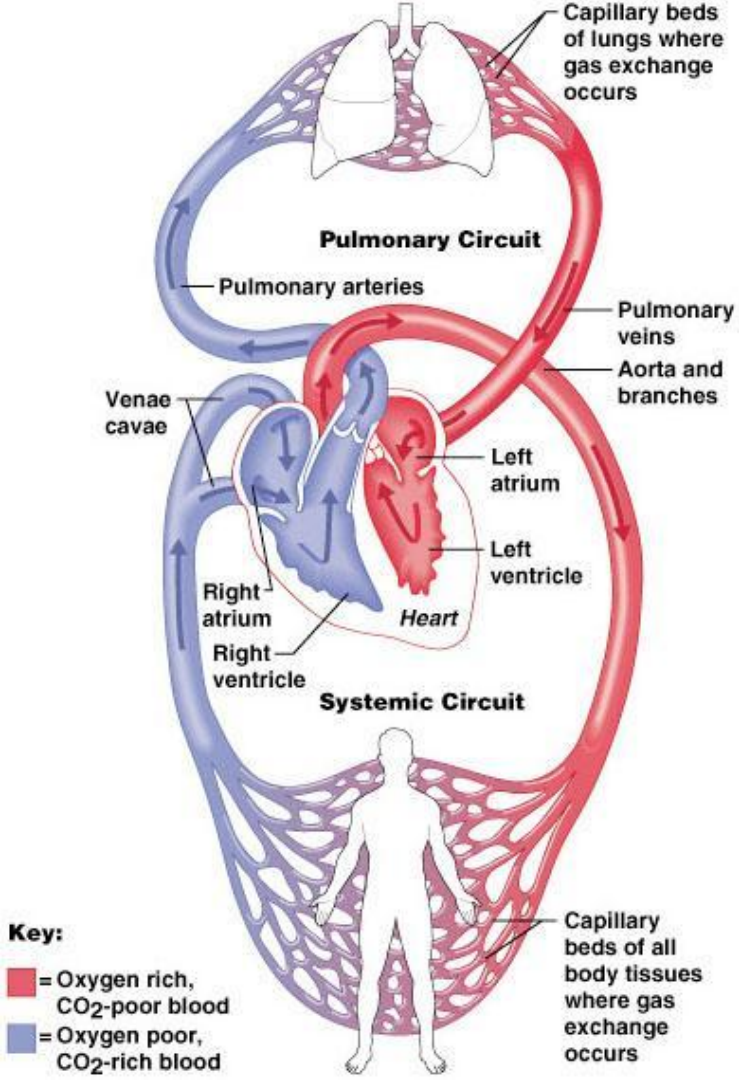
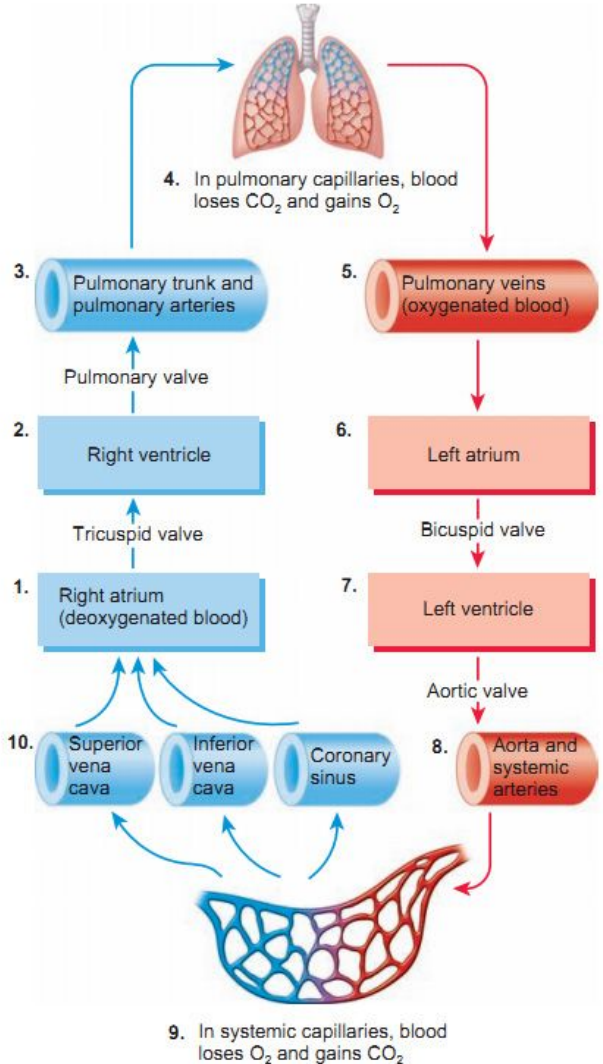
Aim: SWBAT talk about the functions of the heart and how it affects our athletic ability

Do Now: What is more dangerous a heart attack or cardiac arrest? Why?


