2/9

HW

Day 4

Complete Current Events Summary

Aim: What is respiration?

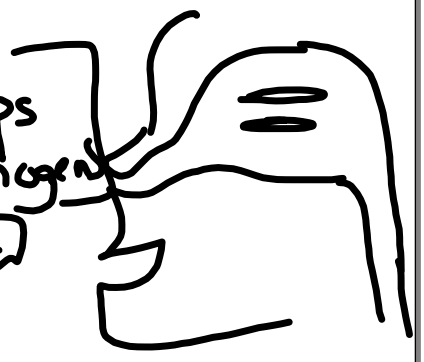
Do Now: What is the function of the nasal cavity?

① Air goes into nostrils & then to nasal cavity

A. filter [mucus traps dust & pathogens]

B. Moistens [mucus] [hairs, cilia]

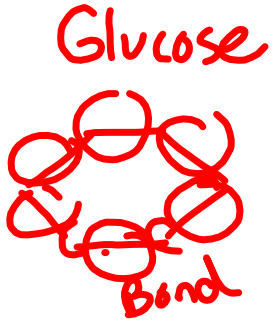
C. Warm the air



Aim: What is respiration?

What is respiration?

- The way in which organisms release energy(ATP) from glucose (food)



What are the 2 types of respiration?

- aerobic-

needs oxygen and releases a lot of ATP molecules(36) per 1 glucose molecule (mitochria)

- anaerobic-

needs NO oxygen and releases a small amount of ATP molecules(2) per 1 glucose molecule cytoplasm

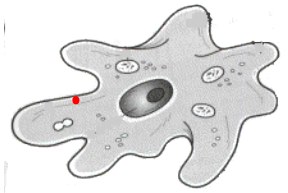
Feb 1-3:46 PM

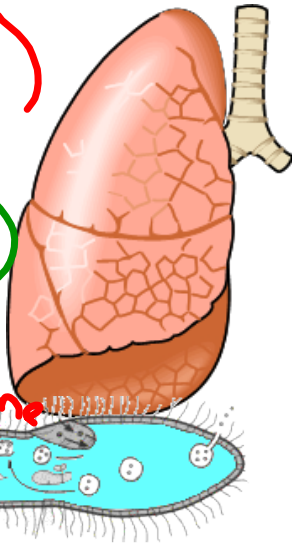
How do organisms exchange gases with their environment?

Protists: (Aerobic resp)

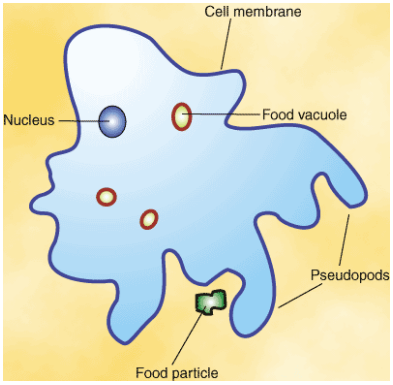
O_2 CO_2

Diffusion through cell membrane

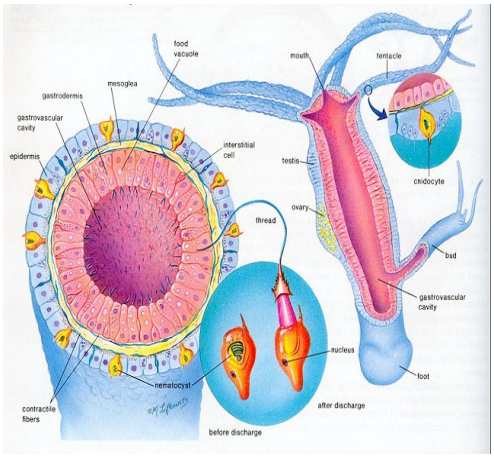


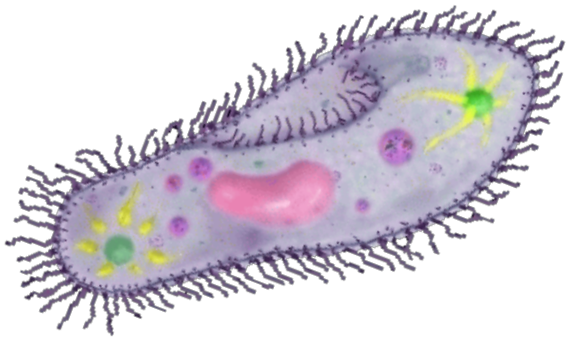


How do these organisms exchange gases with their environment?



Protists





Cnidaria (Hydra)

O_2 diffuses into cells & CO_2 diffuse out

How do Fish get their oxygen?

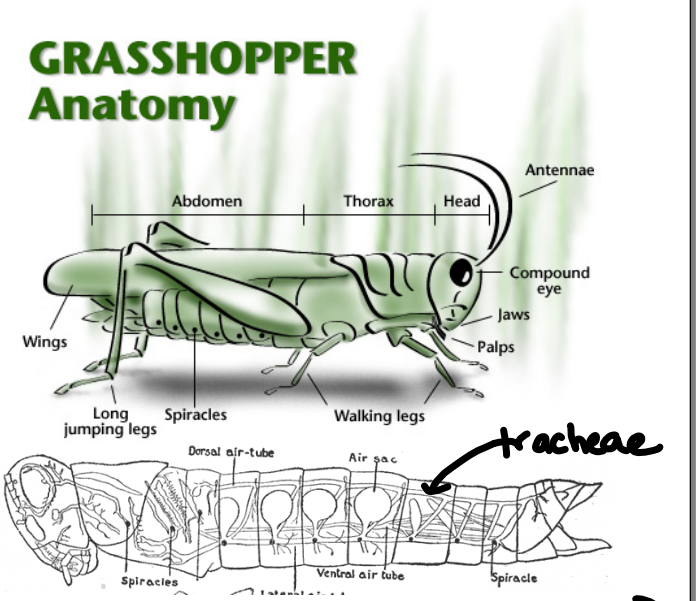
Gills

O_2 diffuses from H_2O into capillaries in gills.

CO_2 diff. out of capillaries into H_2O

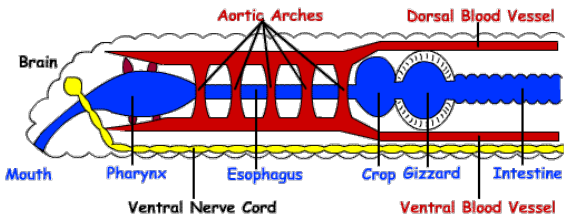
* Counter Current exchange allows this exchange to be efficient

How do insects get their Oxygen?

