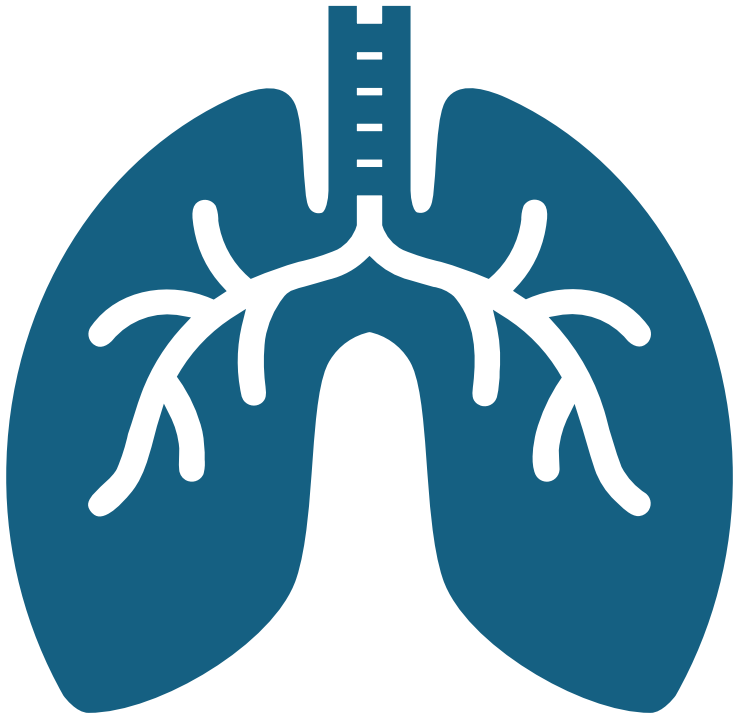
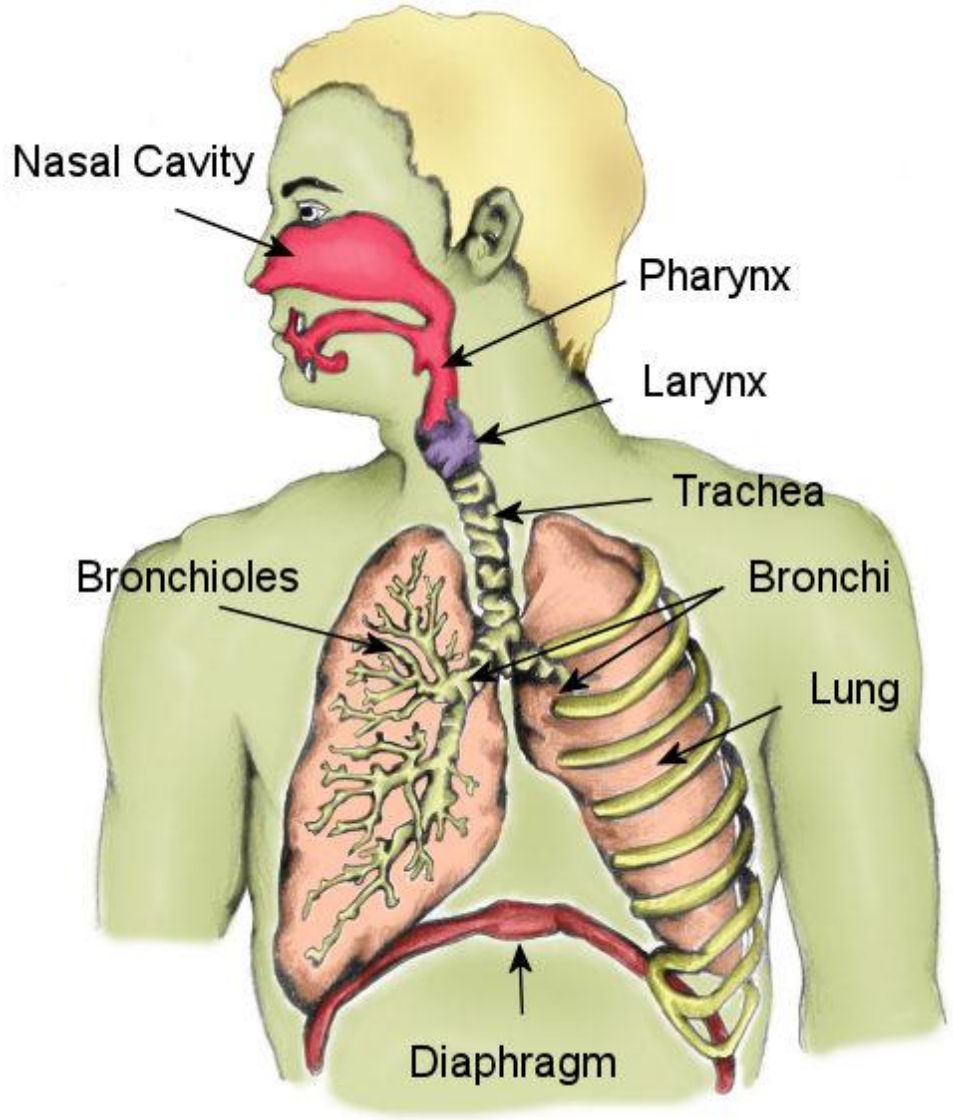


