

# The Respiratory System

# Learning Intention


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What will I know?

1. The function of the respiratory system.
2. The difference between respiration and the breathing.

# Success Criteria

What can I do?

1. State the two main functions of the respiratory system.
  2. State the equation for respiration.
  3. Explain the difference between respiration and breathing.
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## Think – Pair – Share

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On your whiteboards,  
write down any words  
you already know that  
you think relate to the  
respiratory system.

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**Respiration  
is not  
breathing!!!**

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**respiration is**

**the break down**

**of glucose**

**to release energy**



**Respiration  
occurs in all  
living organisms**



**including**

**plants !!!**



# Plants

**During the day:**



**respiration &  
photosynthesis**

**At night:**

**respiration  
only**





# Respiration

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Respiration is not breathing. Respiration is the breakdown of glucose to release energy. Oxygen is needed for this reaction to occur.



# Question -

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**Why do we  
need energy??**

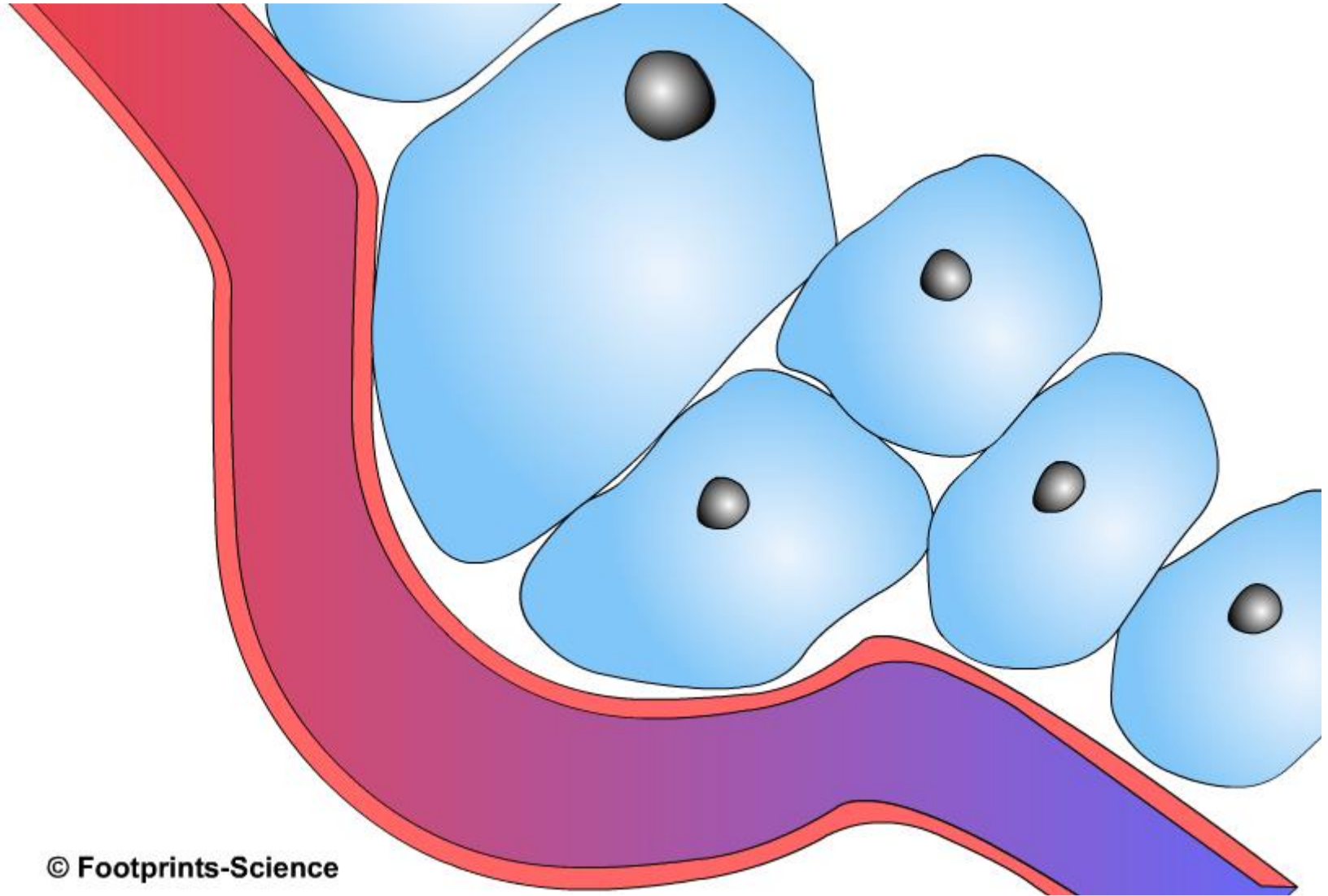




teachmeanz



# Respiration




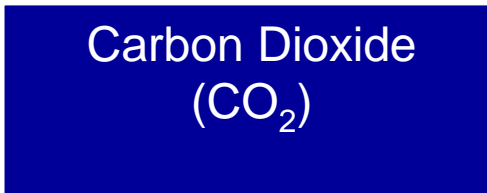
# The Function of the Respiratory System

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The respiratory system is required so that oxygen can enter the bloodstream (for respiration) and carbon dioxide can leave the bloodstream (a waste product that is produced by respiration and needs to be removed).



  Oxygen (O<sub>2</sub>)

  Carbon Dioxide (CO<sub>2</sub>)



# Learning Intention


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## What will I know?