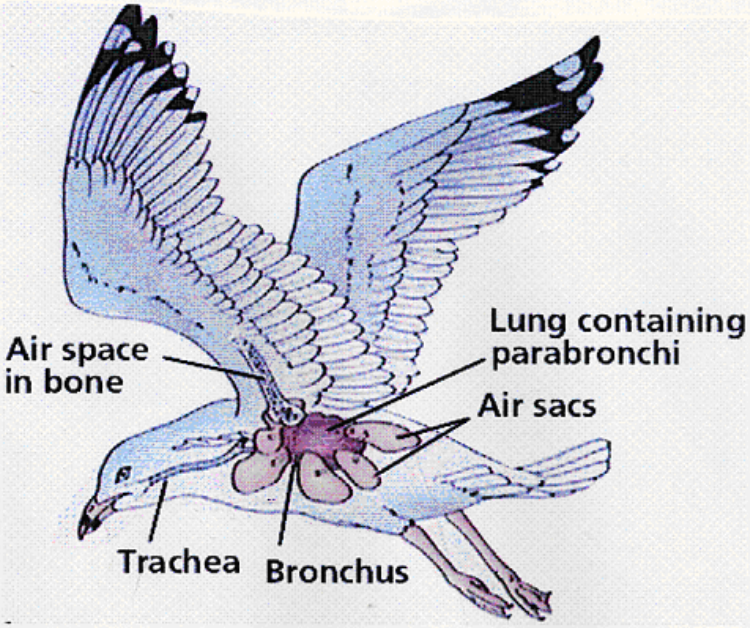


spiracles opening of that allow air in & out. Tracheae carry gases to the cell-where diff. takes place

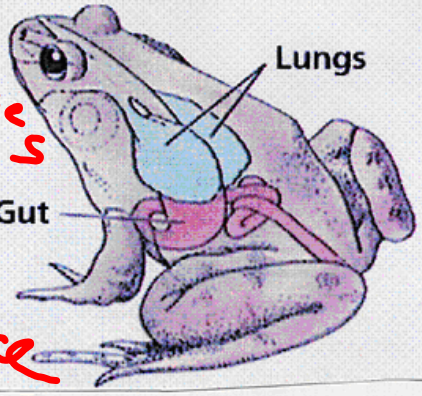
How does the earthworm get O_2?



Gas exchange occurs at the skin. O_2 enters through the moist skin. & CO_2 leaves through the skin



Amphibian lungs are ventral outpocketings of the gut, though they lie dorsal to it



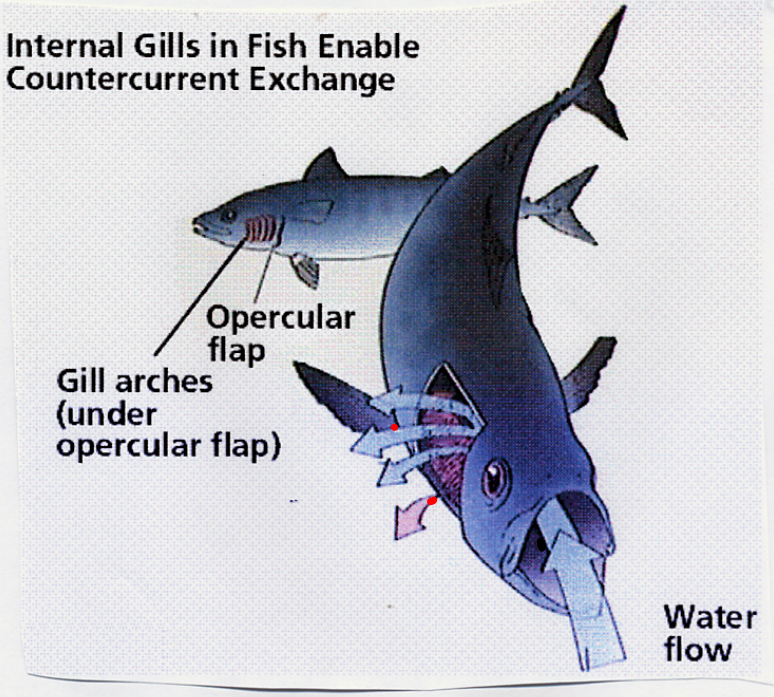
Resp Surface
1) rich in capillaries (thin)
2) Moist Surface
3) Large Surface area

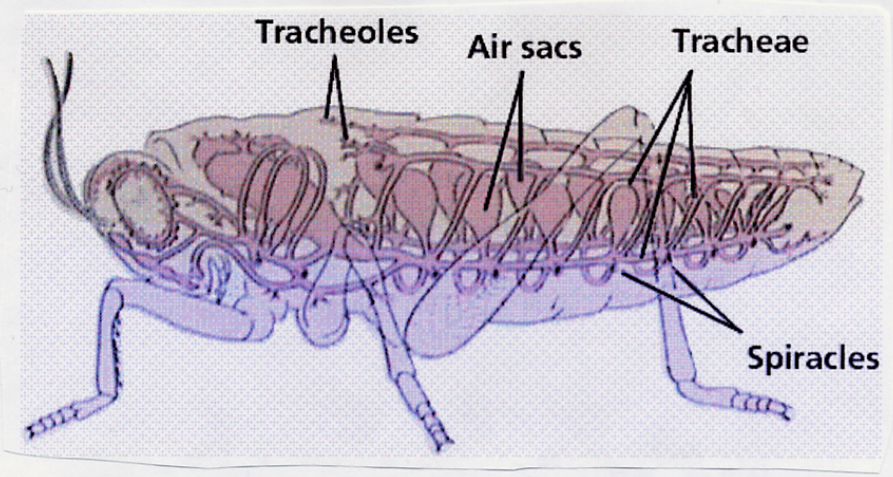
Lungs: diffusion of O_2 into blood & CO_2 out

Skin also used for gas exchange

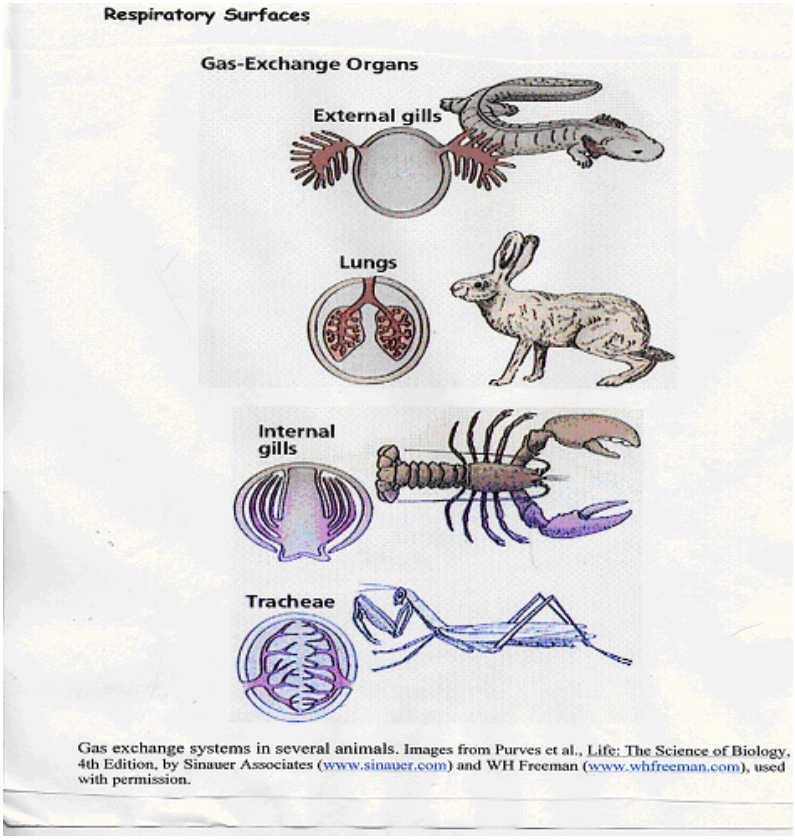
Respiratory System Principles

1. Movement of an oxygen-containing medium so it contacts a moist membrane overlying blood vessels.
2. Diffusion of oxygen from the medium into the blood.
3. Transport of oxygen to the tissues and cells of the body.
4. Diffusion of oxygen from the blood into cells.
5. Carbon dioxide follows a reverse path.