Prepared by: Besir Zeneli

Respiratory System

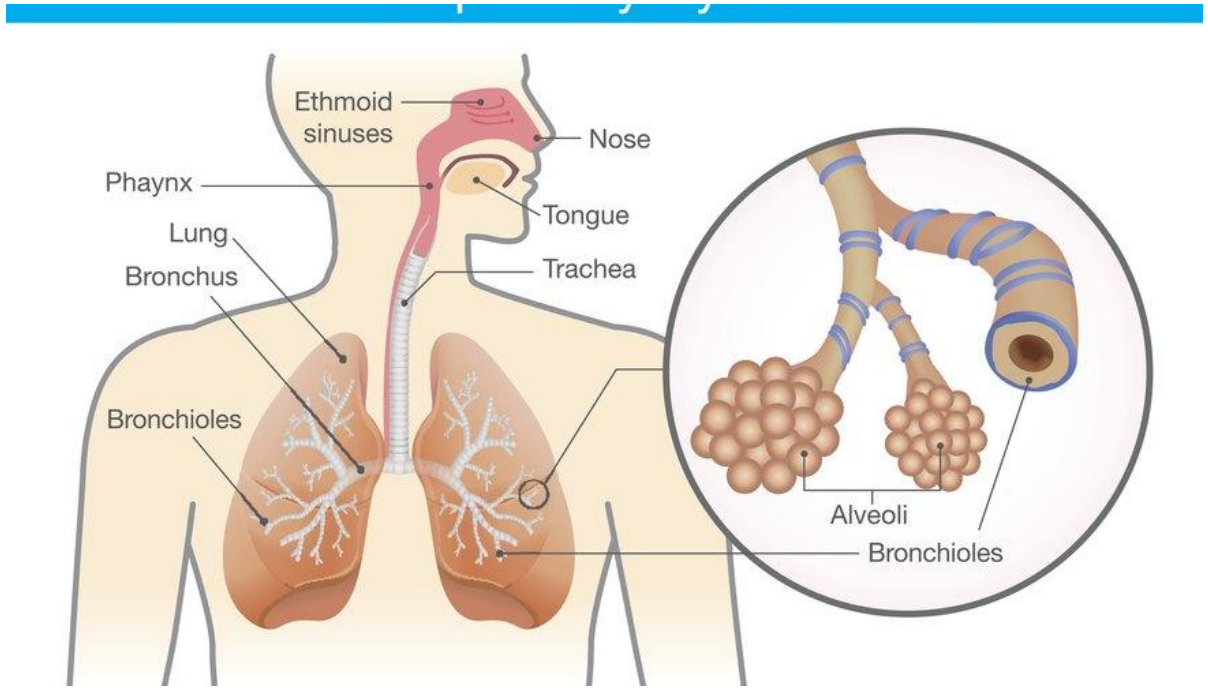
The Respiratory System Overview

- **Definition:** The respiratory system is a complex network of organs and tissues that help us breathe.
- **Main parts:** Nose, mouth, trachea, Pharynx, Larynx, Trachea, lungs, bronchi, bronchioles, alveoli and diaphragm.
- **Function:** To take in oxygen and expel carbon dioxide, enabling gas exchange.



Basic parts of the respiratory system

- **Nose and Mouth:** Entry points for air.
