

The Breathing System





Learning Intentions

1. Students should Know how Breathing happens
2. Name and know the functions of the Breathing System
3. Know how the organs work and how they work with other systems



Why do we breath?

- Think 1 min
- Discuss 2 min
- Report



Things to help you answer the Q



**Try and complete the cloze test
using the words below:**

Breathing ; Food; Energy ; Oxygen

During respiration _____ reacts with oxygen to
release energy

_____ gets this oxygen into our bodies.

During respiration waste products are made

_____ gets rid of these.

_____ + Glucose  CO₂ + Water + _____

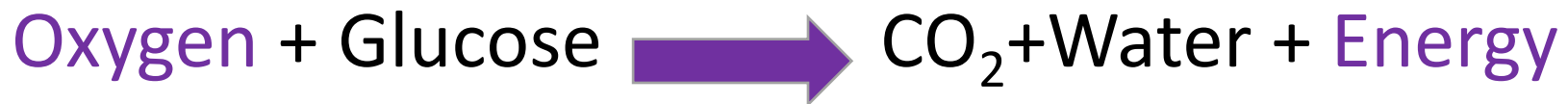
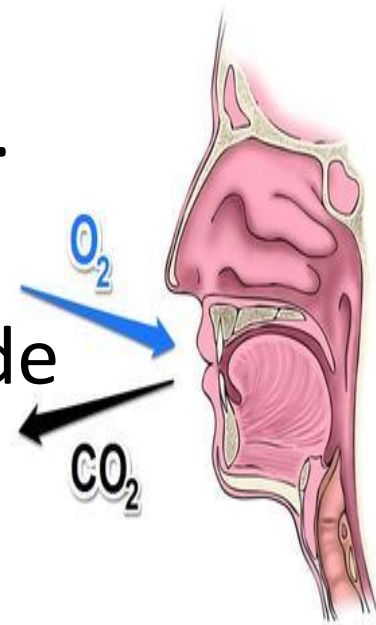
Why we need to breath

During respiration **food** reacts with oxygen to release energy

Breathing gets this oxygen into our bodies.

During respiration waste products are made

Breathing gets rid of these.





We breath
because we
need Air



Air contains
Oxygen

We use our Lungs
to get Oxygen into
our bodies



We eat because
we need food for
energy



There is a connection
between oxygen,
food and energy

Important words in this chapter

Respiration

Breathing

Trachea

Bronchus

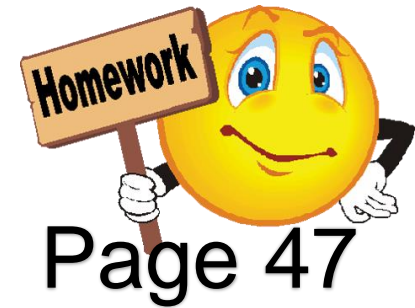
Bronchiole

Alveolus

Intercostal Muscles

Diaphragm

Thorax





The Breathing System

The Respiratory System

Living Things





Living Things



Living Things

Living Things



All Breath

**All have a Respiratory
System**

All get energy from food

The Food Pyramid

For adults, teenagers and children aged five and over

Not needed for good health.

Foods and drinks high in fat, sugar and salt



NOT every day



Maximum once or twice a week

Fats, spreads and oils



In very small amounts

Meat, poultry, fish, eggs, beans and nuts



2 Servings a day

Milk, yogurt and cheese



3 Servings a day

5 for children age 9-12 and teenagers age 13-18

Wholemeal cereals and breads, potatoes, pasta and rice



3-5* Servings a day

Up to 7* for teenage boys and men age 19-50

Vegetables, salad and fruit



5-7 Servings a day

Needed for good health. Enjoy a variety every day.

*Daily Servings Guide - wholemeal cereals and breads, potatoes, pasta and rice

Active	Child (5-10)	Teenager (11-18)	Adult (19-50)	Adult (51+)	Inactive	Teenager (11-18)	Adult (19-50)	Adult (51+)
		3-4	4	4-5		3-4		3
	3-5	5-7	5-7	4-5		4-5	4-6	4

There is no guideline for inactive children as it is essential that all children are active.

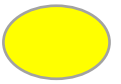


Drink at least 8 cups of fluid a day - water is best



Get Active!

To maintain a healthy weight adults need at least 30 minutes a day of moderate activity on 5 days a week (or 150 minutes a week); children need to be active at a moderate to vigorous level for at least 60 minutes every day.



Cellular Respiration

Cellular Respiration is the release of energy from food and it takes place in the cells of living things