Internal Gills in Fish Enable Countercurrent Exchange
Opercular flap
Gill arches (under opercular flap)
Water flow


Tracheoles
Air sacs
Tracheae
Spiracles

Jan 29-5:35 PM

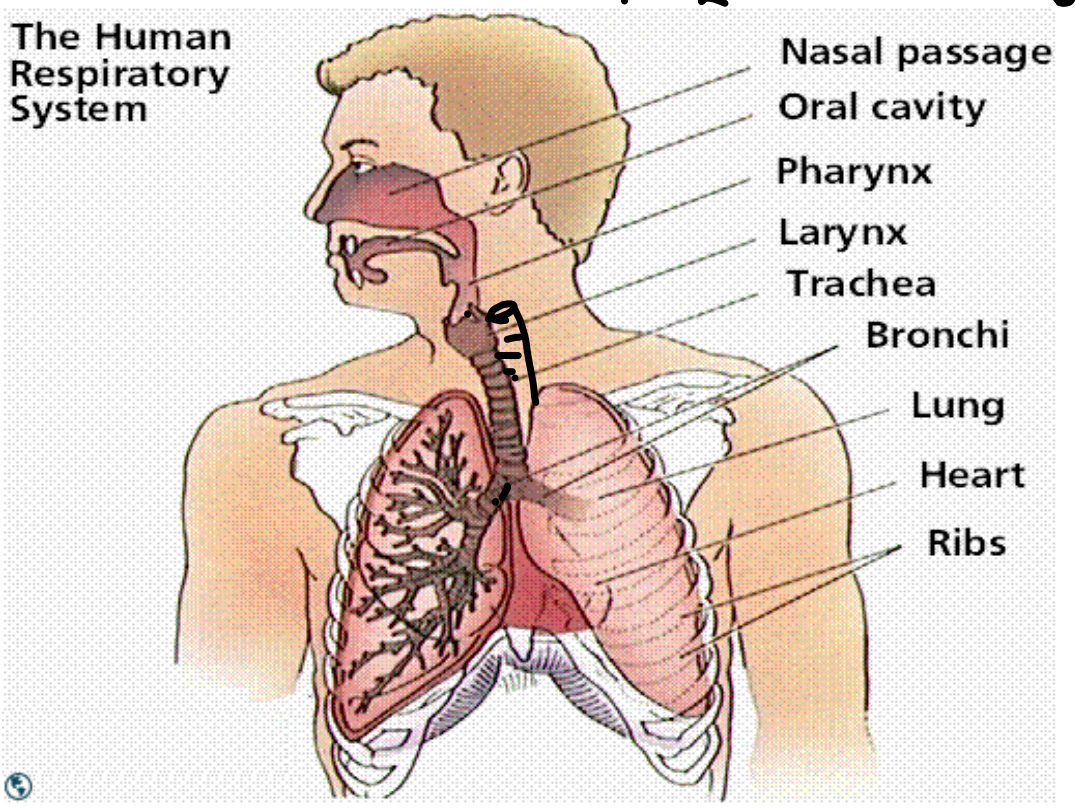


Gas exchange systems in several animals. Images from Purves et al., Life: The Science of Biology, 4th Edition, by Sinauer Associates (www.sinauer.com) and WH Freeman (www.whfreeman.com), used with permission.

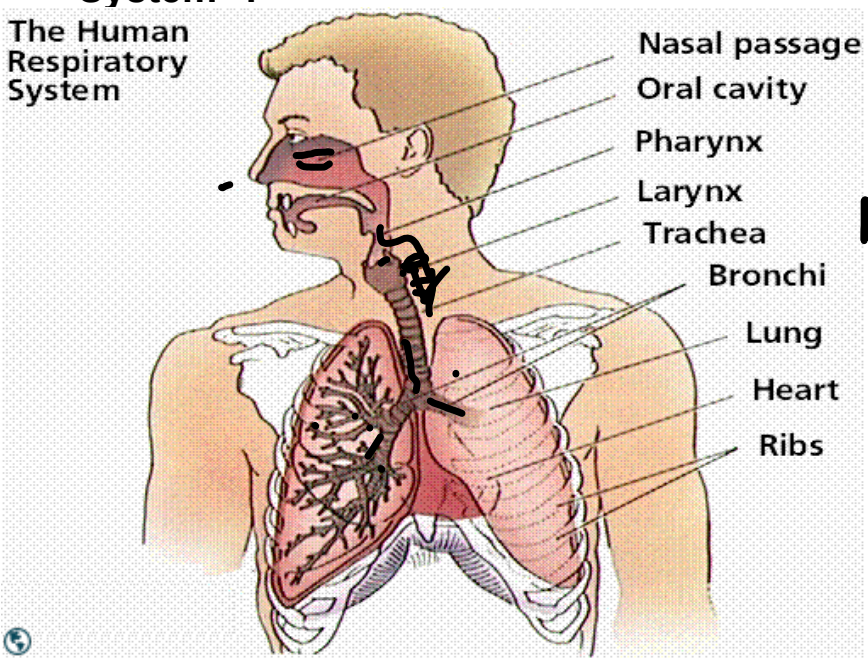
What is the function of the Human Respiratory System?**

To get oxygen to the circulatory system which then carries it to the body cells where the mitochondria use it for aerobic respiration

& CO_2 is released from the body



What are the Structures and Functions of the Respiratory System ?



Flow Chart

Nose → Nasal Cavity

Mouth

→ Pharynx [throat]

→ Larynx [Voicebox] vocal cords

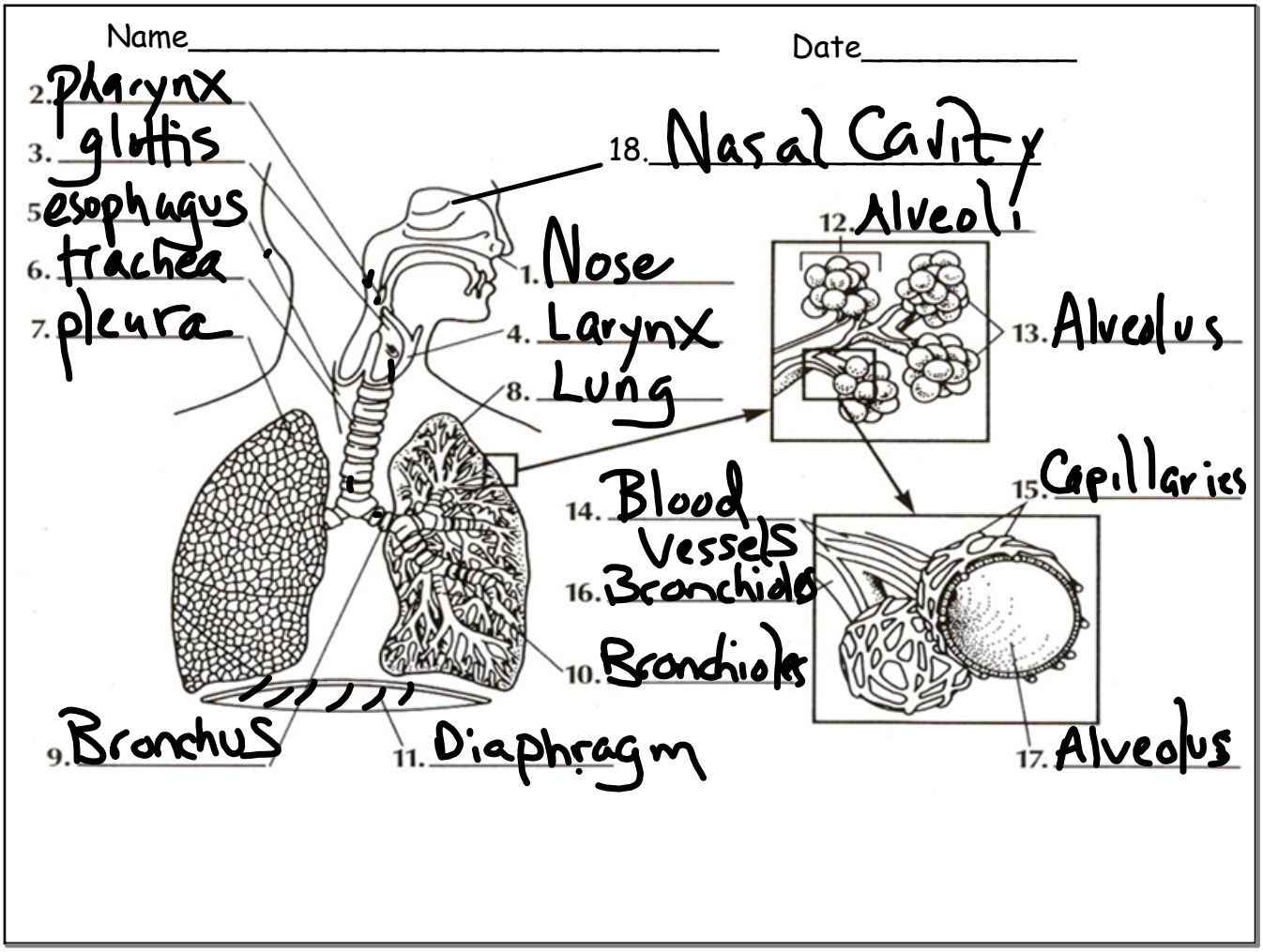
→ trachea (wind pipe)

