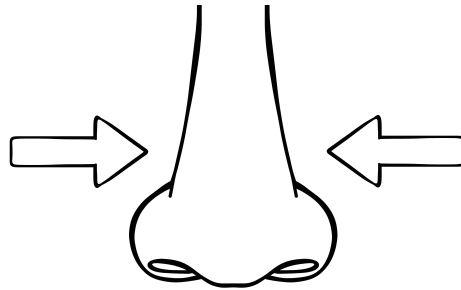
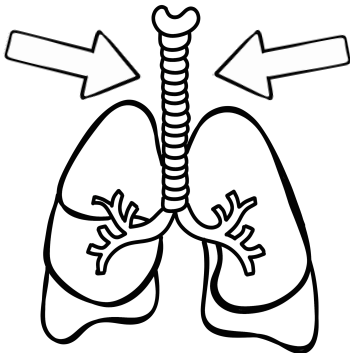
# No Carbon Dioxide Wanted!

Our cells use oxygen from the air while food is broken down during digestion. This process provides needed energy. As this occurs, the cells give off waste products. The main waste product is carbon dioxide. Our bodies cannot use carbon dioxide so it must get rid of it.

Carbon dioxide leaves a cell and passes through to a capillary. Blood in the capillary picks up the carbon dioxide and begins the trip back to the heart by way of the veins. The heart takes the blood filled with carbon dioxide and pumps it into the lungs.

In the lungs, carbon dioxide leaves the blood by passing through the wall of a capillary and into the alveoli. As we exhale or breathe out, we release carbon dioxide into the air. On the next breath, we grab a fresh supply of oxygen-rich air and the process starts all over again!

Who are the main helpers during respiration? Tell what each one does below.



**Trachea**

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**Nose**

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**Lungs**

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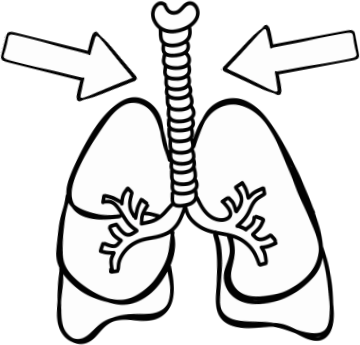
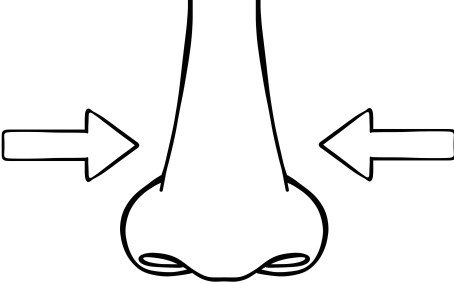
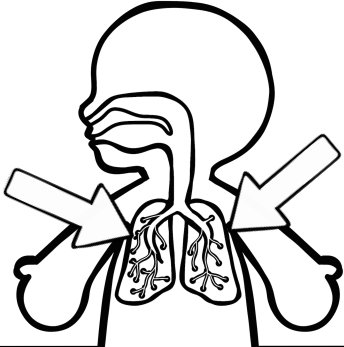
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Name: \_\_\_\_\_

## Helpers of Respiration

<b>Trachea</b> 	<b>Nose</b> 	<b>Lungs</b> 
Another name for it?	Another important job is?	How many do you have?

Directions: Glue or write the facts under the correct helper above.

As air is breathed in, it is warmed and moistened here.

This long tube is lined with sticky liquid called mucus.

The larynx or voice box is located at the top of this tube.

The tubes inside here branch out and look a lot like a tree.

Two large spongy organs that are located in the chest.

Tiny hairs called cilia trap dirt and dust from the air.

# Keeping Your Lungs Healthy

Smoking cigarettes can seriously damage the lungs and other parts of your body. When people smoke, the tiny hairs lining the trachea become damaged which allows dirt and dust into the lungs. Your alveoli get hurt because the chemicals in tobacco can cause the walls of the delicate alveoli to break down. This can make it much harder to breathe. Smoke can damage the cells of the lungs causing the healthy cells to be replaced by cancer cells. People who smoke tobacco are more likely to have colds and other infections. Cancer, heart disease, and emphysema are serious diseases that can be caused by smoking.