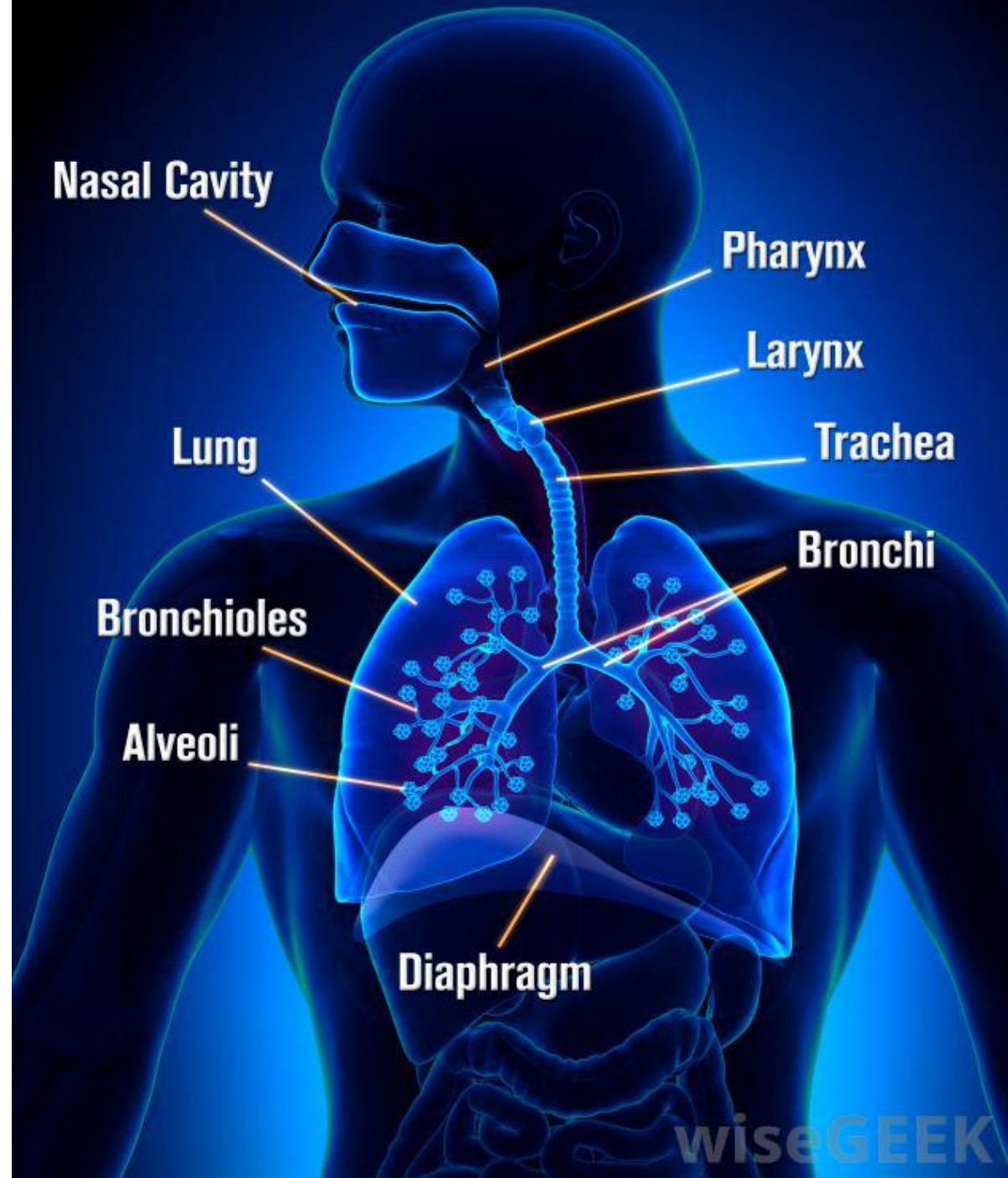
The Breathing System
The Respiratory System