→ Bronchus → Bronchioles → alveoli

→ Bronchus → Bronchiole → alveoli

Hair Sacs many

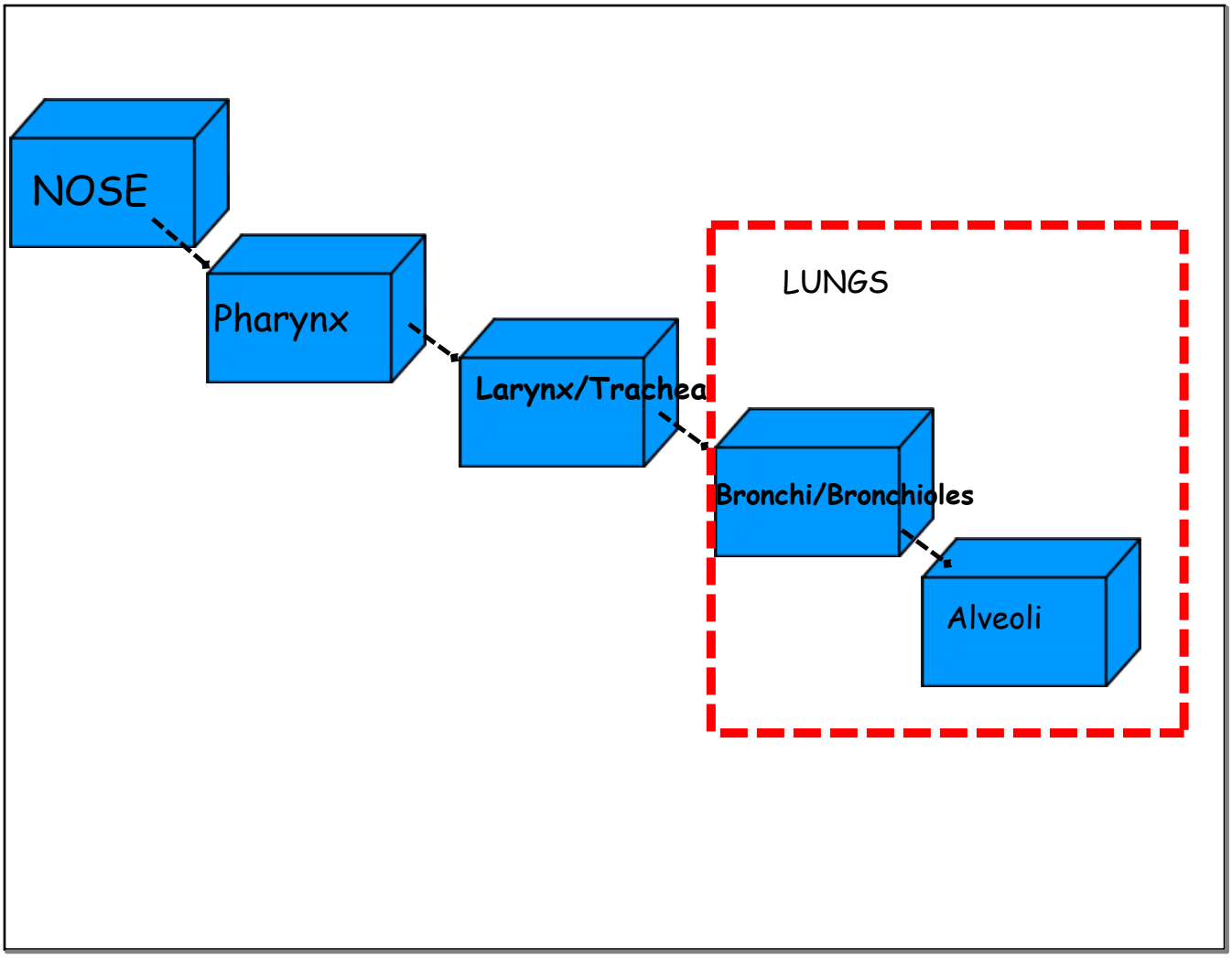
many


Name_____ Date_____
2. Pharynx
3. glottis
5 esophagus
6. trachea
7. pleura
18. Nasal Cavity
12. Alveoli
1. Nose
4. Larynx
8. Lung
13. Alveolus
15. Capillaries
14. Blood Vessels
16. Bronchiole
10. Bronchiole
9. Bronchus
11. Diaphragm
17. Alveolus

Feb 12-8:59 AM

Respiratory Structure	Function
Nose	Filters, warms up, moistens the air coming in
mouth	air enters
Pharynx	tube that connects to trachea & esophagus
epiglottis	flap of tissue that helps prevent choking
Larynx	voice box contains vocal cords → sound
Trachea * Cartilage rings for support	tube that connects the pharynx to the Bronchi [which enters the Lung] [Lined with cilia]
Bronchi (bronchus) * Lungs * cartilage rings	2 Tubes that connect the trachea to the Bronchioles
• Bronchioles	smaller & smaller tubes that connect the Bronchi to the alveoli
Alveoli [alveolus]	microscopic air sacs connected to the bronchioles • thin-walled & allow for gas exchange • O_2 diffuses into blood & CO_2 diffuses into Alveolus
Diaphragm	Muscle that allows for breathing

