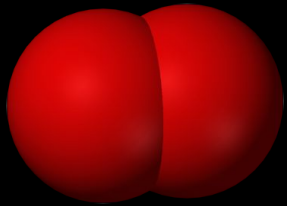


The Respiratory System

- Functions of the Respiratory System

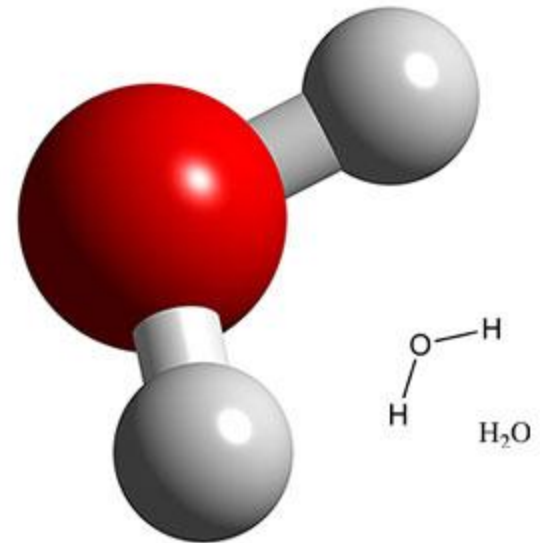
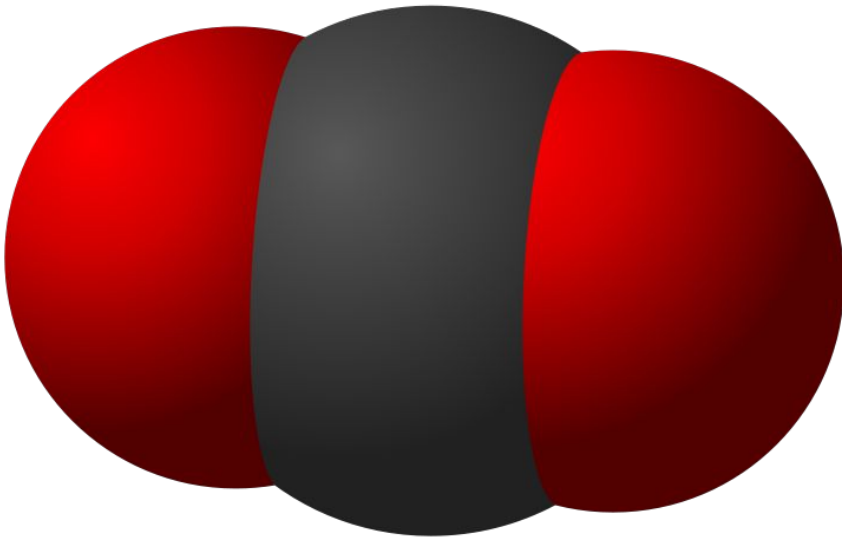
1. Intake of Oxygen

- *Respiration (Cellular)*: chemical reaction involving oxygen & glucose that results in the release of energy to fuel various cellular processes.
 - Respiration \neq Breathing
 - » Breathing: the movement of air into & out of the lungs
- Body uses only 5% of the oxygen you inhale with each breathe.
- Oxygen is carried throughout the body via the circulatory system (network of arteries, veins & capillaries)



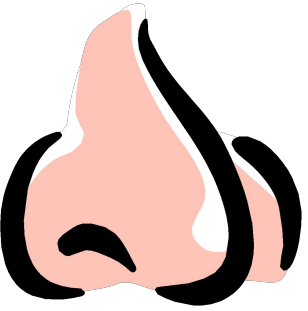
2. Removal of Carbon dioxide & Water

- Carbon dioxide & small amounts of water are by-products of cellular respiration.
- They are then removed via the Respiratory & Excretory systems.



Organs of the Respiratory System

– Nose



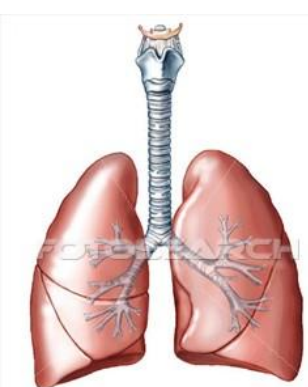
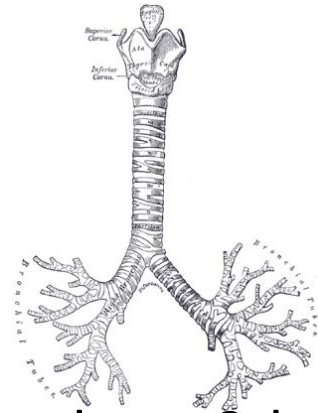
- Nasal cavities located just inside the nose are lined with mucus to trap foreign particles from entering lungs.
- *Cilia*: hair-like structures that move mucus to the throat to be swallowed & destroyed in the stomach as well as trap foreign particles.