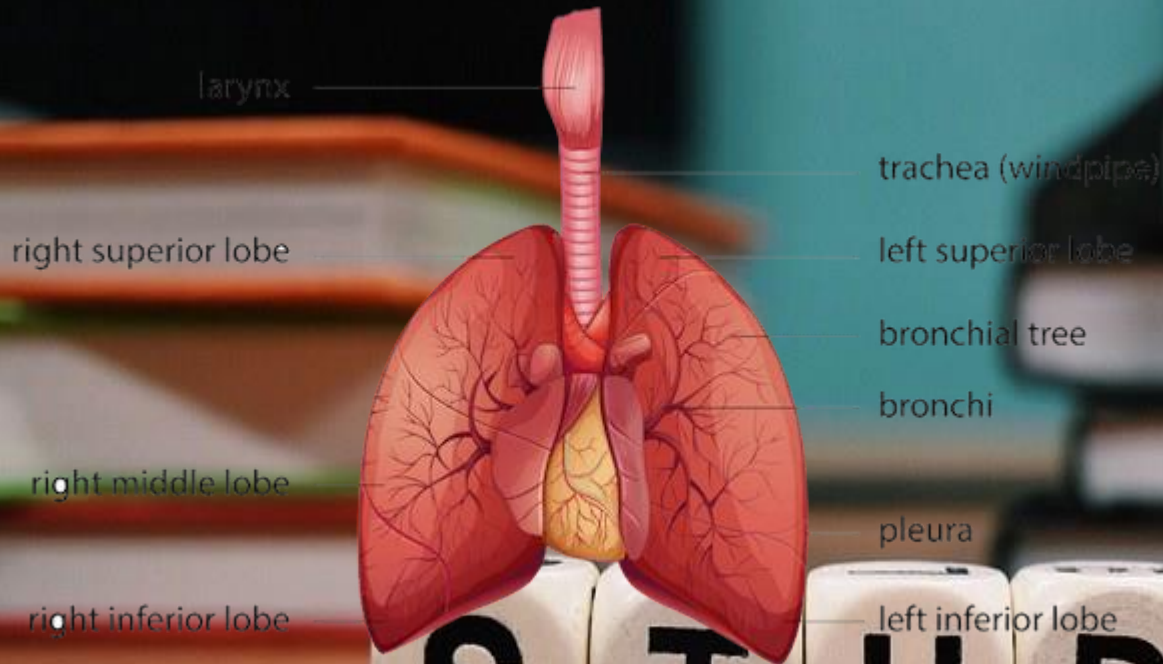
and

Cellular Respiration

Breathing System

Respiratory System



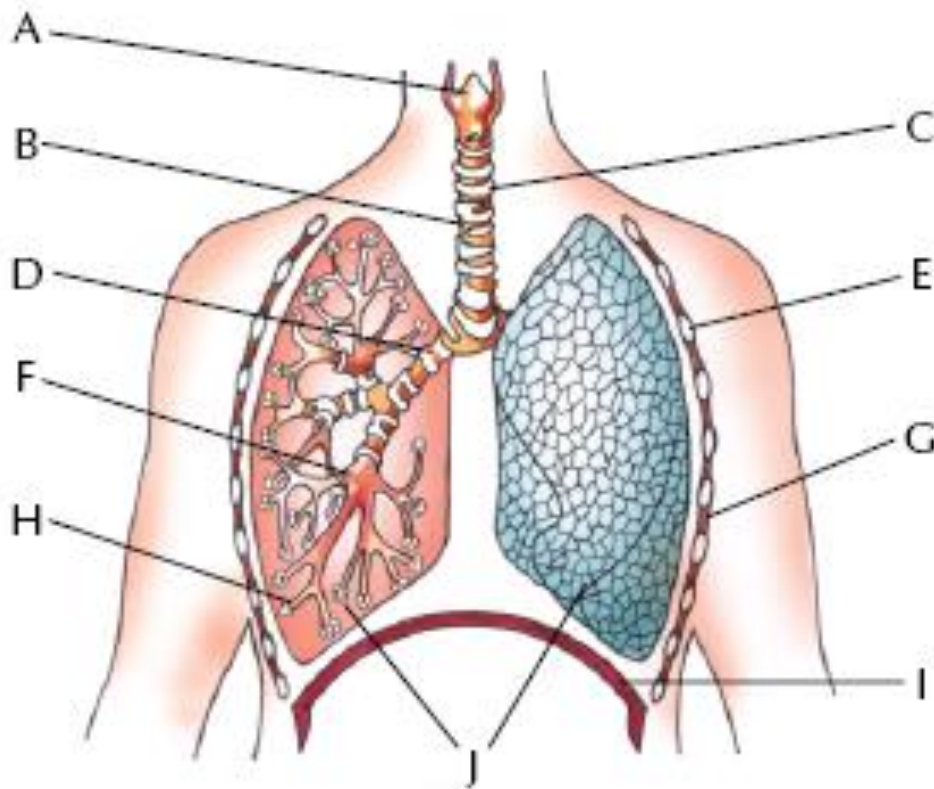


S T U D Y

10 mins

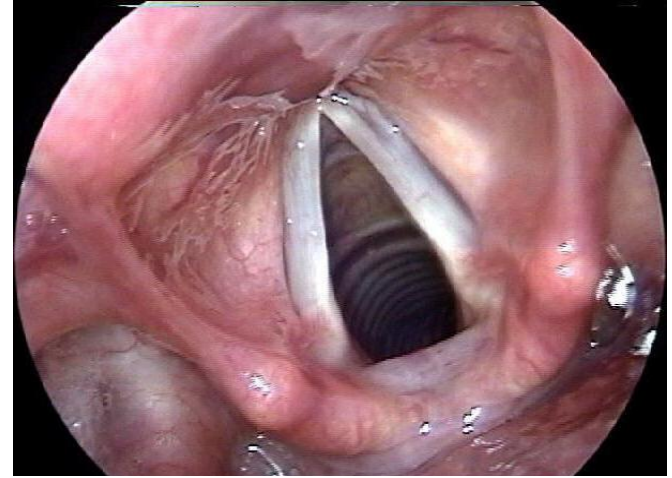
**Time for some
self directed Study**

Draw a labelled diagram of the Breathing System and comment on the function of each part