Jan 13-1:28 PM

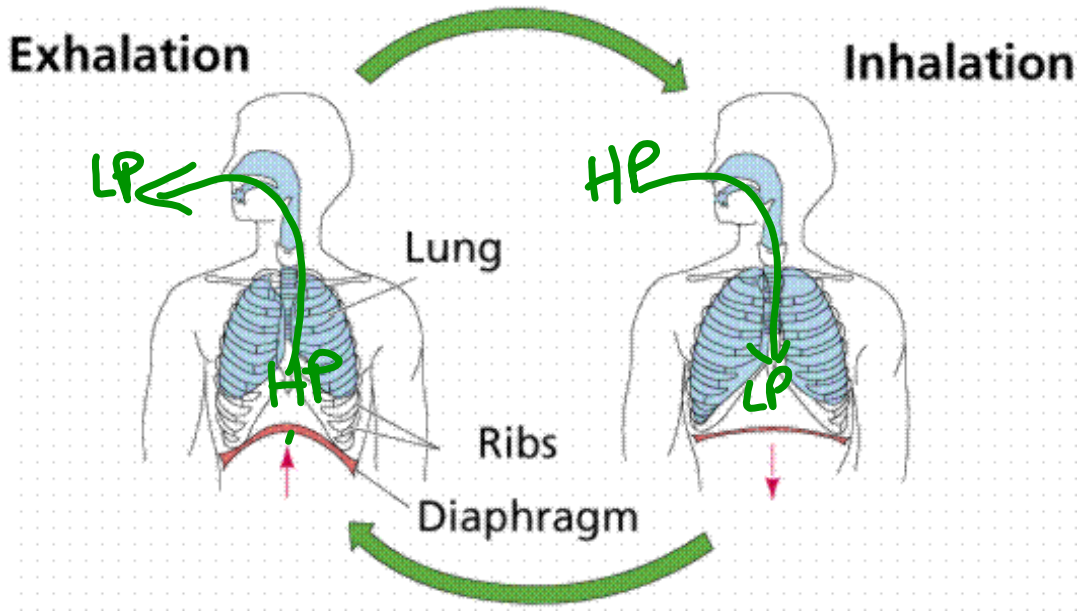

NOSE
Pharynx
Larynx/Trachea
LUNGS
Bronchi/Bronchioles
Alveoli

Feb 1 - 7:31 PM

Breathing-- The process in which air enters and exits the lungs.

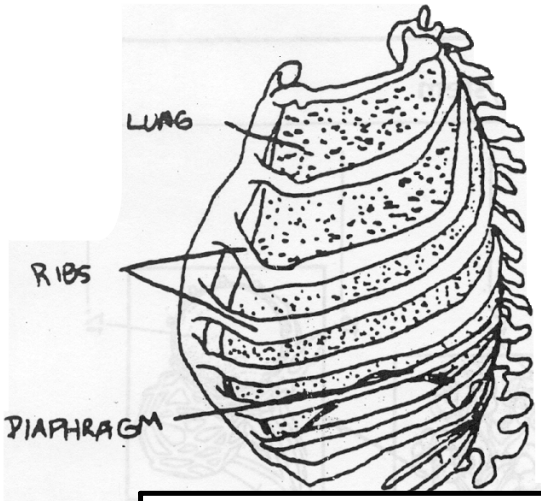
Inhalation

Exhalation



Jan 29-5:42 PM

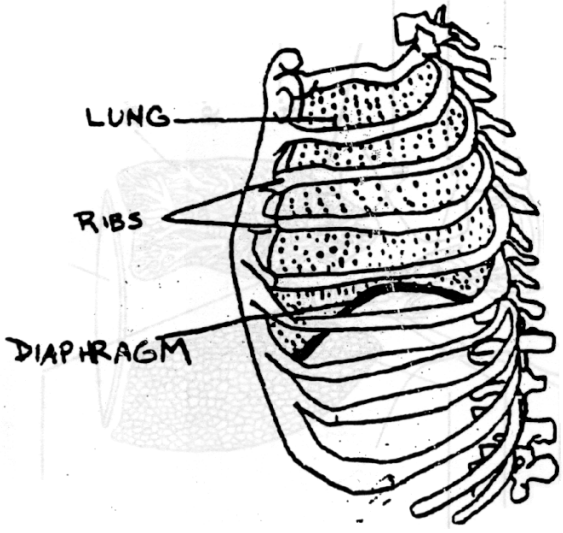
Breathing



Inhalation Side view

1. Diaphragm moves down
   Ribs move up and out
2. Amt of space ↑
3. Pressure ↓
4. Air moves in

HP->LP
out → in



Exhalation side view

1. Diaphragm moves Upward
   Ribs move in & down
2. Space decreases
3. Pressure ↑
4. air moves out

HP→ LP
inside outside

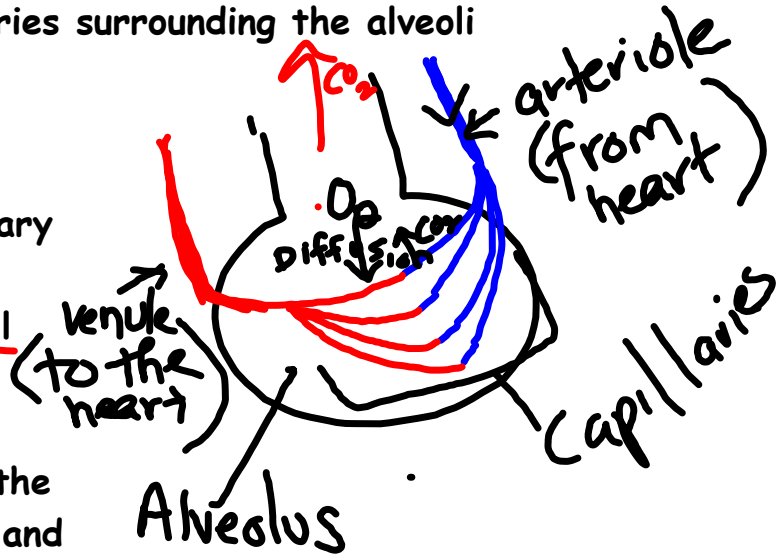
Gas Exchange-

the movement of O_2 into the blood and the movement of CO_2 out of the blood. (at the alveoli)

[diffusion / absorption]

Where does it take place?

the alveoli and the capillaries surrounding the alveoli



-Oxygen enters the capillary from the alveoli

• enters the red blood cell as oxyhemoglobin

-Carbon dioxide found in the blood leaves the capillary and enters the alveoli

What processis involved in the movement of O_2 and CO_2 in and out of the alveoli?

diffusion

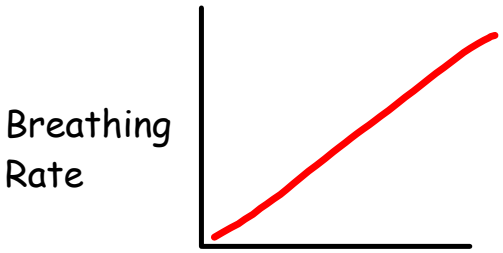
https://highered.mheducation.com/sites/9834092339/student_view0/cha
gas_exchange_during_respiration.html

Feb 1-3:58 PM

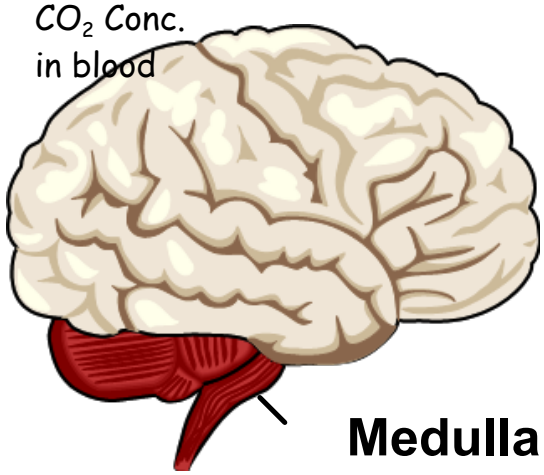
Breathing Rate-
the speed of breathing

What controls how fast we breathe?
- **there is a breathing center in the medulla of the brain**
- **When CO_2 level in the blood increases breathing rate increases**
- **When CO_2 level in the blood decreases breathing rate decreases**