- **Trachea:** Windpipe that carries air to the lungs.
- **Lungs:** Organs responsible for gas exchange.
- **Bronchi and Bronchioles:** Branches of the trachea that lead to the lungs.
- **Alveoli:** Tiny air sacs in the lungs where gas exchange occurs.

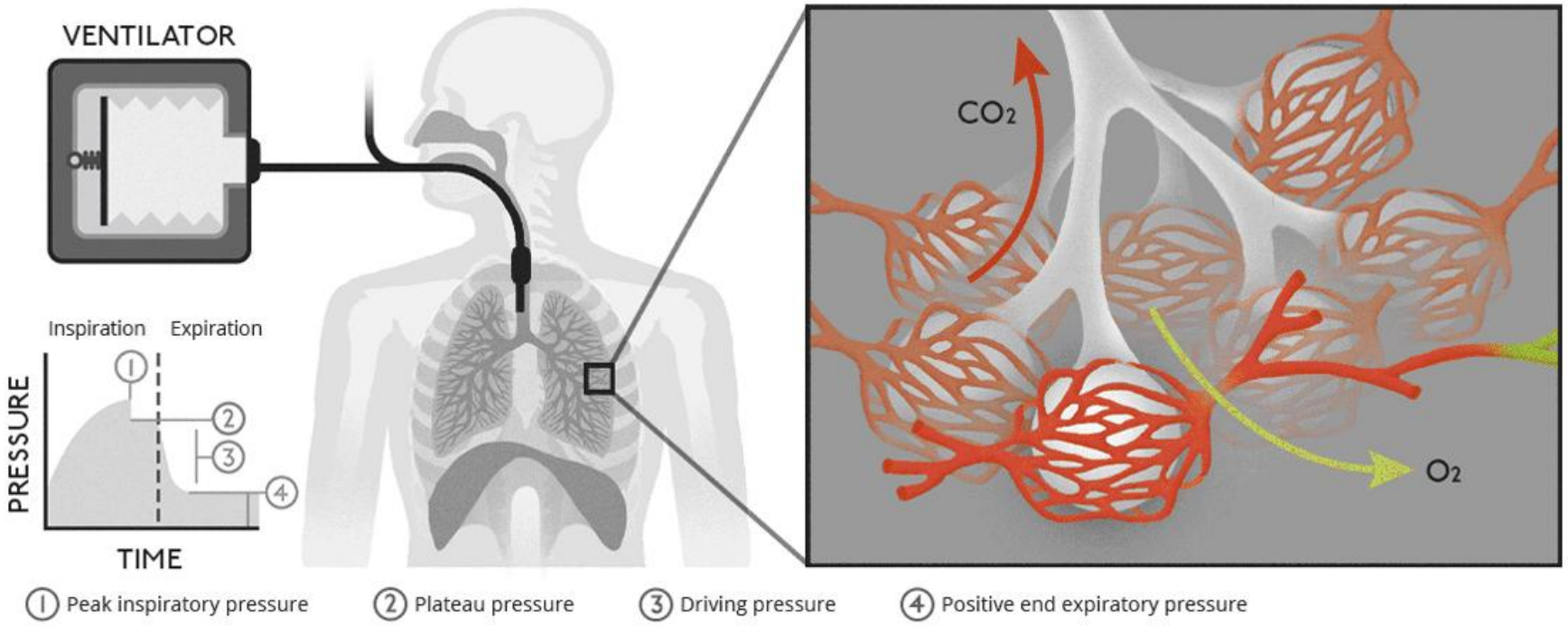


Epiglottis

The epiglottis is a small, leaf-shaped piece of cartilage located in the throat, behind the tongue and on top of the larynx (voice box). It plays two important roles:

1.Protecting the airway: During swallowing, the epiglottis folds backward to cover the opening of the larynx, preventing food and liquids from entering the trachea (windpipe) and lungs. This is essential for preventing choking and aspiration pneumonia.

Speech production: The epiglottis also helps to shape the sounds we make when we speak. By moving in different positions, it can help to create different vowel sounds.



Gas exchange

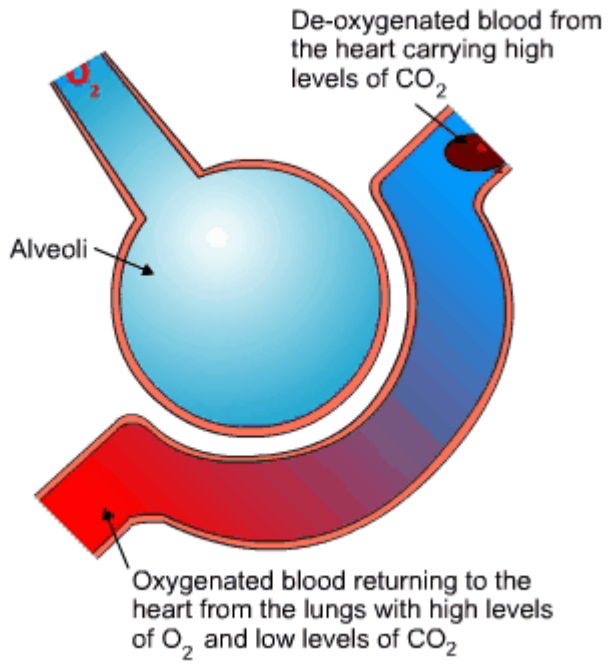
- Process: Oxygen from the air we breathe enters the bloodstream through the alveoli, while carbon dioxide is removed from the bloodstream and exhaled.
- Importance: Provides oxygen to cells for cellular respiration and removes waste carbon dioxide.

Gas exchange

De-oxygenated blood comes from the heart. CO2 is released to alveoli.