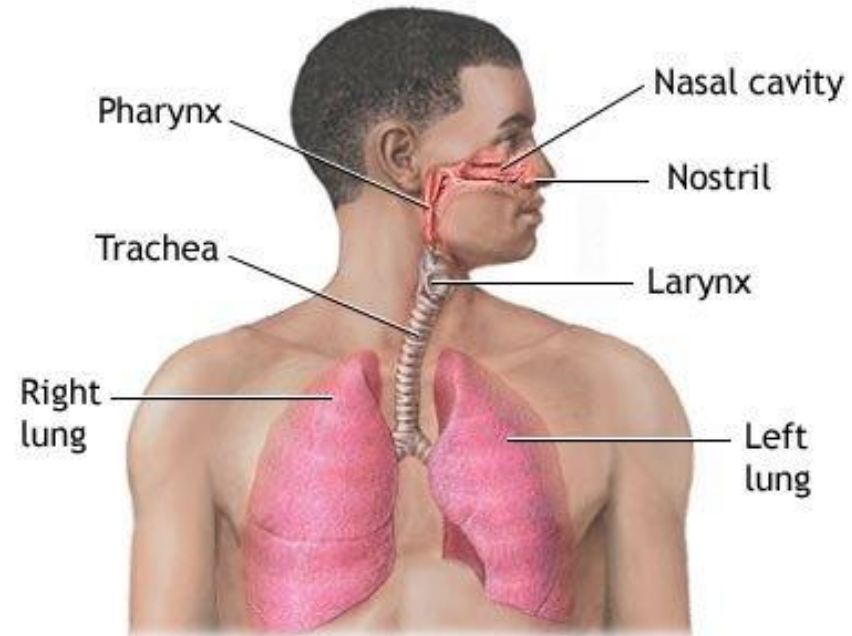


The parts of the breathing System

The Larynx (*Voice box*)
Vocal chords – sound.



The Trachea (*Windpipe*)
Carries air to lung
Kept opened by
cartilage rings



The parts of the breathing System

The Lungs

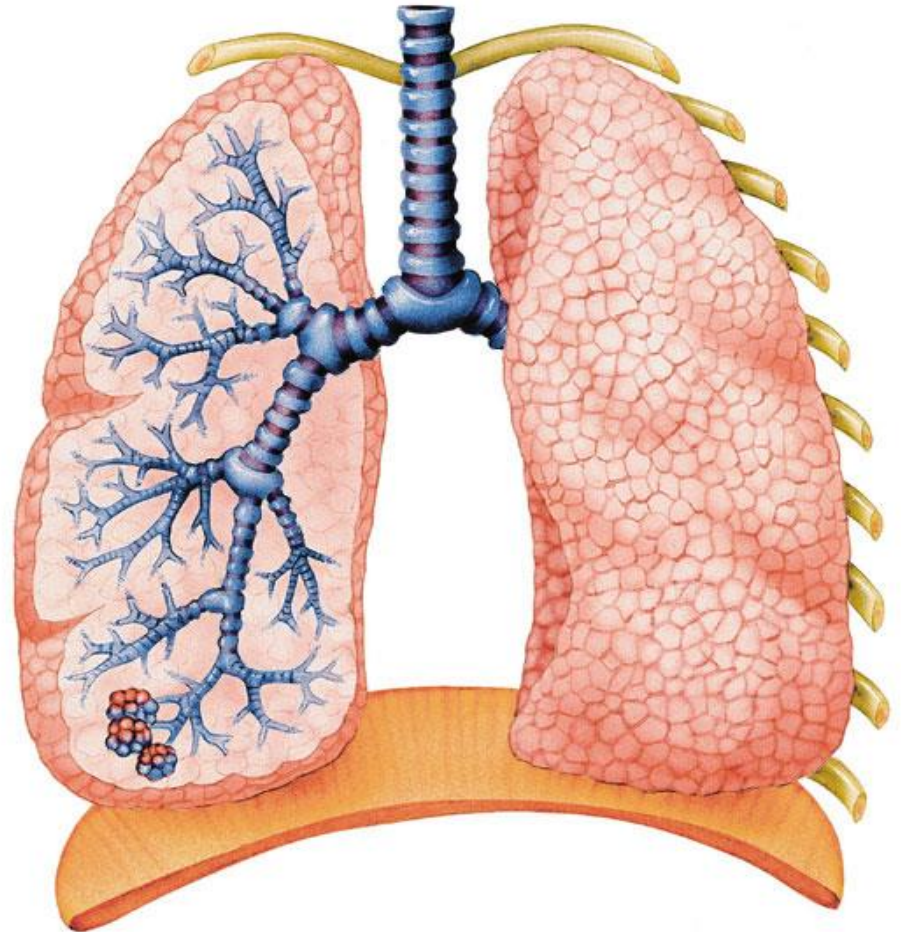
Left & Right

Spongy expandable
tissue

The Bronchi

The trachea branches
into two bronchus

Carry air to the lungs



The parts of the breathing System

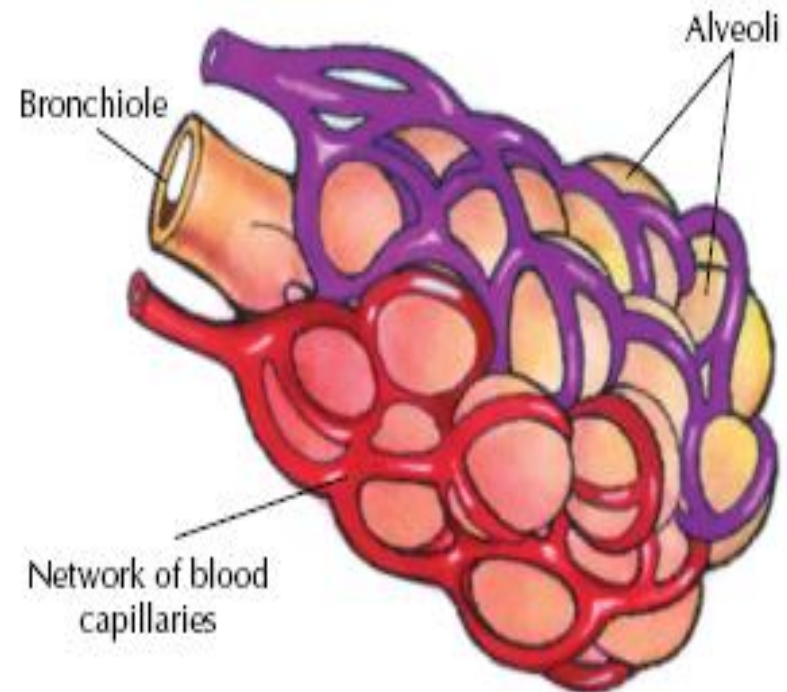


The Bronchioles

Inside the lung bronchi divide into many bronchioles

The Alveoli

Bronchiole end in a bunch of small air cells called Alveoli (*air sacs*)