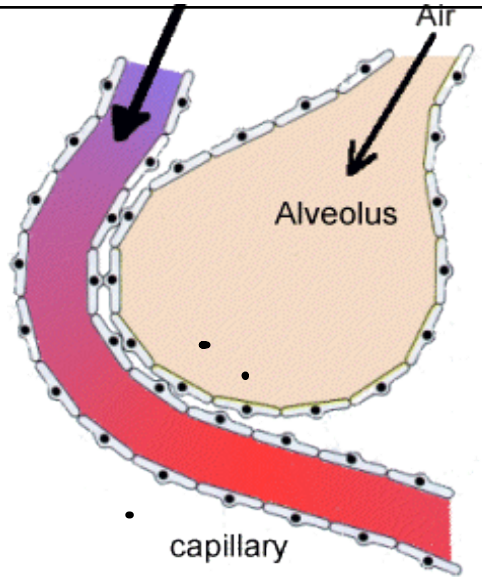
**Nerve impulses are sent to the muscles of the ribs and diaphragm that causes them to contrac



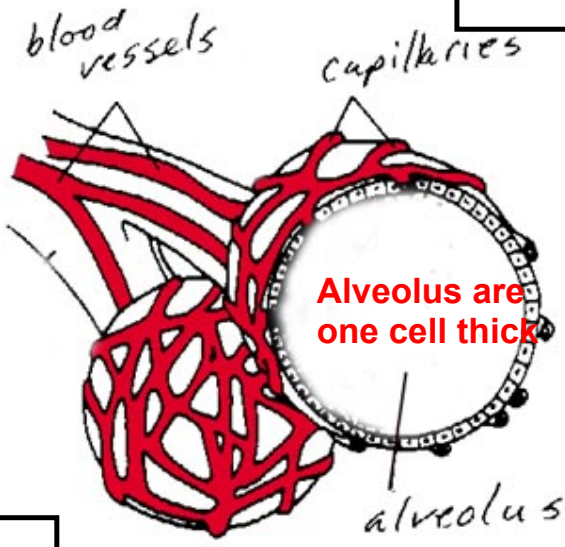
Direct Relationship



Medulla Oblongata



The Alveoli are the site of gas exchange for our Respiratory System



http://www.youtube.com/watch?v=mmpzIG9afJA&feature=related

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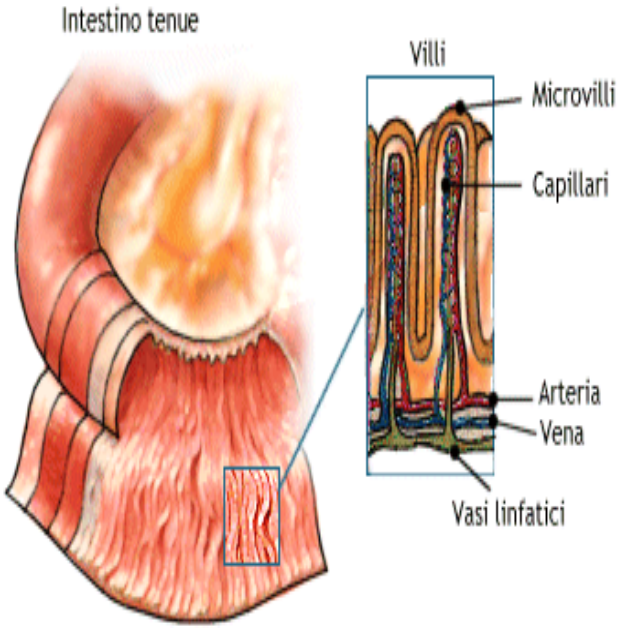
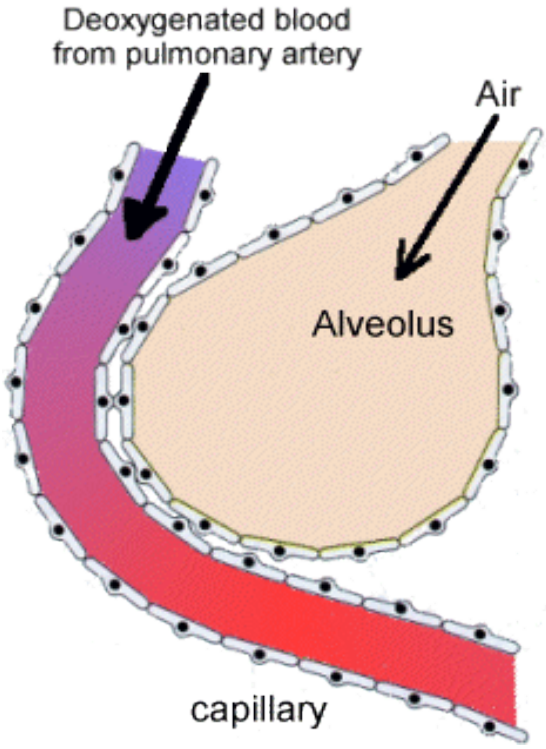
What do the villi of the small intestine and the alveoli of the lungs have in common?