Love your lungs! Exercise is good for you, but especially for your lungs and heart. When you exercise, your lungs require more air to give your cells the extra oxygen they need. As you breathe deeper and take in more air, your lungs become stronger and better at supplying your body with the air it needs. Take good care of your lungs by exercising regularly and not smoking.



Explain what you can do to keep your lungs healthy:

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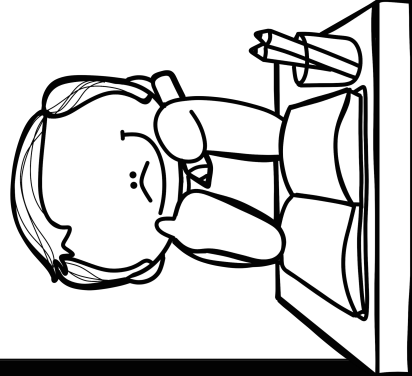
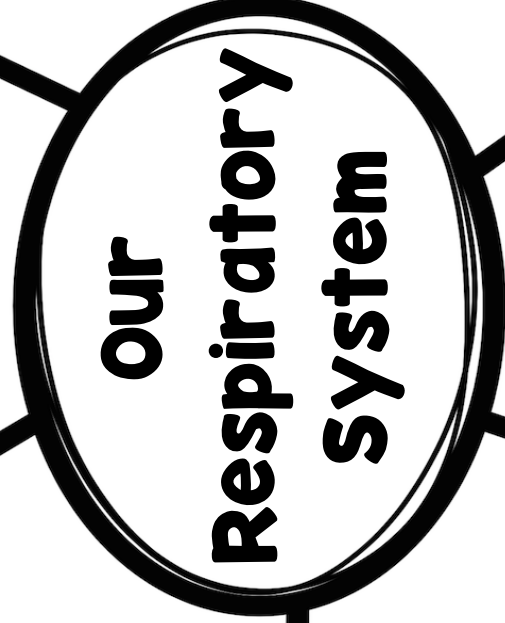
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Name: \_\_\_\_\_

Our Lungs are Amazing!

Directions: Tell six facts about our Respiratory System in the boxes shown below.



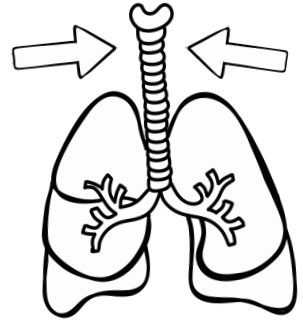


# Helpers of Respiration

Name: \_\_\_\_\_

**TRACHEA**

Description:



Main Job:

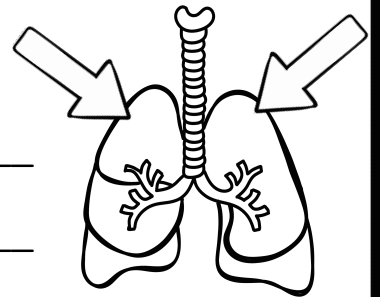
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**LUNGS**

Description:



Main Job:

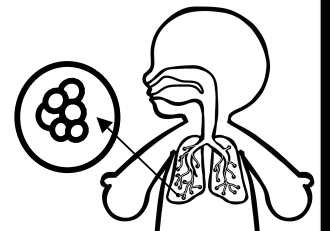
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**ALVEOLI**

Description:



Main Job:

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Name: \_\_\_\_\_ Respiratory System Questions

Directions: Read about the respiratory system and answer the questions below.

1. What is the main job of our respiratory system?

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2. What is the diaphragm?

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3. What happens in the lungs?

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4. Explain how our heart and lungs work together.

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5. What is a stethoscope?

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6. What gas is given off when we exhale? What gas do we breathe in?