– Pharynx

- throat; shared with Digestive System

– Trachea

- windpipe; lined with cartilage that strengthens & keeps the windpipe open.
- Lined with mucus & cilia which helps to trap foreign particles & moisten the air as it enters the windpipe.

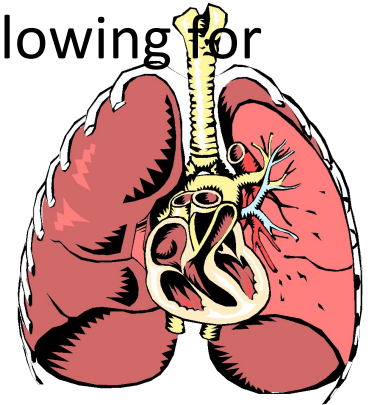


– Bronchus (Bronchi)

- muscular tubes that extend from the trachea & direct air into the lungs
- Divides into smaller & smaller tubes inside the lungs
 - *Alveoli*: tiny hollow sacs of specialized lung tissue surrounded by capillaries where oxygen is exchanged for carbon dioxide.
 - 300 million in the average adult lung allowing for large intake of oxygen.

– Lungs

- Primary organs of the Respiratory System
- “pulmo”- prefix that means “of the lungs”
- Located on both sides of the heart
- Elastic tissue that expands & contracts as you inhale & exhale.

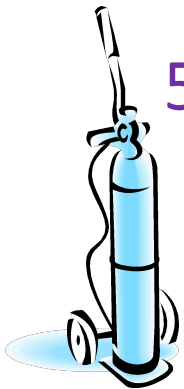


– Diaphragm

- Dome shaped muscle located at the base of the lungs.

• The Gas Exchange Process

1. Carbon dioxide/Oxygen rich blood flows into capillaries surrounding the alveoli.
2. Oxygen moves from the alveoli into the capillaries surrounding the alveoli.
3. At the same time, Carbon dioxide moves from the capillaries into the alveoli replacing the Oxygen.
4. The Oxygen rich blood is then carried through the arteries back to the heart.
5. The Carbon dioxide is then expelled from the lungs as the lungs deflate.



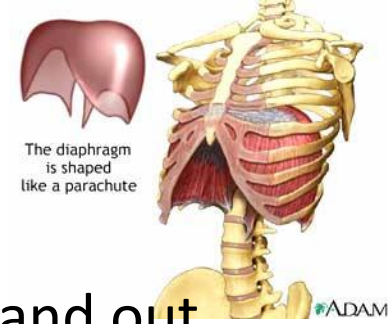
- Breathing

- Inhalation

- Rib muscles contract lifting the chest wall up and out.
 - Diaphragm contracts & moves downward increasing the size of the chest cavity & decreasing the pressure within the cavity.
 - The pressure of air is now higher than your chest forcing air into your chest cavity.

- Exhalation

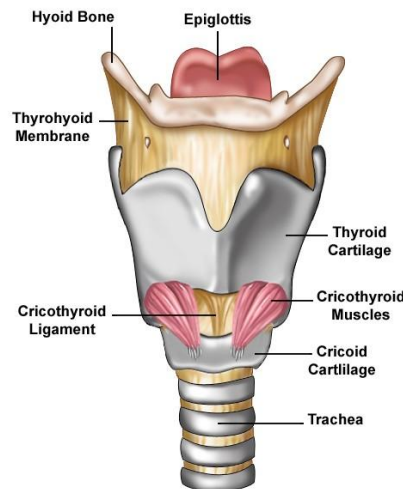
- Rib muscles relax lowering the chest wall.
 - Diaphragm relaxes & moves upward forcing the lungs to flatten & carbon dioxide to be forced out of the lungs.



- Speaking

- Larynx: voice box

- Vocal cords: folds of connective tissue that stretch across the opening of the larynx.
 - Muscles make the vocal cords contract narrowing the opening.
 - Air rushes through the opening.
 - The movement of the vocal cords makes the air vibrate.
 - This vibration creates a sound, your voice.



- Respiratory diseases

- Bronchitis

- Bronchial passages within the lungs narrow & then become clogged with mucus.

- Emphysema

- Alveoli within the lungs become damaged or destroyed preventing the effective exchange of oxygen & carbon dioxide.

- Lung cancer

- Uncontrolled growth of lung cells that produce tumors that prevent the lung from operating effectively.

- Atherosclerosis

- Speeds up the buildup of fatty material within arteries & veins.