Villi of the Small Intestine



LUNGS

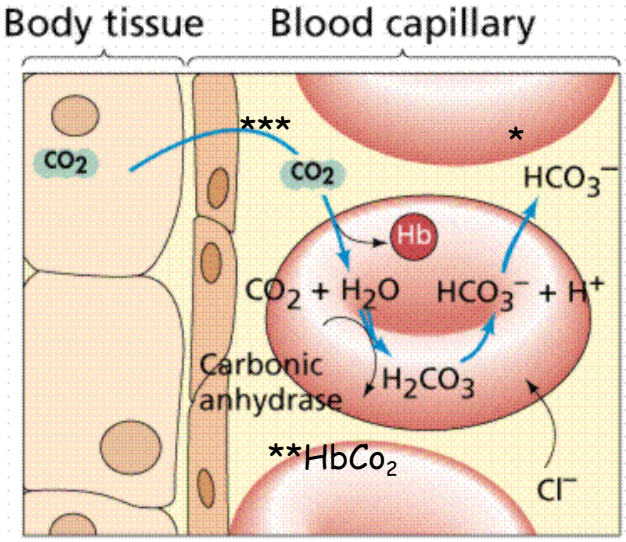


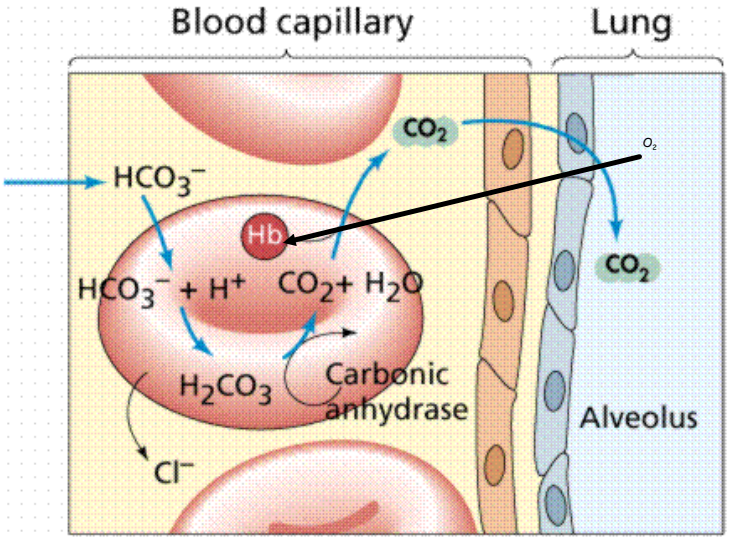
Both ↑ the surf. area for absorption

Villi ↑ surf. area for absorption of nutrients into the blood

Alveoli ↑ surf. area for absorption of O_2 into blood

CO_2 travels in the blood





CO_2 travels in blood

*70%- Plasma (HCO_3^-) Bicarbonate ion

**20%- Carboxyhemoglobin (in RBC)

***10%- CO_2 dissolved in blood (Plasma)

* CO * deadly gas - because it binds to hemoglobin better than O_2

1. PHASE OF BREATHING: Inhalation

a. Diaphragm + Ribs

Diaphragm moving down

b. Size of chest cavity

↑ (Bigger)

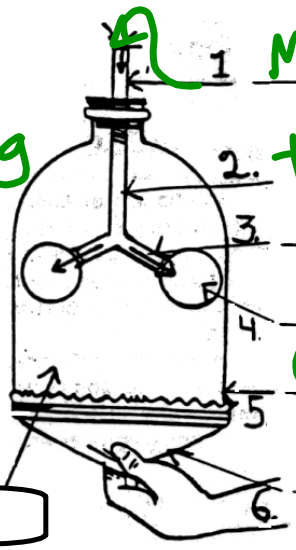
c. Pressure in chest cavity

↓

d. Air movement

HP → LP

out → inside



1 Mouth/Nose

2. trachea

3 Bronchus

4 Lung

5 Chest Cavity

6 Diaphragm

---

2. PHASE OF BREATHING Exhalation

a. Diaphragm + Ribs

upward

b. Size of chest cavity

↓

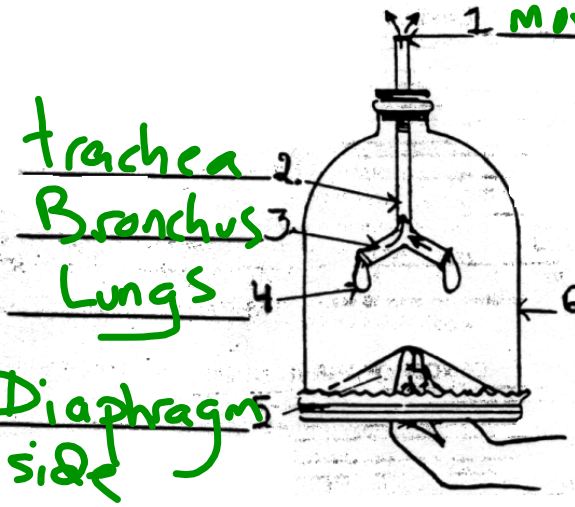
c. Pressure in chest cavity

↑

d. Air movement

HP → LP

inside → outside



1 mouth/nose

trachea 2.

Bronchus 3

Lungs 4

6. Chest Cavity

Diaphragm 5

Use arrows to show direction or air movement.

10

Apnea --involves stoppage of breathing for as long as 10 seconds, in some individuals as often as 300 times per night. This failure to respond
to elevated blood levels of carbon dioxide may result from viral infections of the brain, tumors, or it may develop spontaneously.
SIDS (sudden infant death syndrome)-- A malfunction of the breathing centers in newborns may result in

Getting the wind knocked out of you

- diaphragm spasm that occurs when sudden force is applied to the abdomen which puts pressure on the solar plexus. It results in a temporary paralysis of the diaphragm that makes it difficult to breathe for a short period of time
- It can also occur from a strong blow to the back.

When the abdomen is struck, a large difference in pressure occurs across the diaphragm. The diaphragm then stretches, which also stretches the diaphragm's nerves. The resulting mechanical force puts the diaphragm into a muscle spasm

Hiccups--is also a form of diaphragm spasm, although much milder. It impairs voluntary breathing control for brief moments (measured in milliseconds) rather than for several seconds.

As altitude increases, atmospheric pressure decreases. Above 10,000 feet
decreased oxygen pressures causes loading of oxygen into hemoglobin to
drop off, leading to lowered oxygen levels in the blood. The result can be
mountain sickness (nausea and loss of appetite).

As alt ↑ O_2 pressure ↓ less O_2 harder to breathe

Jan 30-2:05 PM

THINKING CONNECTIONS: Life Science Book B

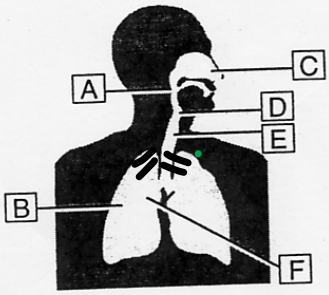
Concept Maps

Concept Map: Respiratory System

Name _____

Date _____ Period ____

Directions: Select words from the word list and fill in the blank map items. Use each word only once, and use all the words on the list. Write the letter of each label on the diagram in the box with its corresponding name.



OXYGEN
helps with
contained in
enters the body through
Burning of food
AIR
Nose C
Mouth
occurs in
warms
releases
energy
cells
used by
leads to
leads to
A
pharynx
leads to
heart
leads to
Pulmonary vein
goes into
Larynx D
also called
Voice box
covered by
epiglottis
leads to
blood
Trachea E
gives up
held open by rings of
Cartilage
splits into
Carbon Dioxide
Bronchi F
removed by
deliver oxygen to
branch into
lead to
enters
changes pressure in
Lungs B
contain
alveoli
action of breathing controlled by
Diaphragm
beneath
are tiny thin-walled
is a
muscle
sacs

WORD LIST

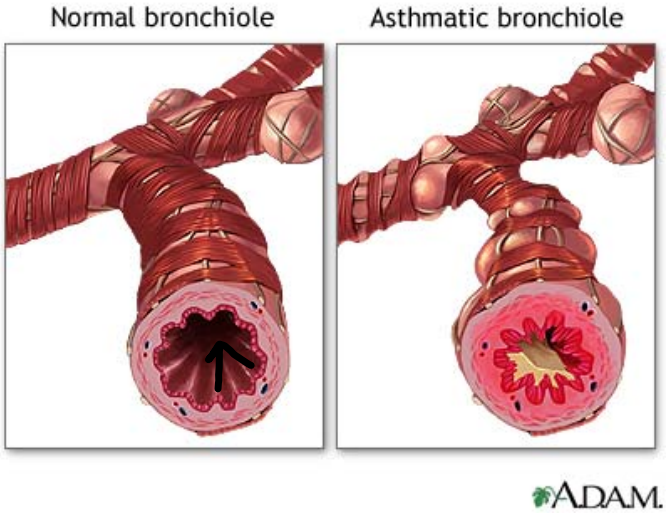
air
alveoli
bronchi
burning of food
carbon dioxide
cartilage
cells
diaphragm
epiglottis
larynx
lungs
mouth
nose
pulmonary vein
trachea
voice box