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# Meet Elizabeth Blackwell

Elizabeth Blackwell was born in 1821 in the United Kingdom. When Elizabeth was young, she went to visit a good friend who was very ill. This friend asked her if she ever thought of becoming a doctor before. Elizabeth laughed and said, that is a silly thought because women are not allowed to become doctors. Her friend did not live long after that day. As time went on, Elizabeth thought more and more about her friend's suggestion.

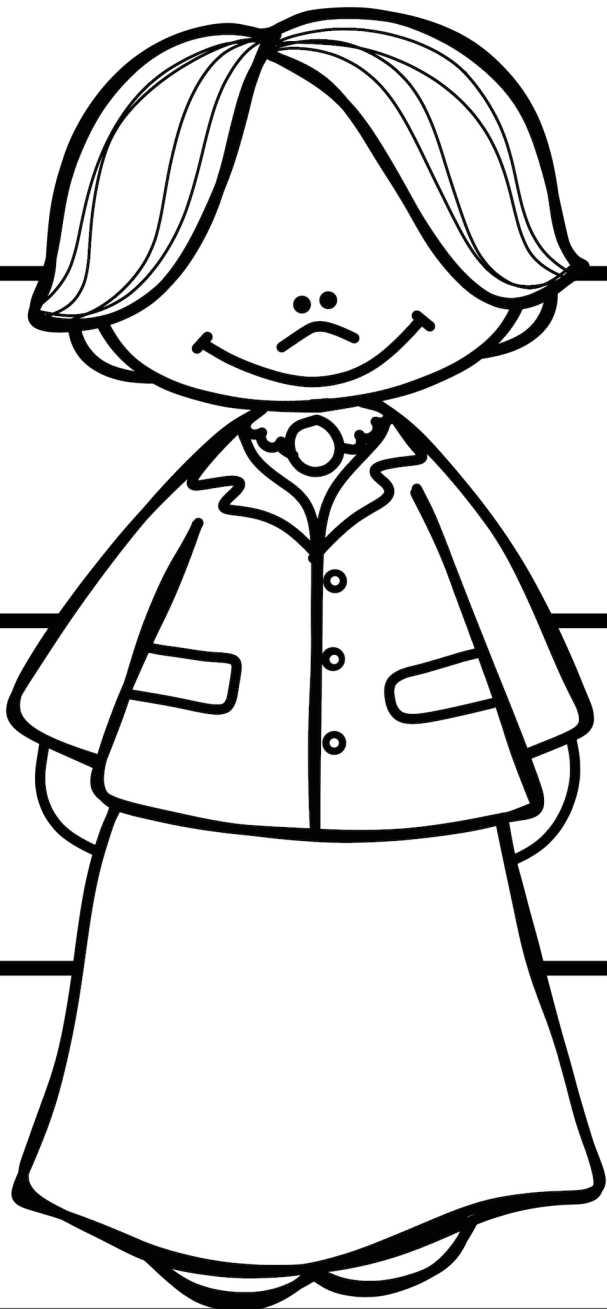
Elizabeth applied to dozens of medical schools, but all but one refused to let her study there. Some of her friends even encouraged her to dress up as a man so she could go to college. Finally, a small college in New York allowed her into their medical program. In 1849, Dr. Elizabeth Blackwell became the first woman in the United States to receive her medical degree. Getting her medical degree was only part of the battle! No hospital in America would hire her. Dr. Blackwell didn't give up! She moved to Europe so she could work there. During that time, women had more liberties in Europe than in the United States.

Years later, Dr. Blackwell moved back to the U.S. and opened a clinic in New York. Most of her patients were poor and had never been to see a doctor in the past. Dr. Blackwell wrote many articles and gave speeches to teach women about nutrition for children, and the importance of exercise, and good hygiene. Eventually, her small clinic turned into a medical school for women. The clinic that Dr. Blackwell started many years ago has treated more than a million patients to this day.

Dr. Elizabeth Blackwell is remembered for her dedication to medicine and good patient care. She played a major role in educating women about nutrition and inspired many to follow their dreams of having a career. Today, thousands of women doctors follow in Dr. Blackwell's footsteps.