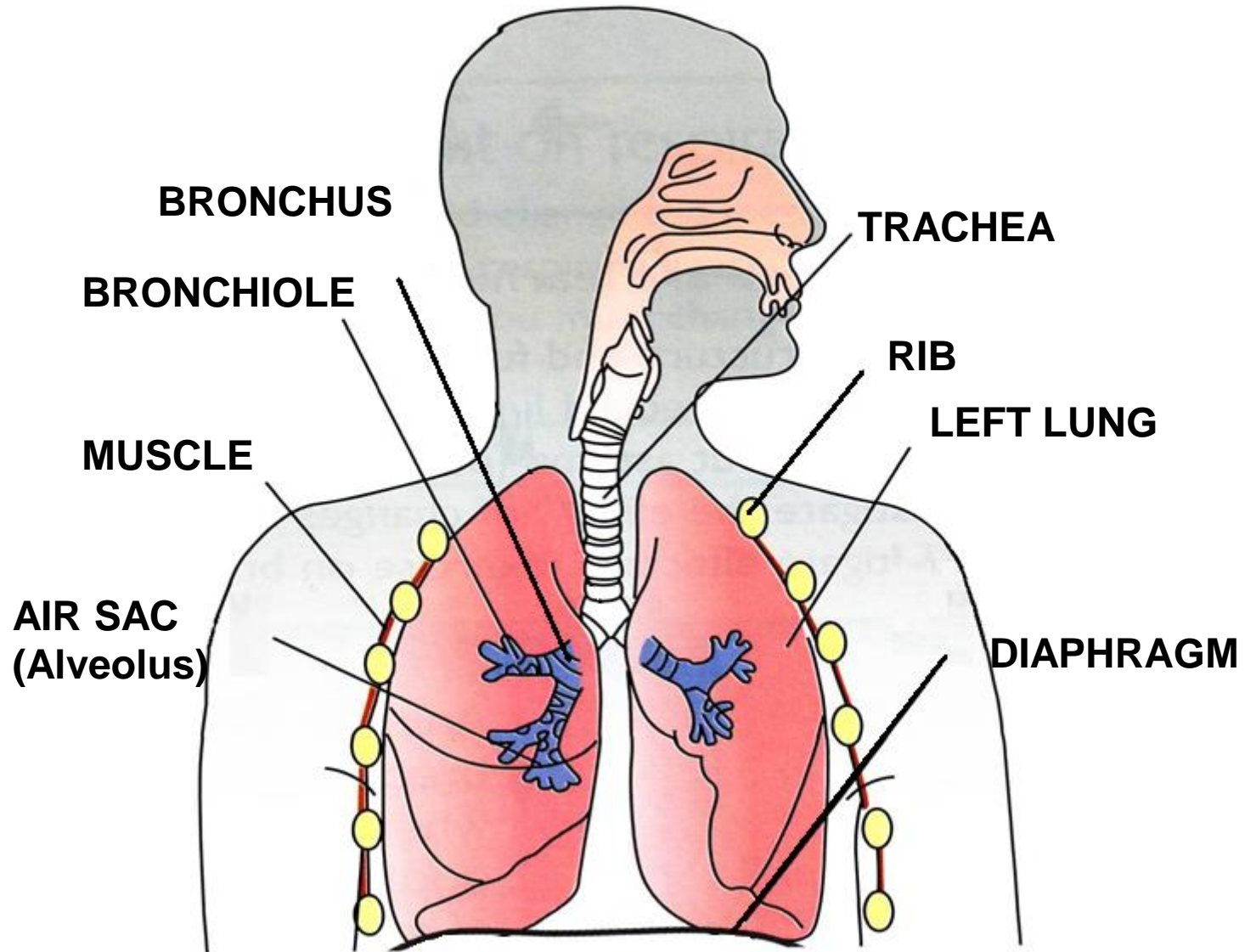
1. The structures of the respiratory system.
2. Gas exchange in the alveoli.

# Success Criteria

## What can I do?

1. Label a diagram of the respiratory system.
  2. Describe what is meant by the term “gas exchange”.
  3. Describe how the alveolus is adapted for gas exchange.
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# The Human Respiratory System



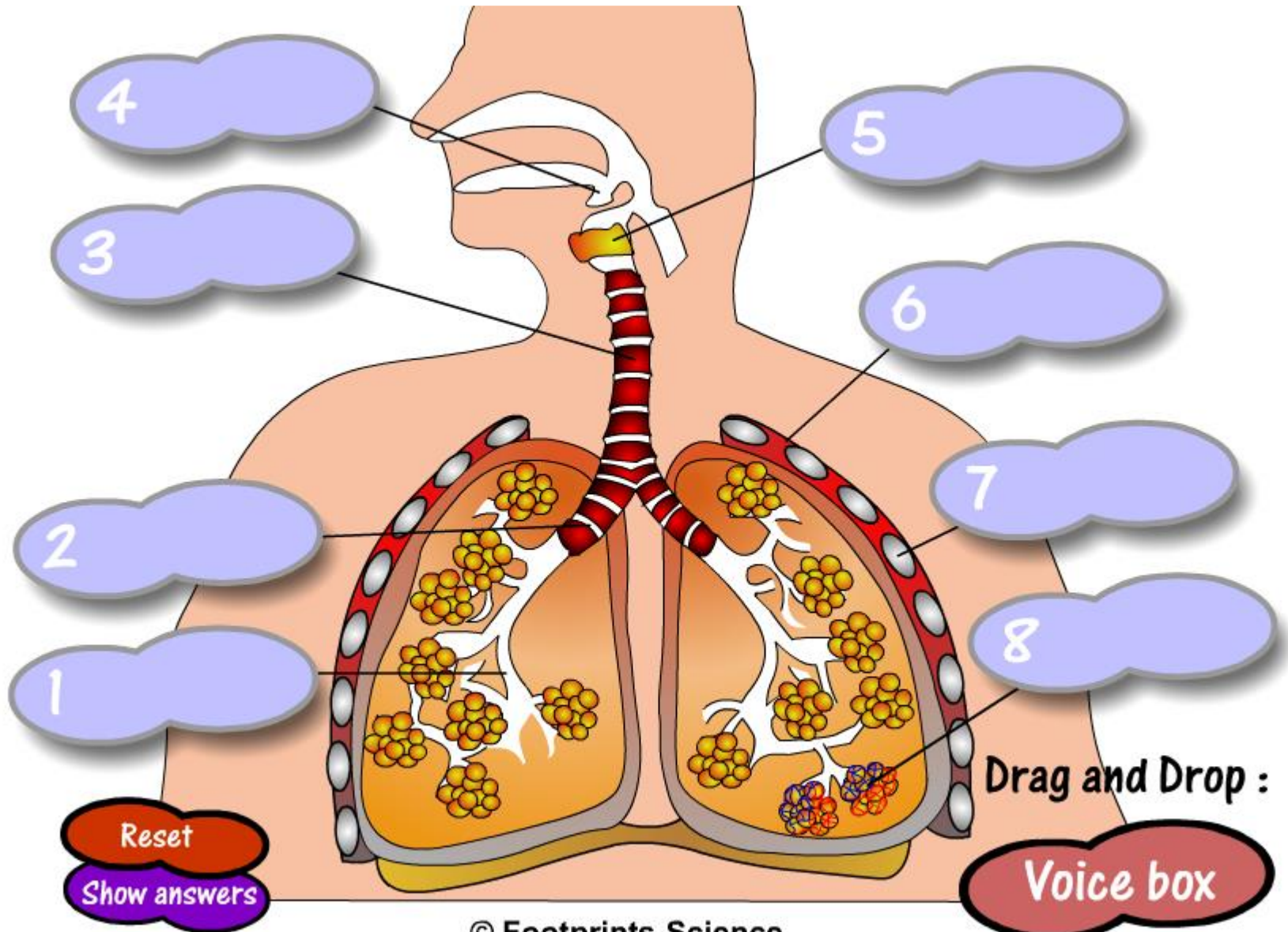
# Complete worksheet 15.3 Cut & Stick of the respiratory system.