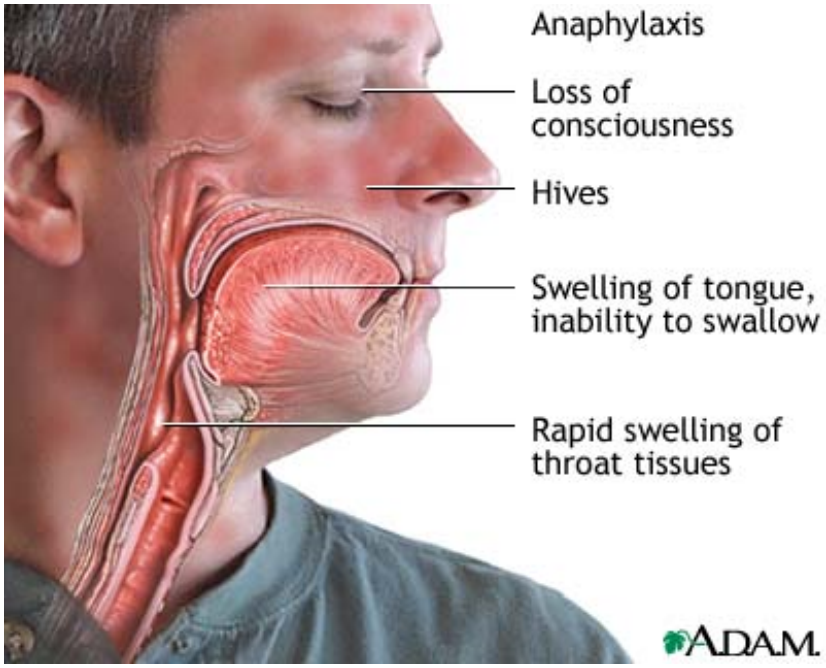
64

Feb 1-12:53 PM

Diseases of the Respiratory System

Asthma: An allergic reaction in which the bronchial tubes narrow (constrict)





Anaphylaxis is an acute systemic (whole body) type of allergic reaction.

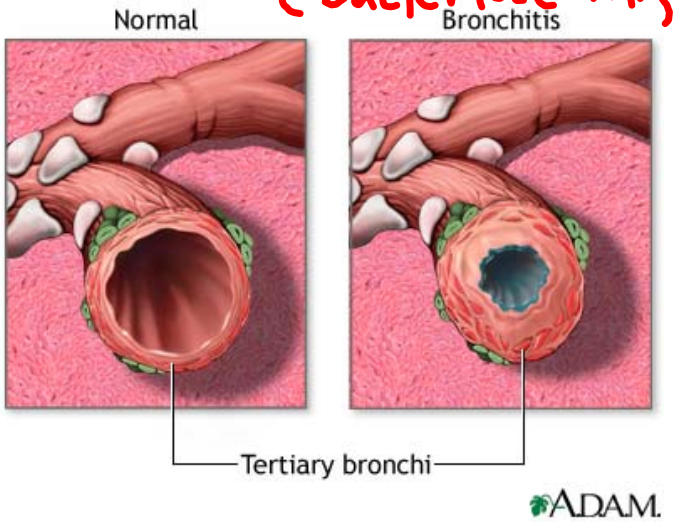
bloodstream cause blood vessels to dilate and tissues to swell.

- Anaphylaxis may be life-threatening if obstruction of the airway occurs, if blood pressure drops, or if heart arrhythmias occur.

Lung cancer:
An overgrowth of abnormal cells that interfere with normal functioning

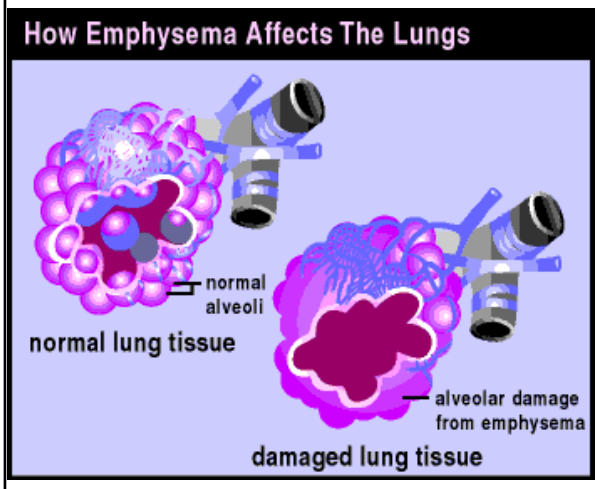
Feb 4 - 11:36 AM

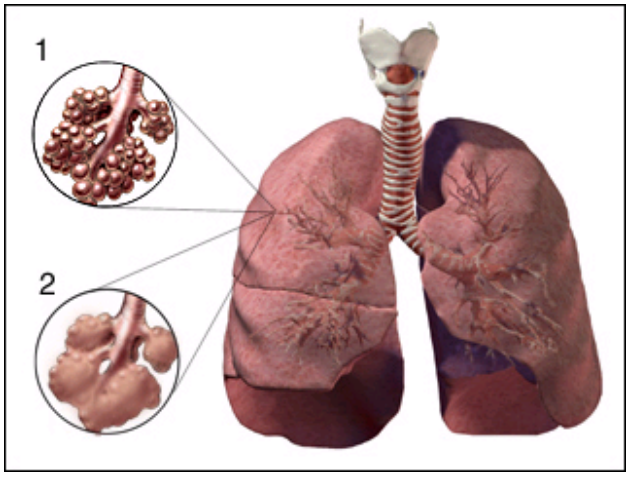
Bronchitis:
inflammation of the linings of the bronchial tubes (bacterial infection)



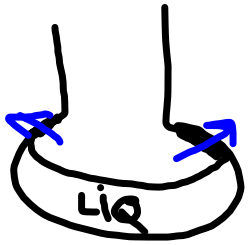
Feb 4 - 11:35 AM

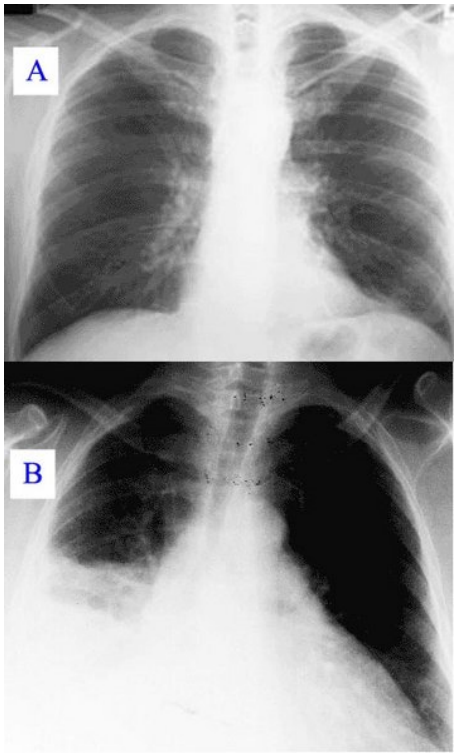
Emphysema:
A disease in which the walls of the alveoli break down, decreasing the surface area for gas exchange.





Pneumonia:
The alveoli become inflamed and flooded with fluid due to a bacterial or viral infection





Cigarettes contain:

Nicotine:
Drug(stimulant) that increases heart rate and blood pressure [Addictive]

Carbon Monoxide:
Competes with oxygen to bind with hemoglobin in RBCs(decreases the amount of oxygen that gets to the cells)

Tar:
causes cancer [carcinogen]

Attachments

- RESP.doc
- Vital Capacities of Students in the class.doc
- APPLICAT.doc
- Smoking_.asf