# Elizabeth Blackwell



Write 3 facts about Elizabeth Blackwell in the boxes below.

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# Meet Anton Van Leeuwenhoek

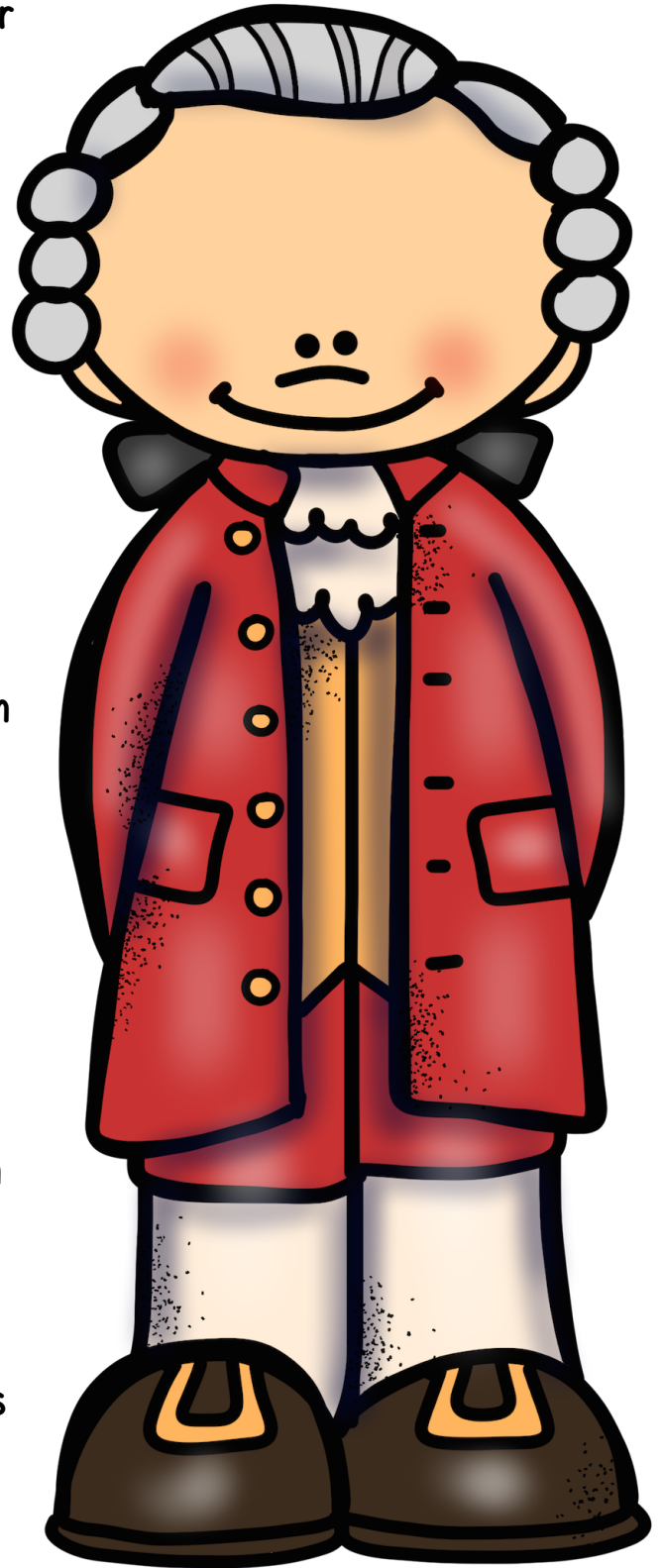
Anton van Leeuwenhoek was born in Holland in 1632. As a boy, Anton was very curious about the world around him. Anton even made his own magnifying lenses out of pieces of glass.

One afternoon, Anton brought back some water from a local lake. As he looked through the water, it looked hazy and not as clear as he thought it should. This made him curious. He placed a drop of water under his magnifying lens to get a closer look. Inside the water, he could see tiny things squirming around. They were too small to see with your eyes, but using the microscope he could see them moving all around.