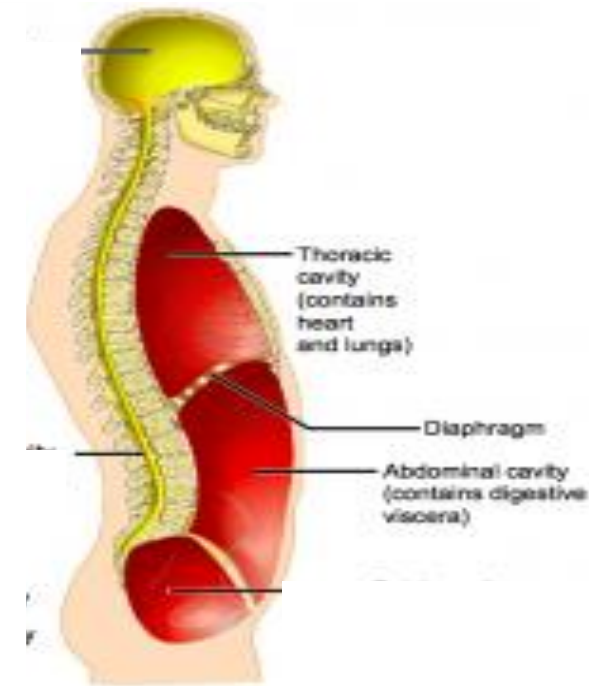


The parts of the breathing System



The Diaphragm

Thin Sheet of Muscle separates chest cavity (thorax) from abdomen

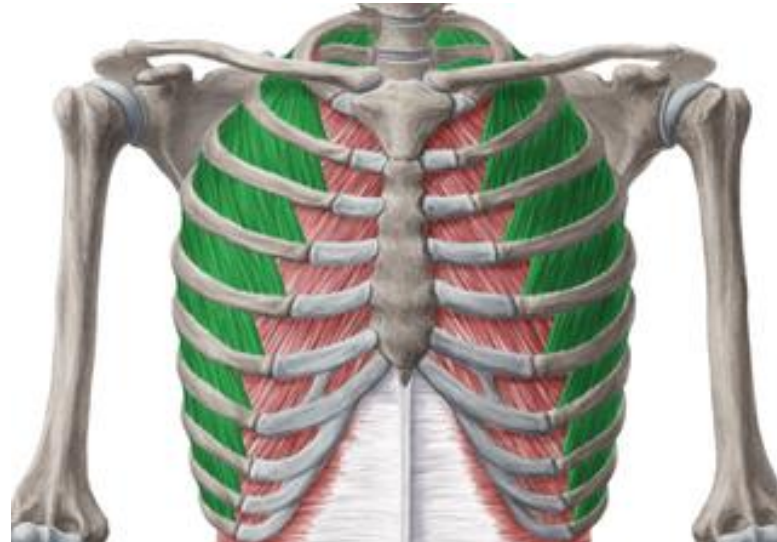


The Rib Cage

12 pairs

The Intercostal Muscles

between the ribs



Taking a Breath



Inhalation

- ▶ Brain to send a message to the diaphragm & intercostal muscles.
- ▶ Diaphragm pulls downwards
- ▶ Rib cage expands
- ▶ Air rushes into the lungs

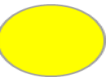
Exhalation

- ▶ Brain sends a message to the diaphragm & intercostal muscles.
- ▶ Diaphragm pushes upwards
- ▶ Rib cage presses inwards
- ▶ Air rushes out of the lungs

MECHANICS OF BREATHING



What happens during breathing?