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# The Lungs



# Recap – Unscramble the name of each of these structures of the respiratory system.

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1. oihbncr                      Bronchi
  2. sloihcbtnreo                Bronchioles
  3. usgln                         Lungs
  4. sirb                            Ribs
  5. eilvaol                        Alveoli
  6. rachteae                      Trachea
  7. ghprmiada                    Diaphragm
- 



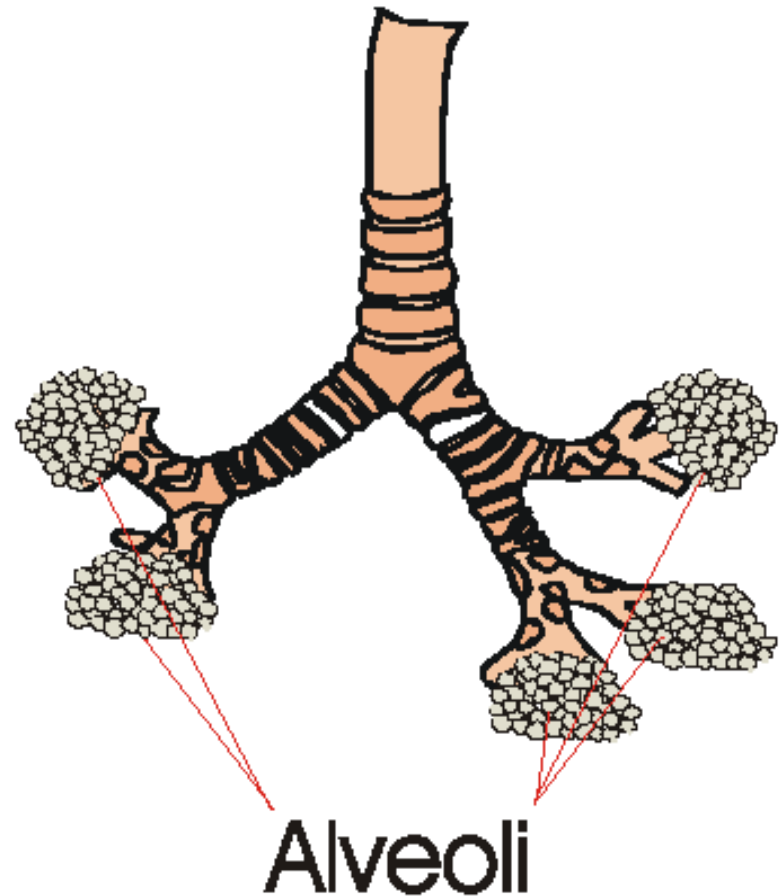
# Gas Exchange



We need to get **oxygen** from the air into the blood, and we need to remove waste **carbon dioxide** from the blood into the air.

Swapping of these gases is called **gas exchange**.

Gas exchange takes place in the alveoli, the little round structures ('air sacs') at the end of the bronchioles in our lungs.



Our lungs contain millions of alveoli. Each **alveolus** is wrapped up in tiny blood vessels called capillaries.

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**The net around the oranges  
is like the network of capillaries around the alveoli**

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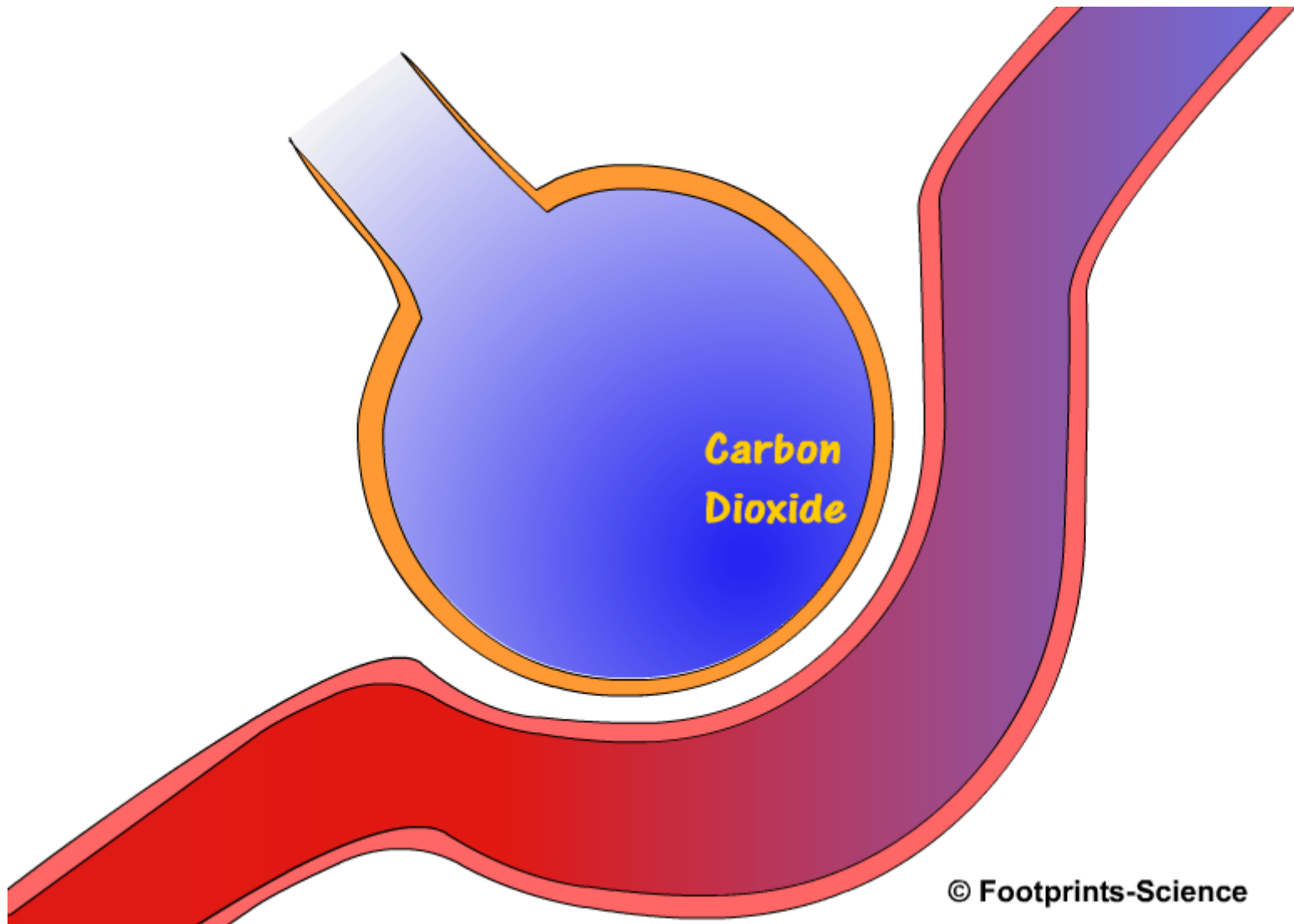
# Video