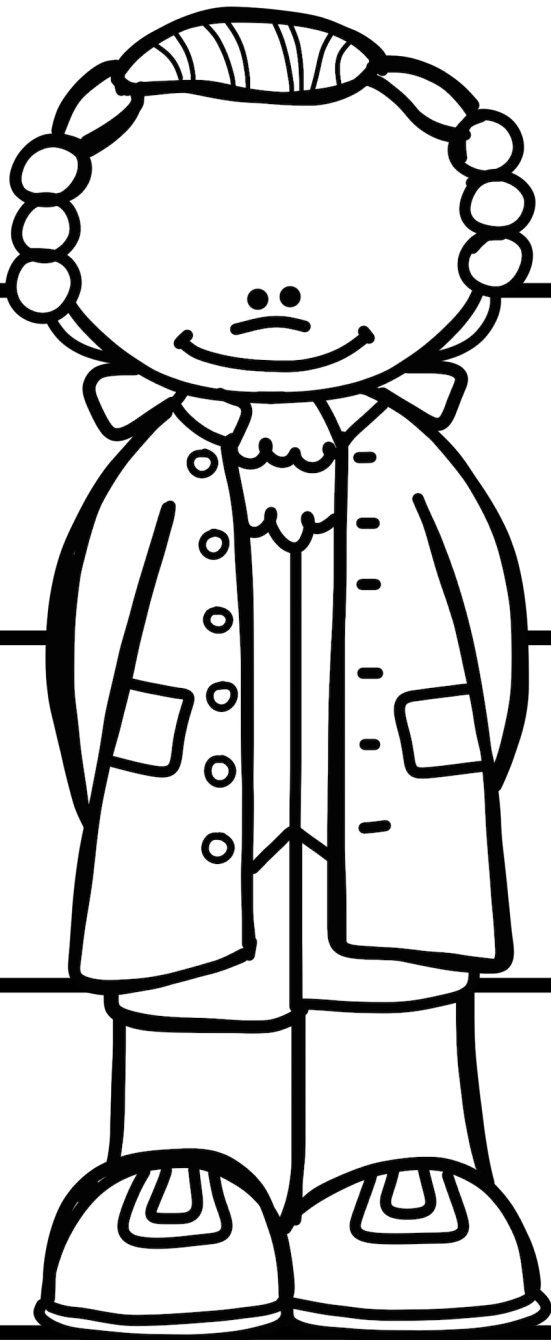
Anton grew more curious and scraped some brown stain from his teeth. During those days, people did not have toothpaste to brush their teeth like we do now. Back under the microscope, he saw tiny, squirming creatures that were living inside his mouth. He named them animalcules, which means "tiny little animals." Today, we called these "microorganisms." Microorganisms are tiny living things.

Anton continued to experiment by building more powerful microscopes. In fact, he built more than two hundred microscopes to get the best possible view of these microorganisms. Then he studied everything he could find including blood, ants, flowers, and meat, through the lens of his microscope. People from all over heard the news and came to see with their own two eyes. The Queen of England was one of them.

Anton van Leeuwenhoek is famous for making two important scientific discoveries. The first is there are microorganisms everywhere all around us. Secondly, he figured out how to make lenses to magnify these tiny creatures so we can see them.



# Anton Van Leeuwenhoek



Write 3 facts about Anton Van Leeuwenhoek in the boxes below.

