

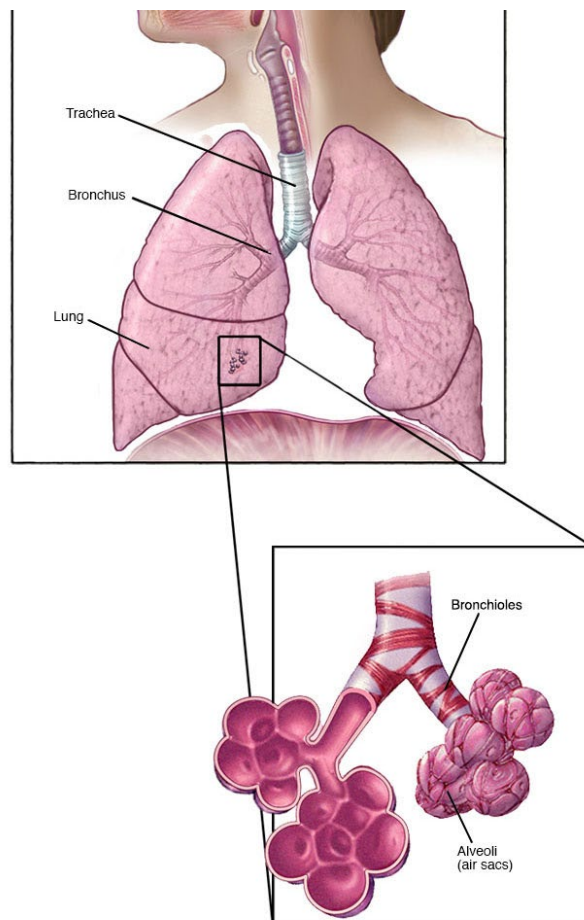
## Respiratory System Part 2

### Bronchi, Bronchioles and Alveoli

A **bronchi (bronchus if plural)** is the main passageway for the air you breathe to move into the lungs. As you know, when you take a breath through your nose or mouth, the air travels into the trachea. The trachea then carries the air to the left and right **bronchus** (bronchi if only talking about one)

The bronchi **become smaller** the closer they get to the lung tissue and are then considered **bronchioles**. Each bronchiole is about the same thickness as a hair and you have around 30,000 of them in **each** lung.

At the end of each bronchiole, you will find a bunch of **alveoli**. There are even more of these than there are bronchioles! In fact, there are about **600 million** alveoli in your lungs and if you stretched them out, they would cover an entire tennis court! So what do these little things do? The alveoli **give your blood the oxygen** from the air you inhaled and then **take back the carbon dioxide** to be exhaled.



## Lungs

Your lungs are in your chest, and they are so large that they take up most of the space in there. You have two of them, but **they aren't the same size** the way your eyes or nostrils are. Instead, the lung on the left side of your body is a bit smaller than the lung on the right. **Can you guess why this might be?** Think about a vital organ that can be found on the left side of your body...

Your heart! That's right, this extra space on the left leaves room for your heart.

On average, you breathe about **12-20 times per minute**. Every time you take a breath in, your lungs expand as the air fills them up. Most people have two lungs, however, it is possible to live a relatively normal life with only one lung!

So why would people only have one lung? Well, sometimes people's lungs can become unhealthy due to things like smoking for example. In these cases, sometimes a diseased lung is removed to help get rid of the problem. Some lung diseases might also force doctors to remove a lung from their patient. Did you know that the study of lung disease is called **pulmonology**?



## Keeping Your Lungs Healthy

Your lungs play an important role in the overall health of your body.

If your lungs aren't functioning properly, it can be really difficult to breathe. When you can't breathe, you really can't do much physically or mentally since your body can't intake enough oxygen! So it's important that you **do your best to keep your lungs in shape**. Exercising and getting out into nature where there is fresh, clean air are two easy ways to make your lungs happy.

Most importantly though, **never smoke or vape**. These are activities that are extremely harmful to your lungs and dangerous for your overall health. Cigarette and vape smoke **damages the cilia in the trachea** so they can no longer move to keep dirt and other substances out of the lungs. Your **alveoli get hurt too**, because the chemicals in cigarette smoke can cause the walls of the delicate alveoli to break down, making it much harder to breathe.