Capillary beds of lungs where gas exchange occurs
Pulmonary Circuit
Pulmonary arteries
Pulmonary veins
Aorta and branches
Venae cavae
Left atrium
Left ventricle
Right atrium
Heart
Right ventricle
Systemic Circuit
Capillary beds of all body tissues where gas exchange occurs
Key:
= Oxygen rich, CO_2-poor blood
= Oxygen poor, CO_2-rich blood


4. In pulmonary capillaries, blood loses CO_2 and gains O_2
3. Pulmonary trunk and pulmonary arteries
5. Pulmonary veins (oxygenated blood)
Pulmonary valve
2. Right ventricle
6. Left atrium
Tricuspid valve
Bicuspid valve
1. Right atrium (deoxygenated blood)
7. Left ventricle
Aortic valve
10. Superior vena cava
Inferior vena cava
Coronary sinus
8. Aorta and systemic arteries
9. In systemic capillaries, blood loses O_2 and gains CO_2

Heart Beat

- **Heart sounds** (heard using a stethoscope)
  a. "lubb" AV valves close, ventricles contract
  b. "dupp" semilunar valves close, ventricles fill
  c. ejection of blood
- **Contraction:**
  - The stage when ventricles are contracting this stage is called **systole**
  - The period during which the heart is relaxed and the ventricles are filling with blood is the **diastole.**

Heart Rate

- Changes in heart rate are caused by
  - Parasympathetic and sympathetic impulses reaching the pacemaker
  - By hormones (Epinephrine, Norepinephrine (Adrenaline))
  - Increased oxygen demand from exercise

EKG

- **Electrocardiogram -** Electrical fields within the heart can be mapped by this device
  - The electrocardiogram can be used to detect both normal and abnormal events in the cardiac cycle
  - (ECG or EKG): record of electrical activity of the heart
  - Problems that can be discovered
    - tachycardia: > 100 beats/min.
    - bradycardia: < 50 beats/min. “Runners Heart”

Heart Muscle

- Is stimulated by nerves and is self-excitable (**automaticity**)
- Contracts as a unit
- Cardiac muscle contraction is similar to skeletal muscle contraction

Things to know

1. Autonomic nervous system: (innervation of the heart)
    a. sympathetic: stimulates through cardiac nerve
    b. parasympathetic: relaxes through vagus nerve
2. changes in body temperature:
    a. warm: increases heart rate
    b. cool: decreases heart rate

Experimental Question

How does an SOF sports science students heart rate change when they are walking and running?

Control Group:

Experimental Groups:

Hypothesis:

Experiment

Before you begin,clear with Mr Chesler or Mr Mark the following.

- Hypothesis (Choose if you want to compare Groups or changes)
- Procedure
- Data Table
- Group members (last in list first in our hearts)

What data we need to include on graph.

- Our heart rates
- Group Avg Heart Rates
- Class Avg Heart Rates
- XX vs XY Avg
- Taller than Mr Mark vs Shorter than Mr Mark

Name	Resting Rate		Walking Rate		Running Rate	
xxxxxxxxx	Beats 10 s	Beats 60 s	Beats 10 s	Beats 60 s	Beats 10 s	Beats 60 s

1. Find your heart beat by placing two fingers on your wrist. Ask for assistance if you experience any difficulty with this task.
2. Count each thump as one beat.
3. Sit in your chair. Have your partner time you for ten seconds as you count the number of beats.
4. Multiply the number of beats by six. This is how much your heart beats in a minute while you are resting (your resting heart rate).
5. Record the number of beats in the data table.
6. Stand up and have your partner time you for one minute as you walk around the class. At the end of a minute count the number of beats for ten seconds. Multiply the number of beats by six to determine the number of heart beats in a minute while walking (your walking heart rate). Record the data in the data table.
7. Repeat all aspects of step number six, this time while running in place (your running heart rate). Record your data.
8. Repeat steps one through seven with all members of the group and record all data.
9. Find the average heart rate for each category (resting, walking, and running)