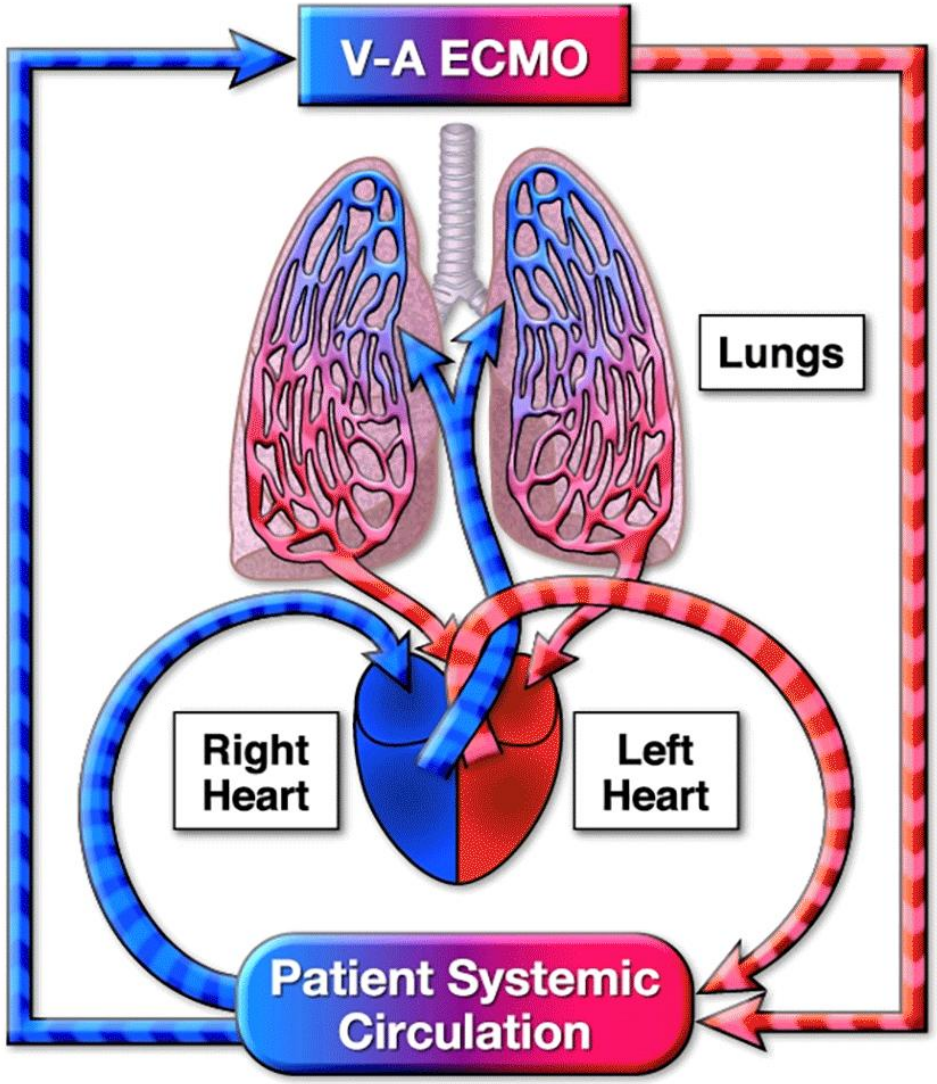
O2 comes from the air into alveoli. O2 binds to red blood cells. Oxygenated blood returns to heart.

https://www.youtube.com/watch?v=57byXpOUpSU



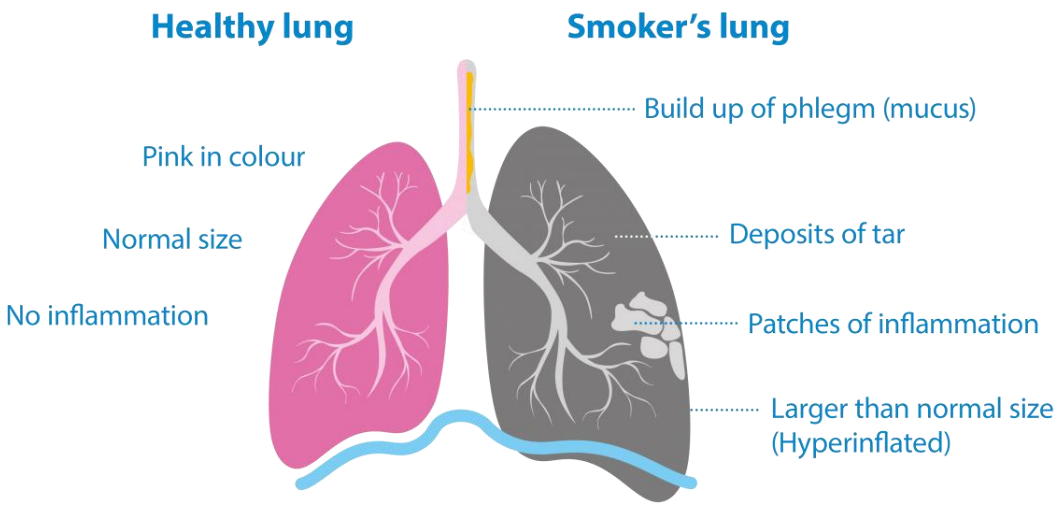
Connection with the Circulatory System

- The respiratory and circulatory systems work closely together.
- Oxygenated blood from the lungs returns to **left side of the heart** and then is pumped to the rest of the body via the circulatory system.
- Deoxygenated blood returns to the lungs from **right side of the heart** to pick up oxygen and release carbon dioxide.