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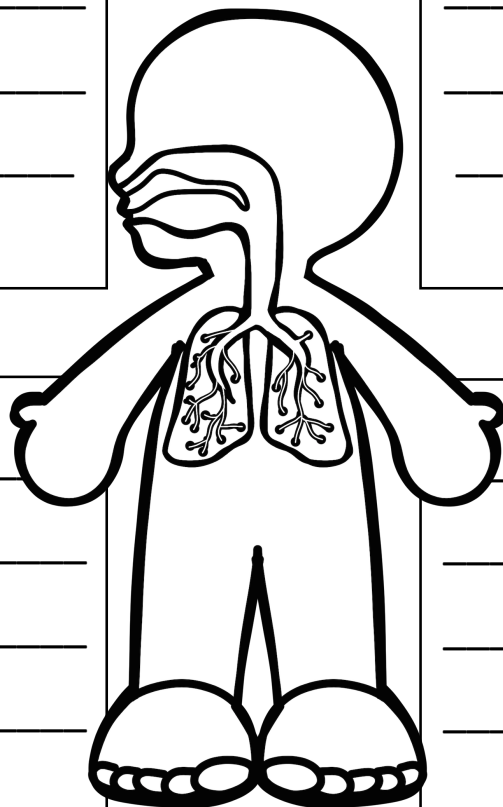
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Tell 4 facts below about our respiratory system & how it works.

**5.**

Four horizontal lines for writing facts.

Four horizontal lines for writing facts.



Four horizontal lines for writing facts.

Four horizontal lines for writing facts.

→ **THE FACTS** ←

Directions: answer the questions about respiration below.

4.

How does your nose  
help with breathing?

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What is the main job  
of the heart?

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What happens inside  
the lungs?

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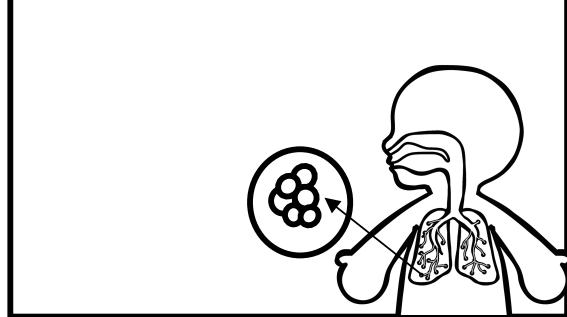
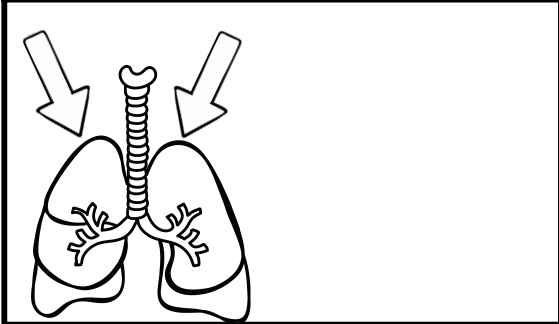
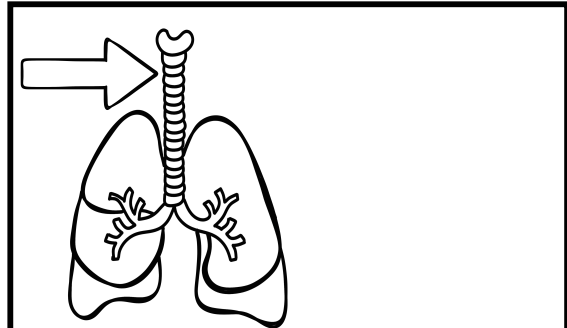
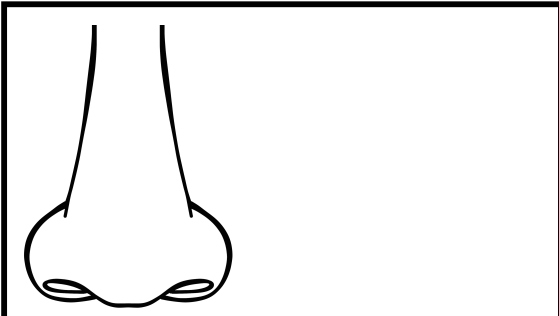
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**BIG HELPERS**



Directions: Can you name the organs that help with respiration shown below?

3.