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<http://www.bbc.co.uk/education/clips/z4g6sbk>



# Alveoli



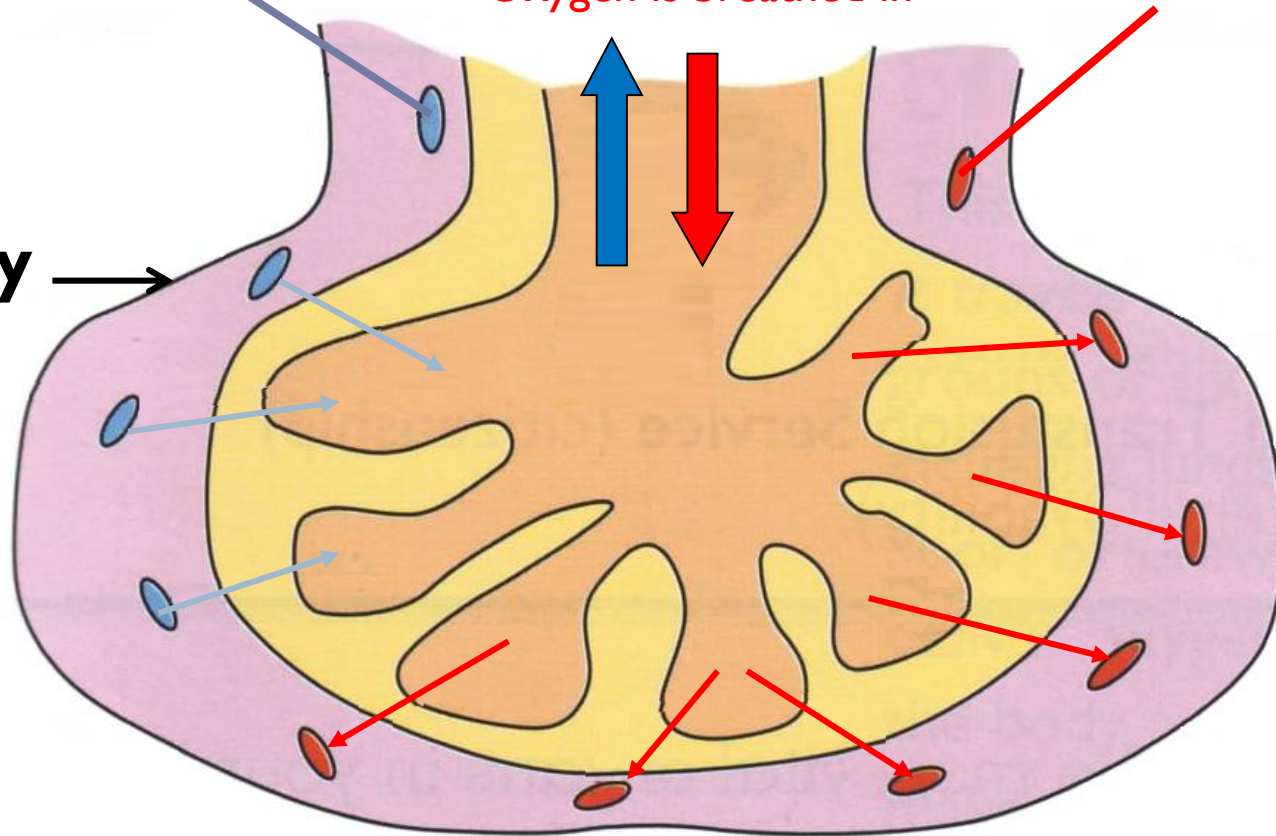
# Complete the diagram and stick it into your notes

Carbon dioxide enters the alveolus.

Carbon dioxide is breathed out  
Oxygen is breathed in

Oxygen enters the bloodstream

capillary



# Lung alveoli worksheet 15.4

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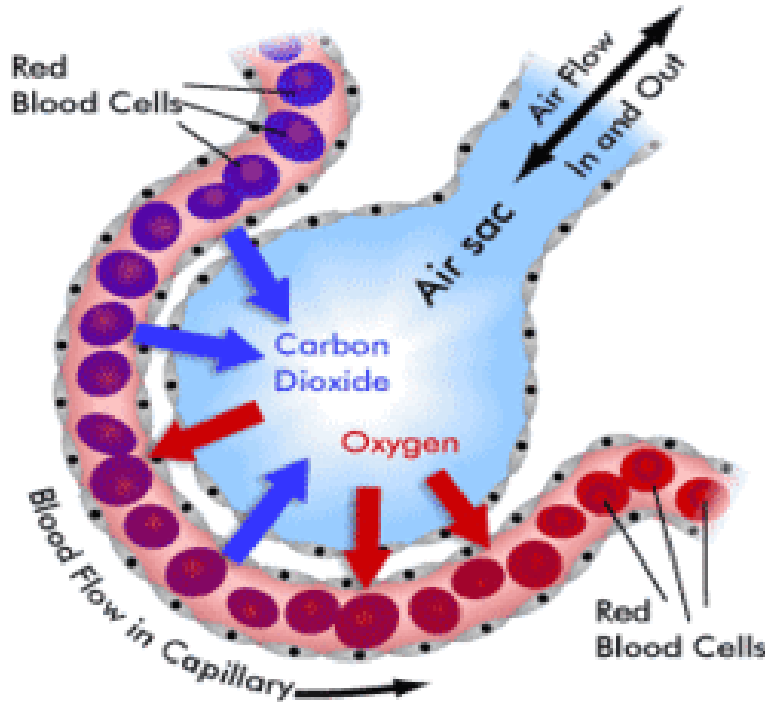