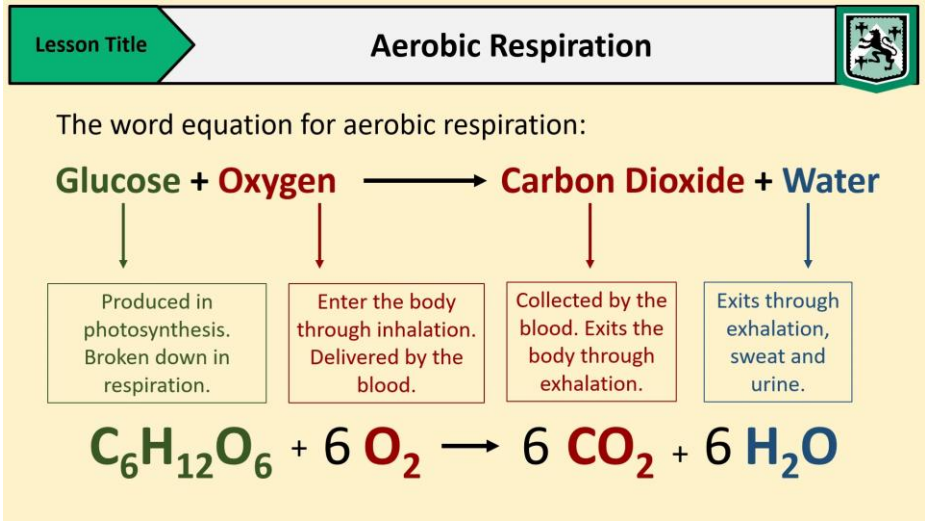
Effects of smoking

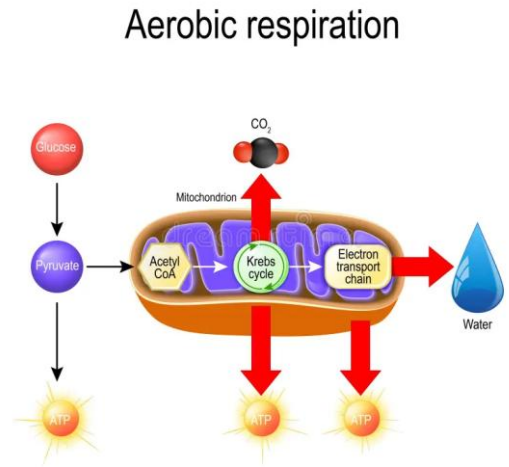
- Smoking damages the respiratory system.
- Harmful chemicals in tobacco smoke:
  - **Tar:** Clogs airways and damages lung tissue.
  - **Nicotine:** Addictive substance that narrows blood vessels, increasing blood pressure.
  - **Carbon monoxide:** Reduces oxygen-carrying capacity of blood.
- Long-term effects: **Chronic obstructive pulmonary disease** (COPD), **lung cancer**, **heart disease**.



Aerobic Respiration

- The body derives its energy from **glucose**, which requires the presence of oxygen to be utilized effectively. Glucose undergoes processing within our cells only in the presence of **oxygen**, leading to the release of a **significant amount of energy**.
- **Definition:** The cellular process involving the conversion of glucose and oxygen into energy, carbon dioxide, and water.
- **Equation:** C6H12O6 + 6O2 → 6CO2 + 6H2O + Energy (ATP) Importance: Essential for fueling various cellular activities such as muscle contraction and growth by providing energy.





Human Respiratory System Overview

- https://www.youtube.com/watch?v=s6xUQxnjXmg
- https://www.youtube.com/watch?v=v_j-LD2YEqg