**ORGANS**

Word Bank:

carbon    organs    breathe    bodies    lungs    talk    oxygen

**2.**

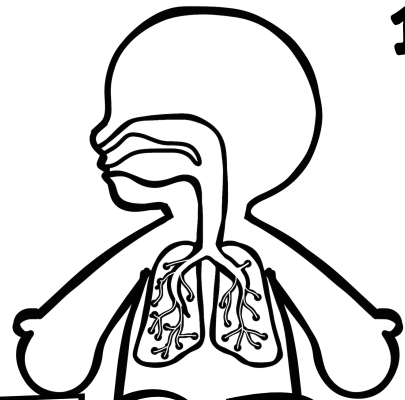
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Humans need \_\_\_\_\_ to stay alive. Our respiratory system is made up of many different \_\_\_\_\_ and parts that work together so we can \_\_\_\_\_. When we breathe in, we are taking oxygen into our \_\_\_\_\_. When we breathe out, we exhale \_\_\_\_\_ dioxide. Your \_\_\_\_\_ are part of the respiratory system that allow you to take in oxygen, get rid of carbon dioxide, and \_\_\_\_\_.

# RESPIRATION

Name: \_\_\_\_\_

**1.**

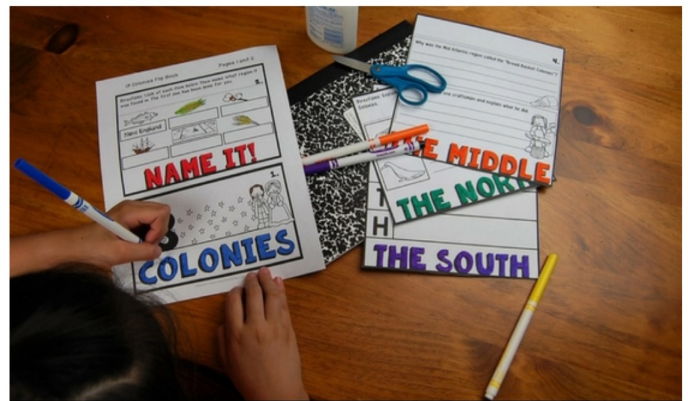


# RESPIRATORY SYSTEM

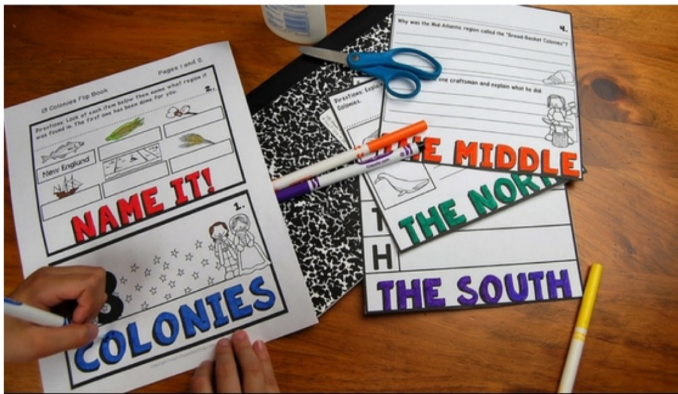
# Directions for Flip Booklet



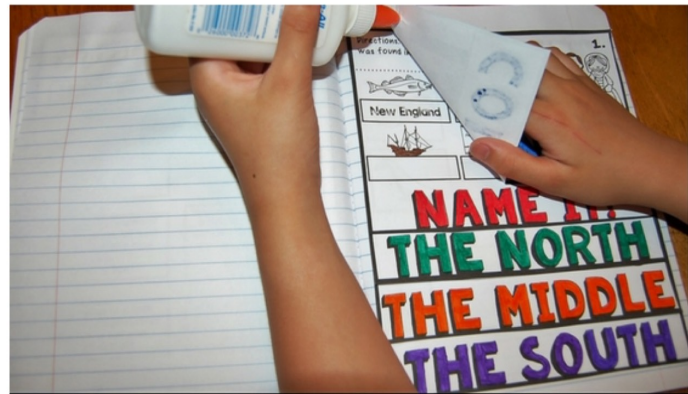
Flip Books  
Step 1: Answer the questions on each page