# Adaptations of alveoli



**Rich blood supply**

**Permeable**—  
alveolar and  
capillary walls  
allows gases to  
pass through



**Moist** to allow  
oxygen to  
dissolve and  
diffuse

**Thin** capillary walls and  
alveolar walls so there is a  
short diffusion distance

**Large surface  
area** – spherical  
shape

# Alveoli are well designed because they have...

1

- to allow gases to pass through

2

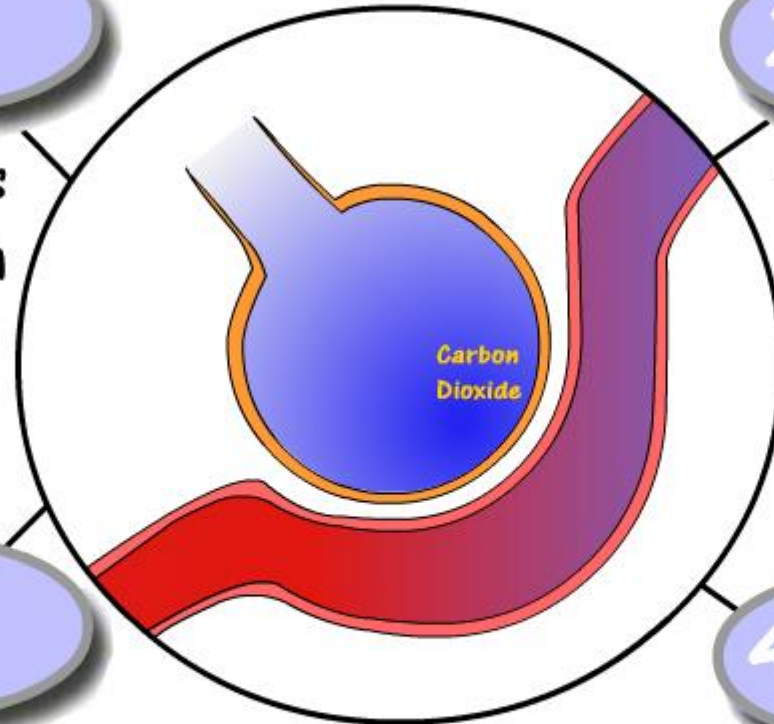
- for maximum oxygen to enter the blood

3

- the size of a tennis court

4

- for dissolving gases



Reset

Show answers

Drag and Drop the following labels :

Good blood supply

# Homework – W/S 15.6

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# Learning Intention

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What will I know?

1. The mechanism of breathing.

## Success Criteria

What can I do?

1. Describe what happens to the Intercostal muscles, Ribs, Volume in chest cavity & Pressure in chest cavity during inhalation.
2. Describe what happens to the Intercostal muscles, Ribs, Volume in chest cavity and Pressure in chest cavity during exhalation.

# The 2 breathing processes

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The body separates the procedure of breathing in and breathing out.

**Breathing in** is one process and is known as...

## Inhalation

(When we breathe in we inhale)

**Breathing out** is a separate process and is known as...

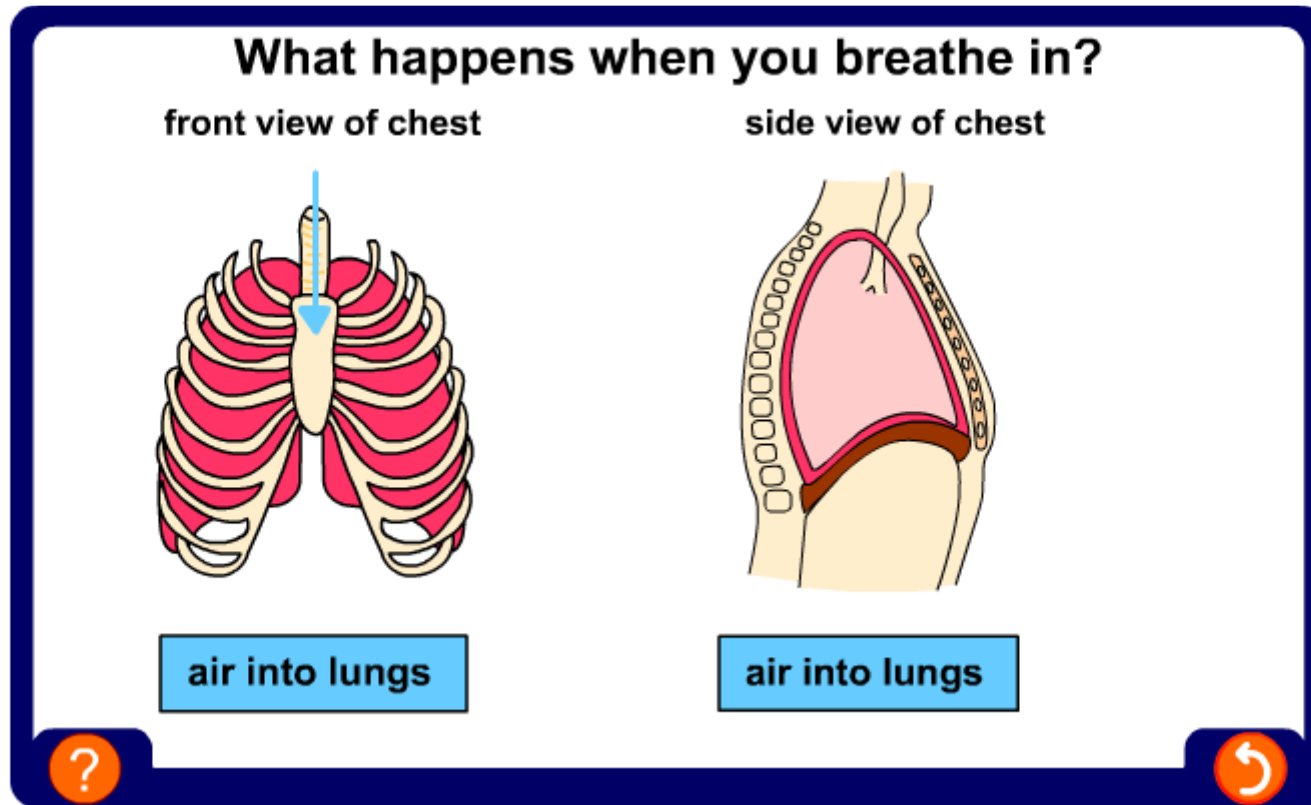
## Exhalation

(When we breathe out we exhale)

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# Inhalation



Remember M – Muscles Contract (Intercostal and Diaphragm) Diaphragm flattens.

R – Ribs move up and out.