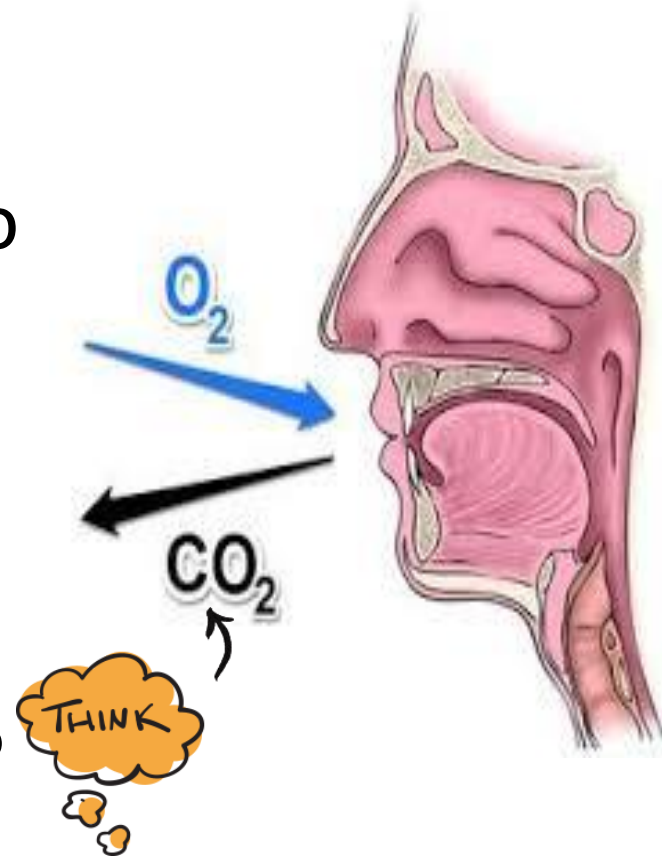
Air goes into lungs

Oxygen goes from the lungs into the blood

CO₂ and **H₂O** goes from blood into the lungs

Air is breathed out

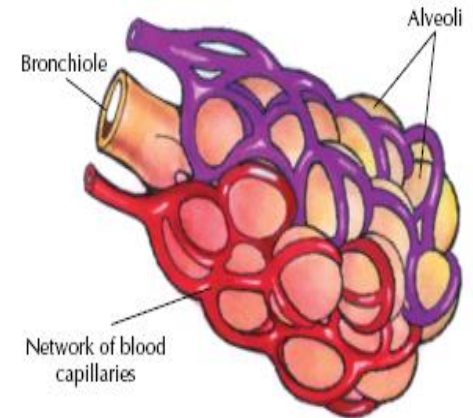
What will be the differences between inhaled and exhaled air ?



Gaseous Exchange



- Each Alveolus is covered in a network of blood vessels (**capillaries**)
- Capillary walls are very thin
- Oxygen moves from the alveolus into the capillary
- CO₂ moves from the capillary into the alveolus
- The exchange occurs by **diffusion**