Flip Books  
Step 2: Color the Titles on each page



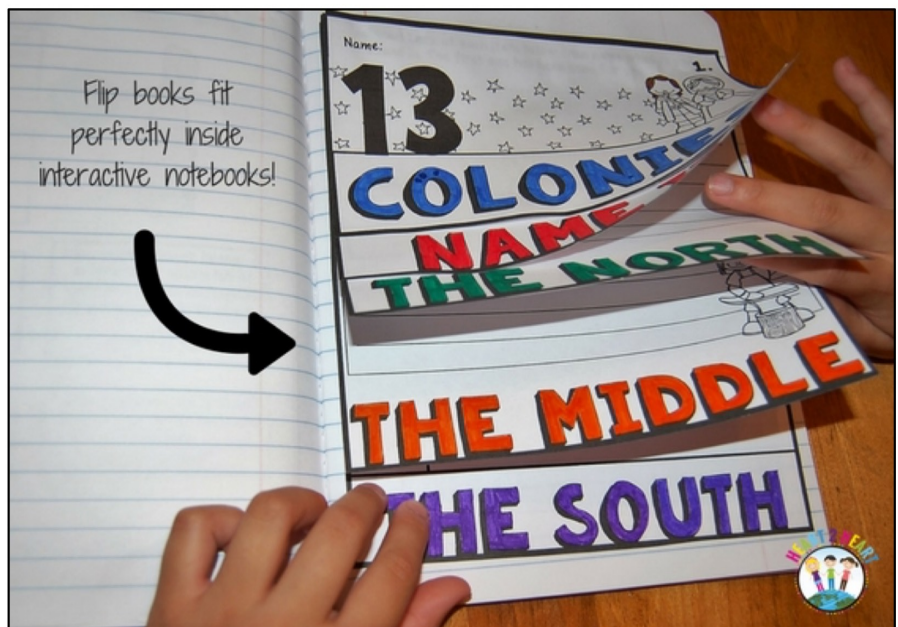
Flip Books  
Step 3: Cut out each page



Flip Books  
Step 4: Glue in notebooks in the correct order



Students flip for flip books!  
They work great as a fun activity or as a tool to review at the end of a unit.



# **Respiratory System Vocabulary**

**Inhale**

**Exhale**

**Respiration**

**Lungs**

**Oxygen**

**Carbon Dioxide**

Name: \_\_\_\_\_

# Spotlight on Vocabulary

Inhale:

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Exhale:

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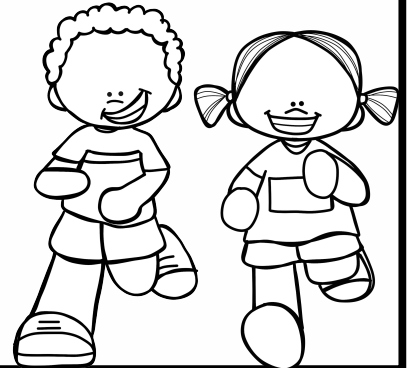


Respiration:

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Oxygen:

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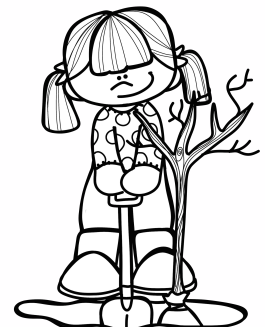


Carbon Dioxide:

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# Inhale



**To inhale means to  
breathe in.**

# Exhale



**To exhale means to  
breathe out.**

# Respiration



**Respiration is the act of breathing or taking in oxygen from the air and exhaling carbon dioxide.**



# Lungs



**Your lungs allow you to take in oxygen from the air and get rid of carbon dioxide.**

# Oxygen



**Every cell in our body uses oxygen and food to make energy and keep us alive. When we breathe in, we are taking oxygen into our bodies.**

# Carbon Dioxide



**When we breathe out, we exhale carbon dioxide. Plants need carbon dioxide for life.**