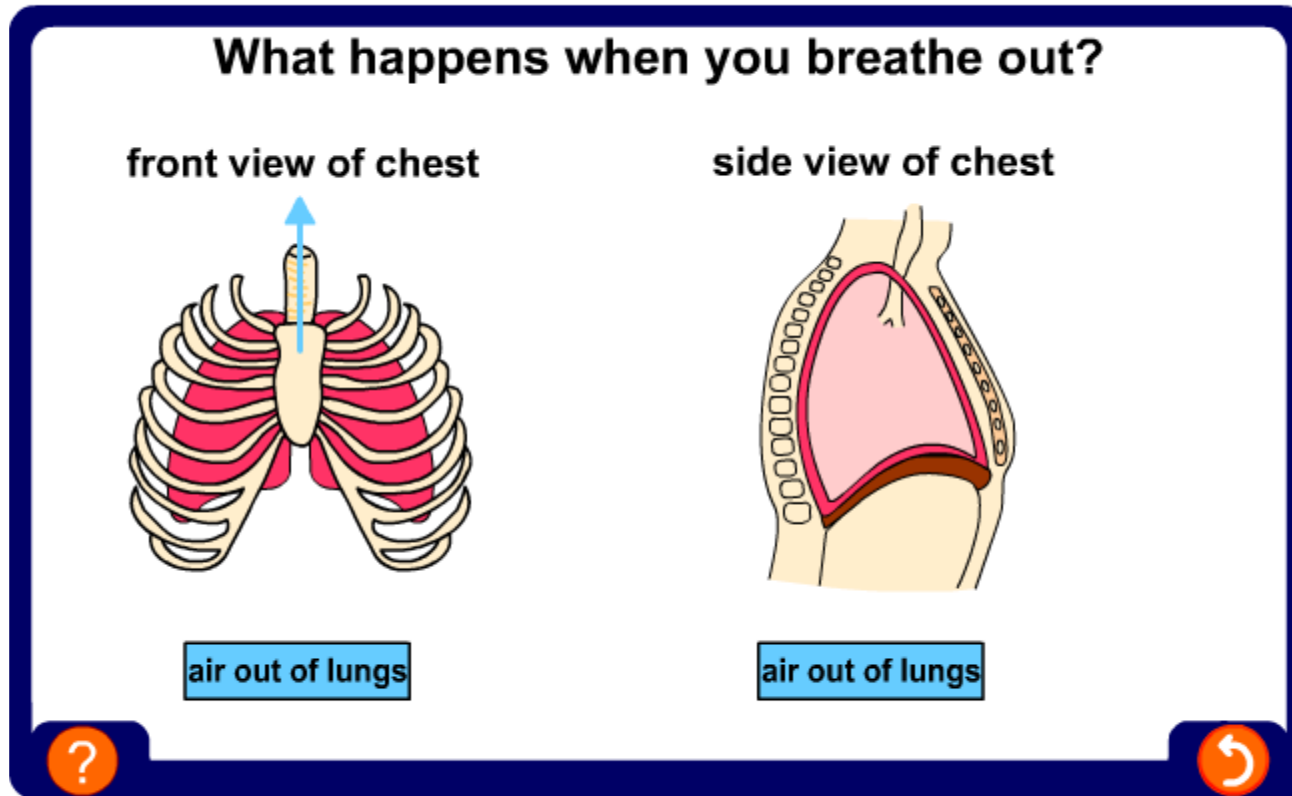
V – Volume Increases

P – Pressure Decreases

Air rushes in as atmospheric pressure higher than pressure in chest.



# Exhalation



Muscles relax – Diaphragm is dome shaped.

Ribs move down and in.

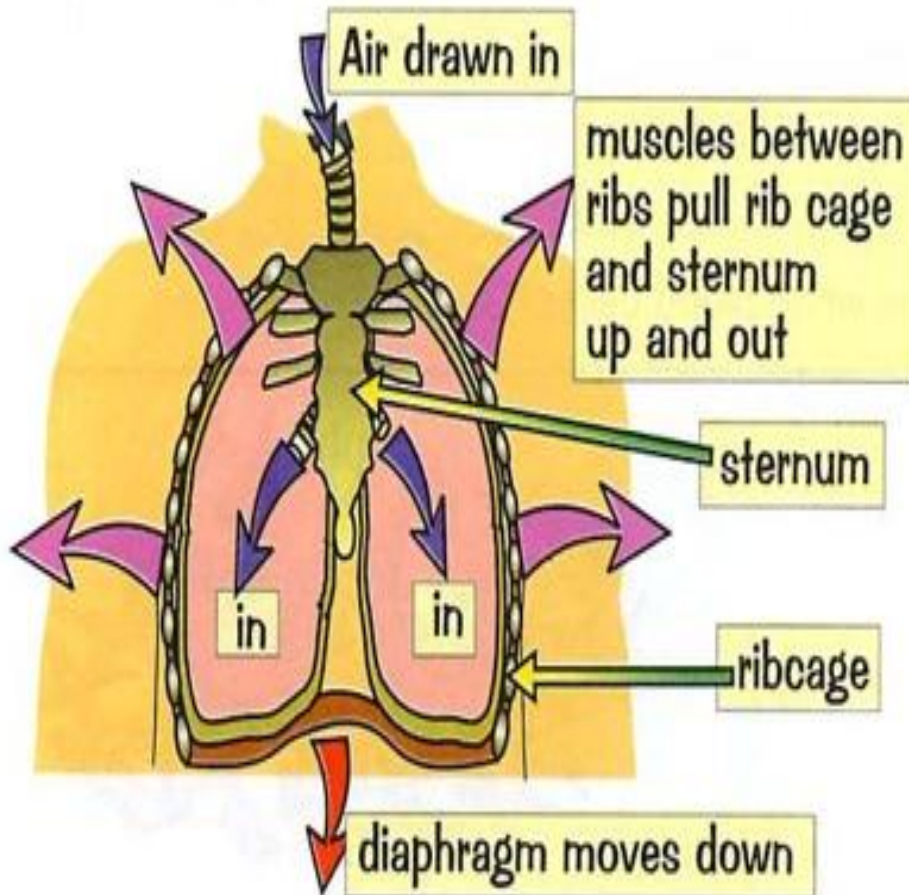
Volume decreases.

Pressure increases – Air rushes out as pressure in chest cavity is higher than atmospheric pressure.

## Breathing In...

- 1) Intercostals and diaphragm **CONTRACT**.
- 2) Thorax volume **INCREASES**.
- 3) Air is **DRAWN IN**.