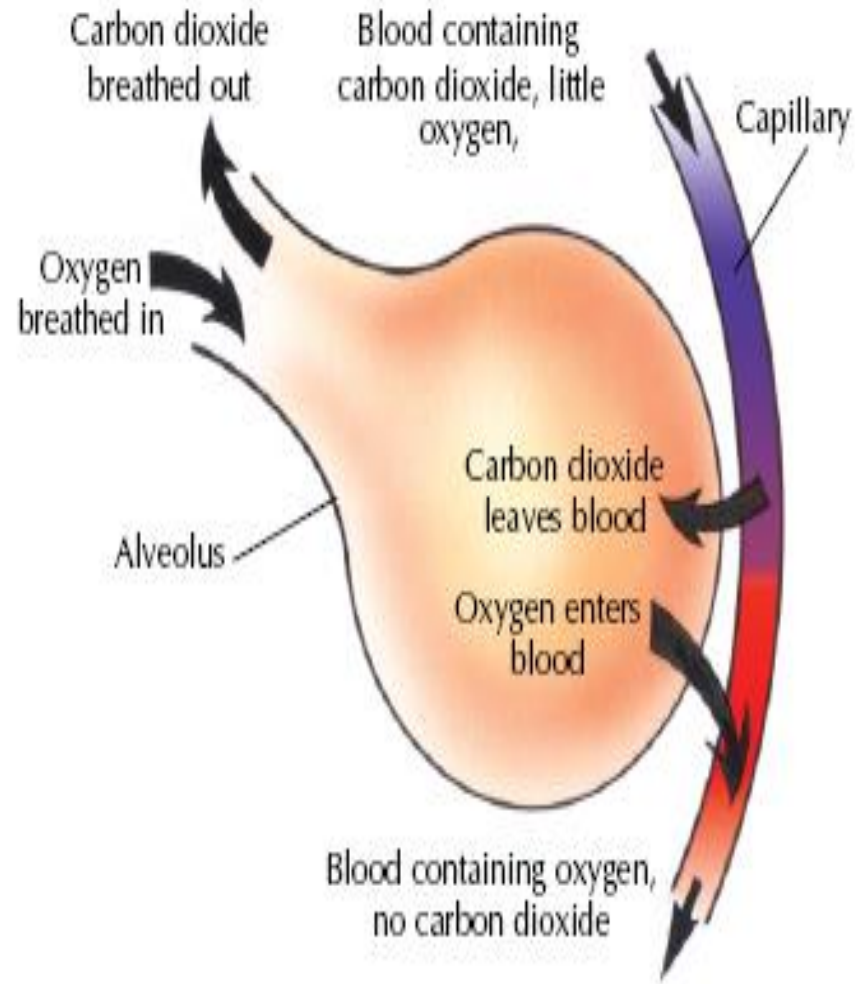
Gaseous Exchange

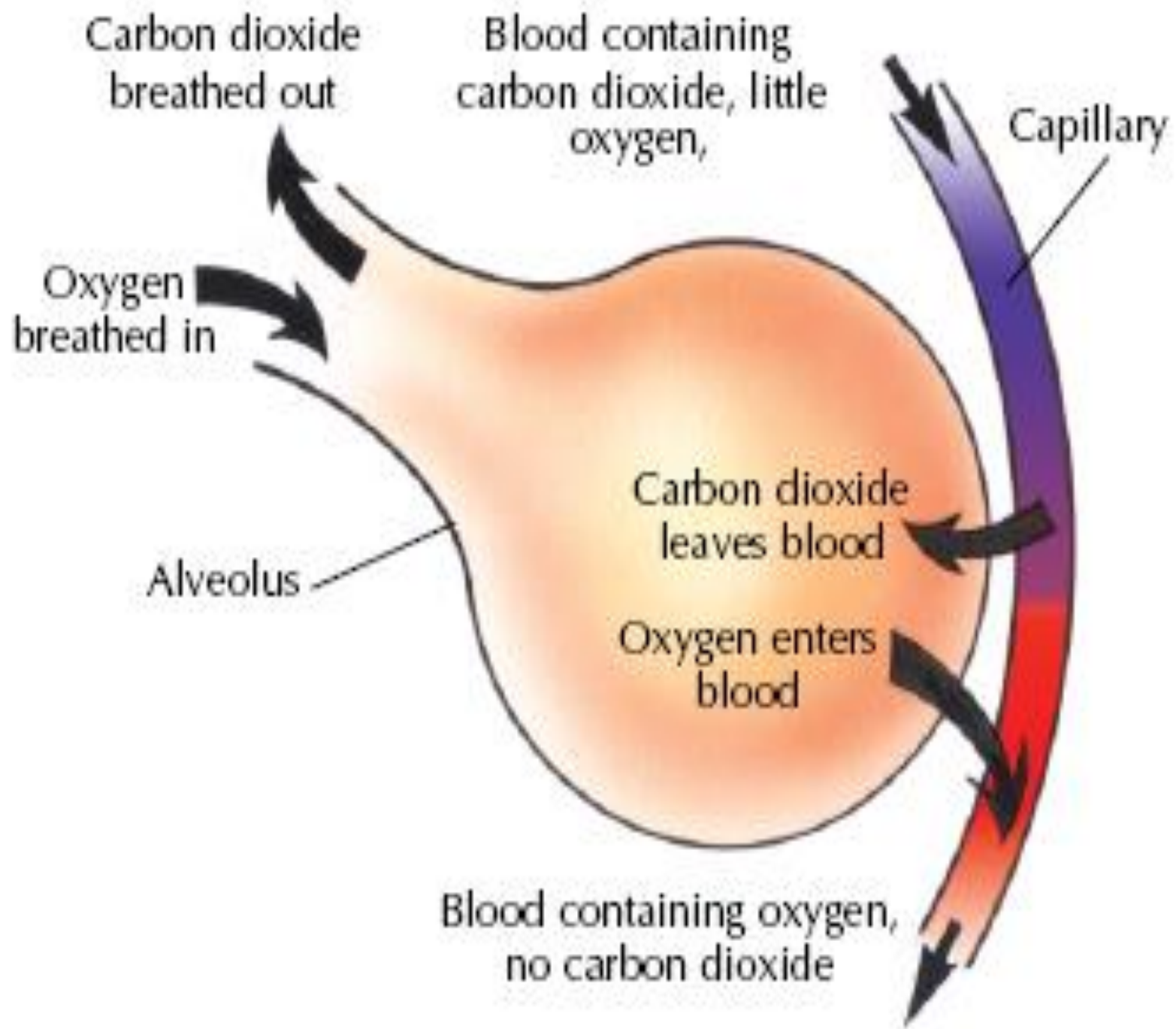
The air we breath in has 21% Oxygen

We keep about 5% and breath out 16%

The Oxygen we keep enters the blood stream by diffusion

And CO₂ leaves the blood and enters the alveolus in exchange





Component	Inhaled air	Exhaled air	Reasons
Oxygen	21 %	16 %	?
Carbon dioxide	0.03 %	4 %	?
Nitrogen	78 %	78%	?
Water vapour	Variable	Saturated	?
Other gases	1 %	1 %	?
Temperature	variable	37°C	?

Once upon a time...tell the story of an oxygen atom from it is inhaled into someone's body until it is exhaled as part of a carbon dioxide molecule.