## Diaphragm



What exactly is a **diaphragm**? How important is its role in the respiratory system? Find out in the **video!** <https://youtu.be/rUVMok4Qp-Y>

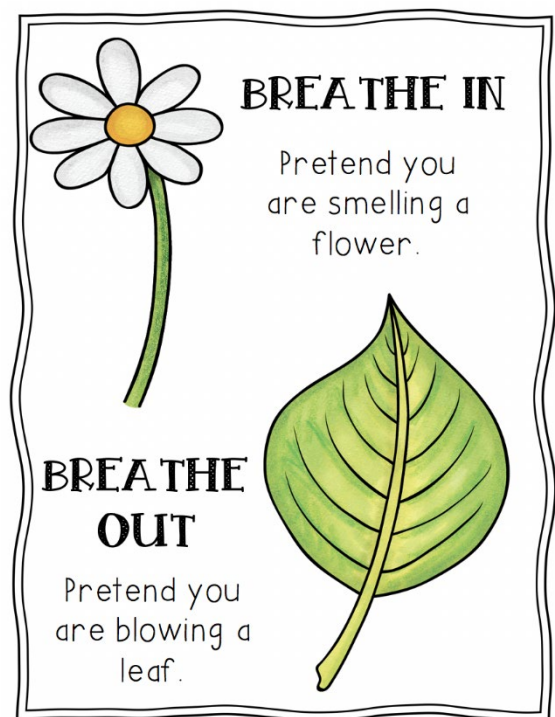
## Become Mindful of Your Breathing

As we know, most of the time we breathe without even noticing that we are doing so. It's necessary that our bodies be able to do this since daily life requires us to focus on other things while still breathing steadily.

However, it's important that everyone takes **at least 2-5 minutes a day to focus on breathing**. This means setting time aside to do nothing else but breathe. Controlling your respiratory system actually has the ability to affect the way other systems in your body function. In as little as 2-5 minutes, being mindful of your breathing has the ability to **lower negative emotions** like stress, panic, nervousness, and anxiety and give your body a mini '**reset**' or '**reboot**'. You may even find yourself being able to **think more clearly or creatively** after participating in this practice.

When you participate in focused/mindful breathing, you want to make sure that you are taking **deep belly-breaths**. This means really focusing on expanding your stomach with every breath you take. If you can, try to **breathe in through your nose**, and **out through your mouth**.

**Remember**, like everything, becoming good at focused breathing actually **takes practice!**



## Focused Breathing Activity

Now that you understand the importance of setting time aside to really focus on your breathing and the benefits of doing so, follow along with the video below.



Take these few minutes to focus all of your attention and energy on this activity:  
<https://youtu.be/YFdZXwE6fRE>

### 1.3 THE RESPIRATORY SYSTEM

10. When bronchi become small the closer, they get to the lungs, they are then called:

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11. What do the alveoli do?

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12. Why is your left lung smaller than your right lung?

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13. True or False: If the statement is false, change it so that it becomes true.

You need both of your lungs to live a healthy, normal life:

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14. What are two ways that you can keep your lungs happy and healthy?

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15. **Operation Ouch- The Diaphragm:** Watch the “Operation Ouch- The Diaphragm” video and answer the following questions:

1. What is the main muscle you use when you breathe?

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2. How many times do you breathe in and out in a day?

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16. How can breathing mindfully help you? Name 2 ways.

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17. Fill in the blanks:

1. When you participate in focused/mindful breathing, you want to make sure that you are taking \_\_\_\_\_. This means really focusing on - \_\_\_\_\_ your stomach with every breath you take. If you can, try to breathe in through your \_\_\_\_\_, and out through your \_\_\_\_\_.

18. After having completed the Focused Breathing Activity, how do you feel? Are there any differences in your body after you took this time to relax and be mindful of your breathing?

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19. **Track your breathing:** For this activity, all you need is a stopwatch. You can use a regular clock, or one found on a smartphone.

**Instructions:** Read all instructions before beginning this activity

1. Count the number of breaths you take in one minute and record the result. This is your **resting respiration rate**. Record your results in a chart like the one below.
2. Take a deep breath and hold it as long as you can. Let out the breath as soon as you begin to feel uncomfortable. Record the length of time you can hold your breath. This is your **resting breath holding capacity**. Record your results in the chart.
3. Run in place, as quickly as possible, for three minutes.
4. After running, count the number of breaths you take in one minute and record the result. This is your **activity respiration rate**. Record your results in the chart.
5. Run for another three minutes.

6. Take a deep breath and hold it as long as you can. Let the breath out as soon as you begin to feel uncomfortable! Record the length of time you held your breath. This is your **activity breath holding capacity**. Record your results in the chart.

**Observations:**

Resting Respiration Rate:	breaths per minute
Resting Breath Holding Capacity:	seconds
Activity Respiration Rate:	breaths per minute
Activity Breath Holding Capacity:	seconds

a) Given your observations and what you know about how the body works, why do you think there is a difference between the length of time you can hold your breath when you are at rest and after you have exercised?

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b) Try this activity with someone else. Were their results the same as yours or different?

Why do you think that is?

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20. Label the respiratory system on the next page.

# The Respiratory System

- Word Bank**
- The lung
  - The diaphragm
  - The trachea
  - The bronchioles
  - The bronchi/bronchus
  - The alveoli