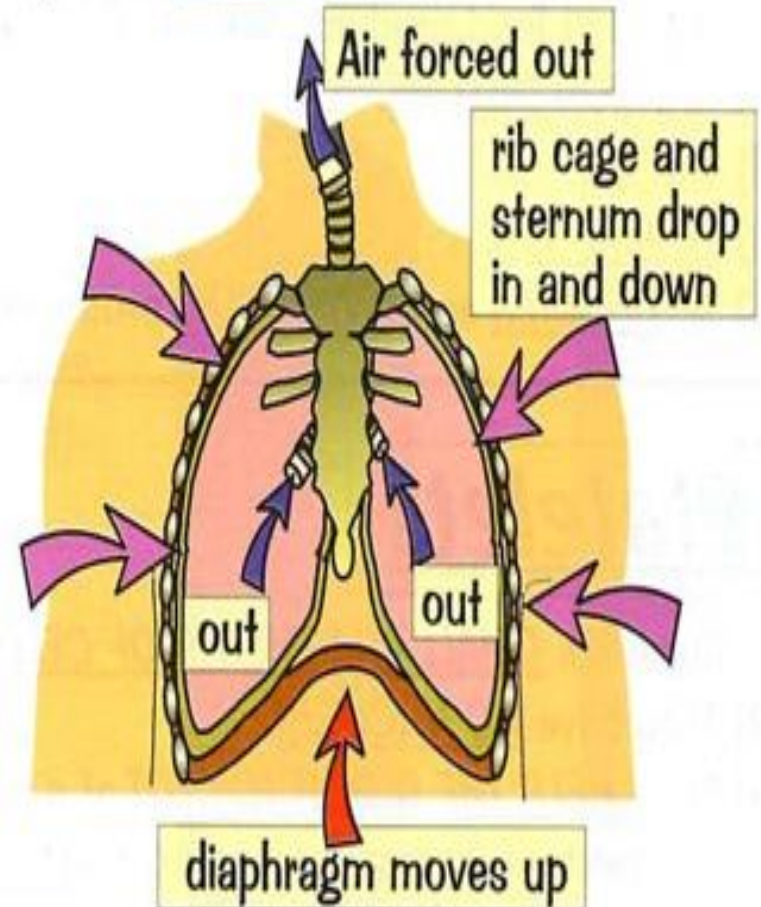
Pressure  
decreases



## ...and Breathing Out

- 1) Intercostals and diaphragm **RELAX**.
- 2) Thorax volume **DECREASES**.
- 3) Air is **FORCED OUT**.

Pressure  
increases





# CURRICULUM

## BITES

### BREATHING

# Create your own lung model:

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## ***What you will need***

- ▶ A plastic bottle
- ▶ 2 straws
- ▶ An elastic band
- ▶ Scissors
- ▶ 2 balloons
- ▶ Play dough



# Make your own model!

- ▶ 1. Remove the bottom of your bottle.
- ▶ 2. Tie a knot in one end of a balloon and snip off the fat end.
- ▶ 3. Stretch this end around the bottom of your plastic bottle.
- ▶ 4. Put a straw in the neck of the other balloon and secure tightly with the elastic band but not so that you crush the straw. The air must flow through, so test it with a little blow through the straw to see if the balloon inflates.
- ▶ 5. Put the straw and the balloon into the neck of the bottle and secure with the play dough to make a seal around the bottle – make sure that again, you don't crush the straw.



## Asthma Homework

1. What is Asthma? What happens to the bronchioles during an asthma attack? \_\_\_\_\_

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2. What are the symptoms of asthma?

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3. List five things that can trigger an asthma attack. \_\_\_\_\_

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4. How can asthma be treated?

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5. What important gas is decreased in the body during an asthma attack? Why is this dangerous? \_\_\_\_\_

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Research  
Homework  
for next  
lesson.



# Learning Intention

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## What will I know?

1. Lung Volume
2. What asthma is and triggers of asthma.
3. The relationship between height and lung volume.

# Success Criteria

## What can I do?

1. State the importance of lung volume.
  2. Describe why people suffering from asthma find it difficult to breathe.
  3. State at least 3 triggers of asthma.
  4. Calculate your own lung volume and height.
  5. Determine whether there is a relationship between lung volume and the height of an individual.
- 



Starter Activity – Think , Pair,  
Share

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**What animal has  
the largest lungs?**





A Blue Whale's lungs can hold up to 5,000 litres of air!!



# What is Lung Volume?

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The bigger the lungs, are the more oxygen can enter and carbon dioxide can leave the lungs.

To allow the maximum amount of oxygen and carbon dioxide to enter and leave the lungs, their size is extremely important.

The size of the lungs is measured as **lung volume**.



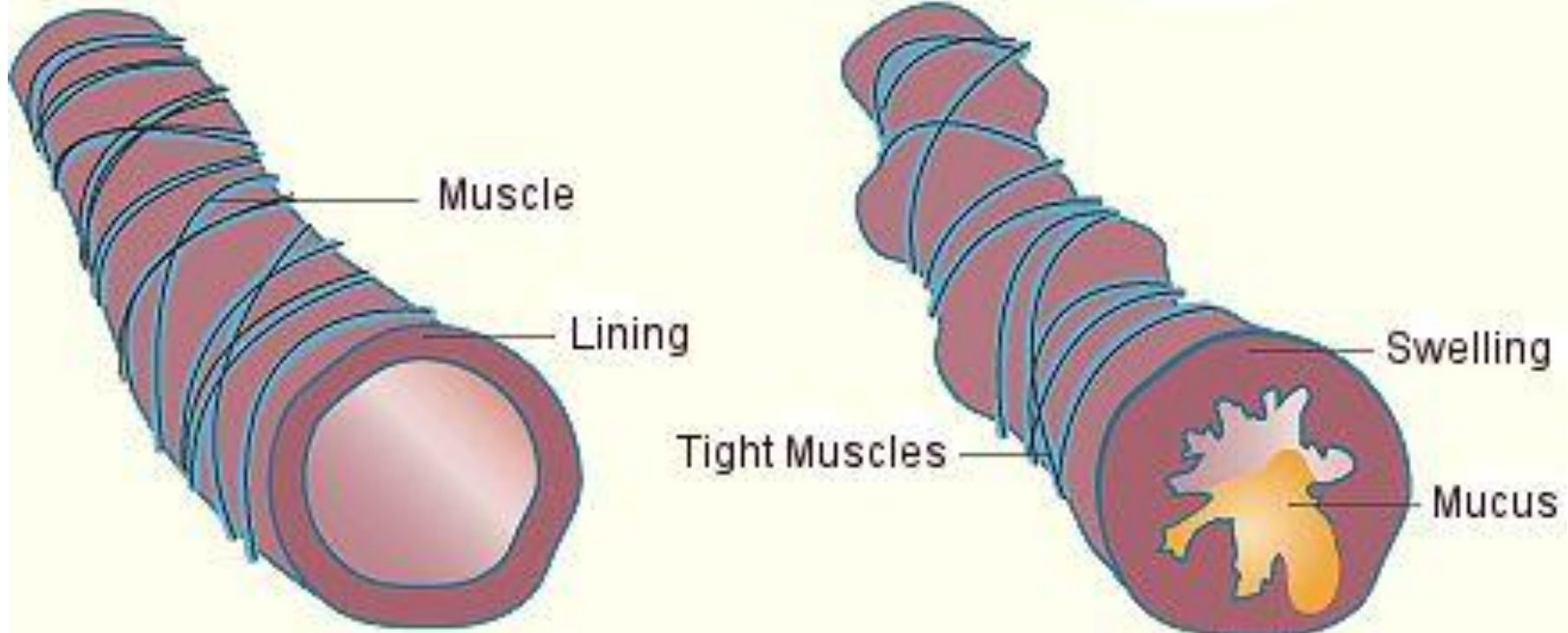
# Why is lung volume important?