Smoking & Health

Tar – smokers cough -
bronchitis

Nicotine – addictive – damages
heart/lungs

Carbon monoxide replaces
oxygen- unfit

Smoking stunts a babies growth
in the womb

LUNG CANCER

Smoker's lungs



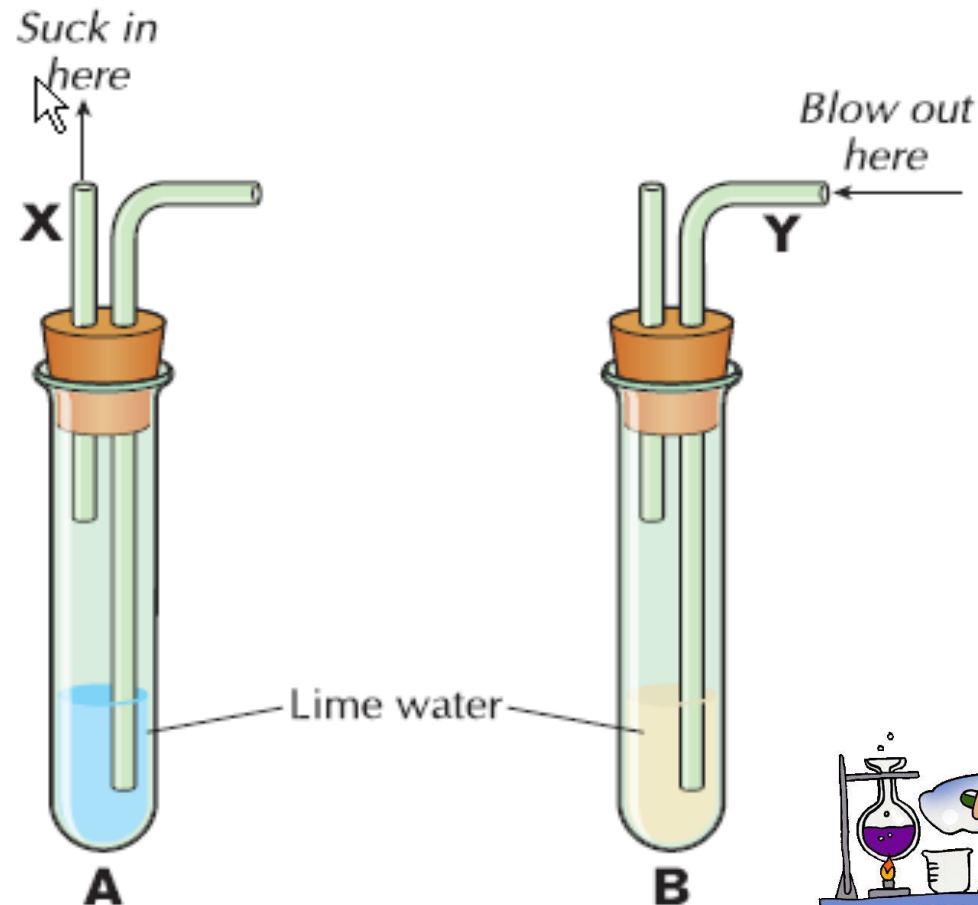
Non-smoker's lungs

Passive Smoking

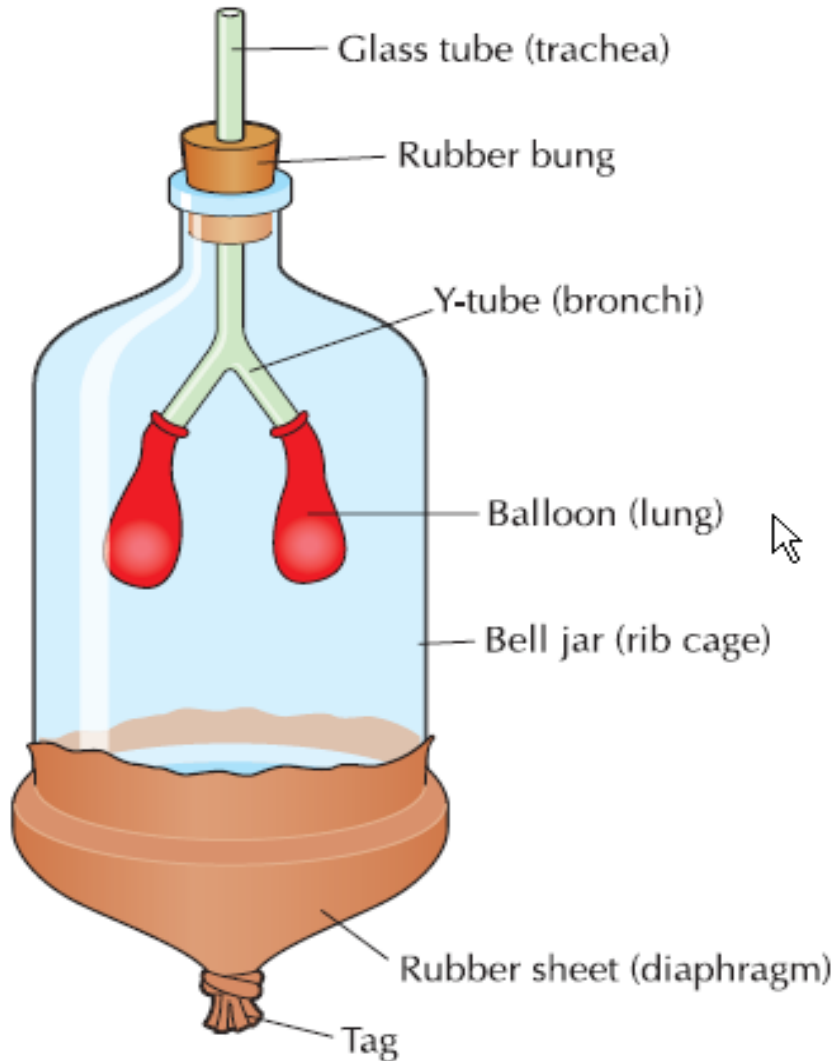
Breathing in the smoke from cigarette smokers



To compare the carbon dioxide levels of inhaled and exhaled air



TEAM TASK



What do you think will happen when the rubber sheet is pulled down

Explain the science behind your decision

Design an experiment to show the effect of exercise and rest on the breathing rate?



Read Chapter 6
of your textbook
about the
Respiratory
System