Reduced lung volume is a feature of the condition asthma, that affects more than 5.2 million people in the UK!

**Normal Airway**

**Airway in Person with Asthma**



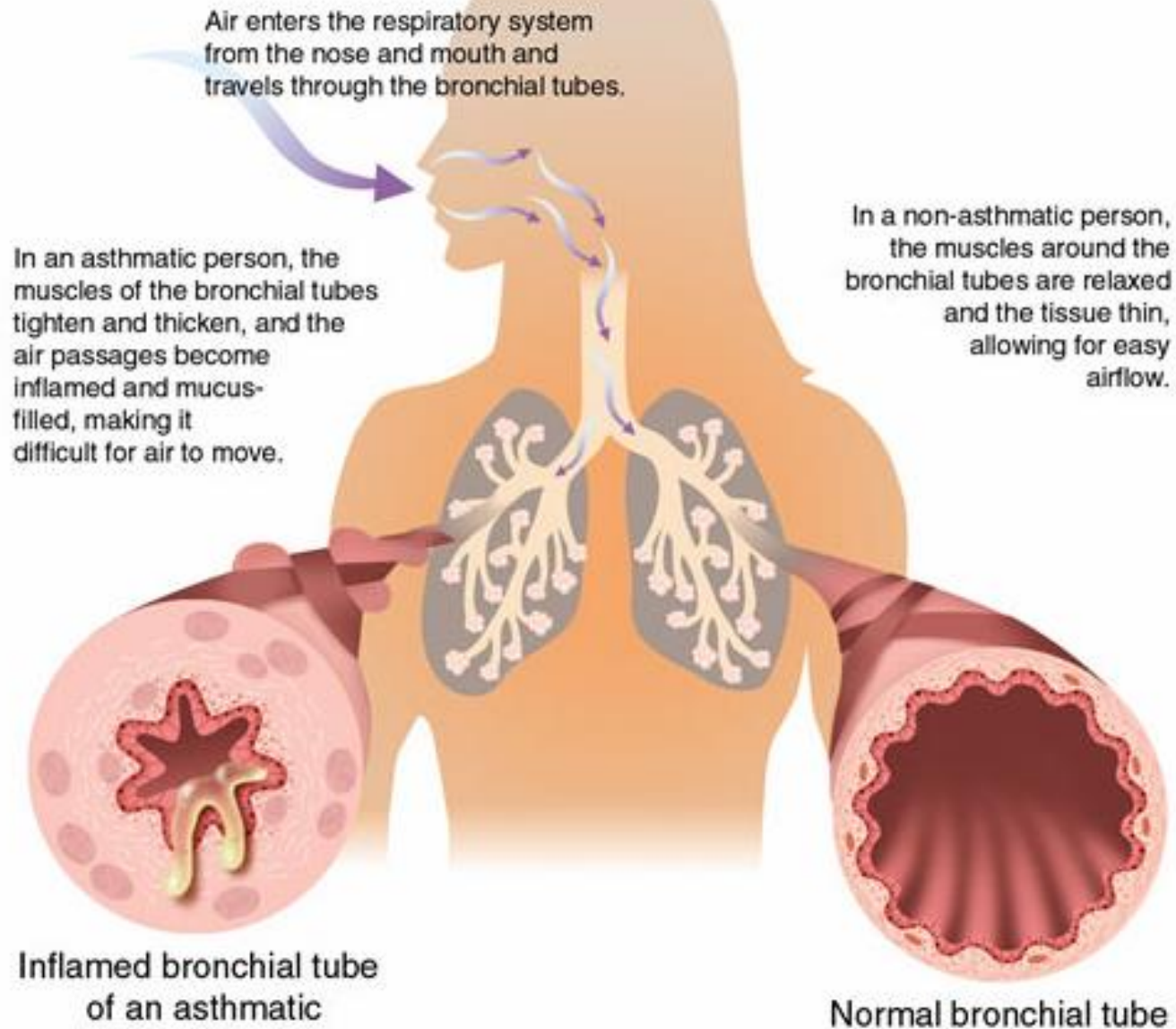
# Video – Brain Pop UK – Asthma

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<http://www.brainpop.co.uk/uk/psheandcitizenship/pshehealthandwellbeing/asthma/>



# Why asthma makes it hard to breathe



# Asthma

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Asthma affects the small airways (bronchioles) that carry air in and out of the lungs.

If you have asthma, the bronchioles can constrict rapidly and become narrow. They can also become inflamed and mucous filled, making it difficult for air to move through.

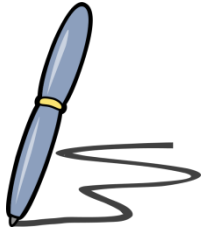
Symptoms of Asthma are:

- ▶ Wheezing
- ▶ Difficulty breathing
- ▶ Tight Chest.



# Asthma

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There can be many triggers for an asthma attack. Some of these are:

1. Dust mites
2. Pet hair
3. Cigarette smoke
4. Pollen
5. Air pollution
6. Exercise
7. Allergies.



<b>Chemical</b>	<b>Effect on Body</b>
Tar	Tar coats the surface of the breathing tubes and the alveoli. Tar causes cancer of the throat, mouth and lungs.
Nicotine	Nicotine is the chemical that causes smoking to be addictive. It also increases the heart rate, and blood pressure.
Carbon Monoxide.	This gas takes the place of oxygen in red blood cells. This reduces the amount of oxygen that can be carried in the blood.
Smoke	Hot smoke can damage cilia present on the lining of the breathing tubes. Mucus cannot be moved out of lungs.

