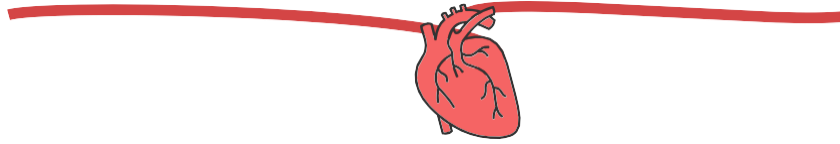


Name:

Date:

# Circulatory System

~Make sure to read all instructions prior to starting~



## Background Information:

The heart is a muscle that pushes blood throughout the body. This process of blood being pushed throughout the body is called circulation. Blood circulates through arteries, allowing us to measure our pulse.

A pulse is the regular expansion of arteries caused by the pushing of blood into the arteries by the contractions of the heart. When checking your pulse you are checking the number of times your heart beats per minute and the strength of your heartbeat.

## Blood Flow of the Heart:

The circulatory system is the system in our body responsible for blood flow. Parts of the circulatory system include heart, arteries, capillaries, and veins.

- Enters from body through right atrium (RA)
- Travels down to right ventricle (RV)
- Pushed into pulmonary arteries in the lungs
- Picks up oxygen from the lungs
- Travels back to the heart through pulmonary veins
- Enters into left atrium and travels to the left ventricle
- Travels out to the body's tissue through the aorta

## Parts of the Heart:

The Right Atrium receives blood from the veins and pumps it to the Right Ventricle.

The Right Ventricle receives blood from the Right Atrium and pumps

The Left Atrium receives oxygenated blood from the lungs and pumps it to the Left Ventricle.

The Left Ventricle (the strongest chamber) pumps oxygen-rich blood to the rest of the body.

Pulmonary Artery- the artery carrying blood from the Right Ventricle of the heart to the lungs for oxygenation.

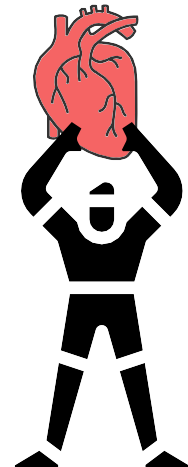
Pulmonary Vein- a vein carrying oxygenated blood from the lungs to the Left Atrium of the heart.

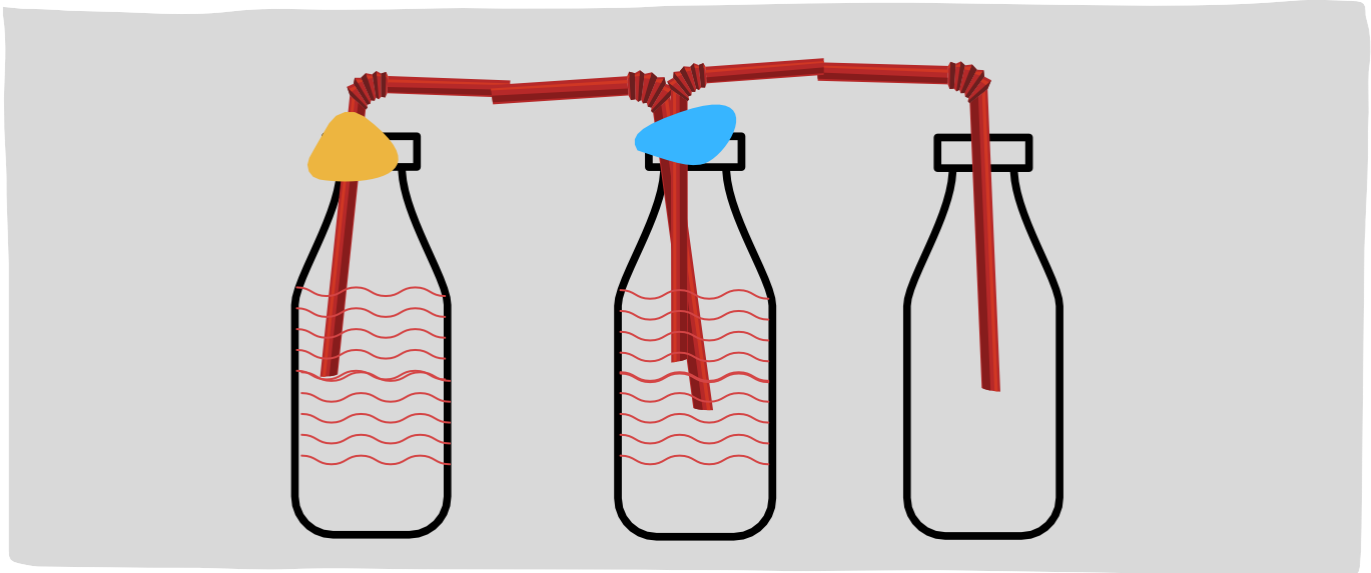
Aorta- the main artery of the body, supplying oxygenated blood to the circulatory system

## Pre Questions-

Based on the background information provided...

- What do you predict your resting heart rate will be?
- After 10 Jumping Jacks?
- After 25 Jumping Jacks?
- 2 minutes after completing all Jumping Jacks?

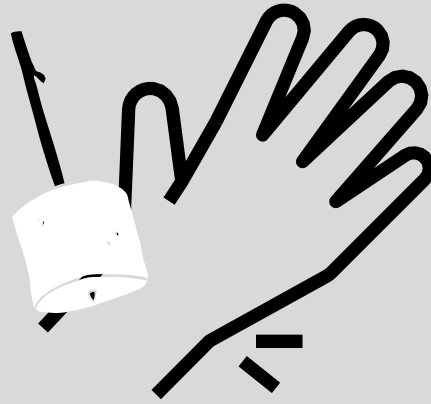




### Model & Experiment Instructions

1. Stretch and bend two of the straws into 90 degree angles. Then slide one straw mouthpiece into the other.
2. Repeat this with the second set of straws.
3. Place the three bottles on the table, filling two of them about  $\frac{2}{3}$  of the way and leaving the third bottle empty.
4. On the first bottle, place the cap that is labeled '1.' (1 straw hole and one small hole) (**the first bottle represents the atrium**)
5. Place the cap labeled '2.' (2 straw holes) (**second bottle the ventricles**)
6. Leave the third bottle without a cap. (**the third bottle represents the lungs/body**)
7. Carefully slide the straws through the holes on the lid.
8. Place clay/play doh around the base of the straws on the center bottle to create an airtight base.

In order for the model to work correctly, pinch the straws which connect bottle 1 and bottle 2, while simultaneously squeezing bottle 2.  
Watch as the "blood" enters bottle 3.



9. After the model has been built, locate your pulse on your wrist.
10. Place a toothpick In the center of the marshmallow about 1/3 of the way in.
11. Lay your hand flat on the table, palm side up.
12. Place the marshmallow on your wrist where you located your pulse.
13. Each time the toothpick leaps, squeeze the bottle.
14. Do this one for one minute, record the beats per minute
15. Do 10 jumping jacks.
16. Record your findings, then repeat steps 4-6. But this time complete 25 jumping jacks, then record your pulse 2 minutes after completing the 25
17. Confirm whether your hypothesis is correct, and answer follow-up questions

**Post Questions**

<b>Pulse Reading</b>	<b># of beats/minute</b>
At Rest	
After 10 Jumping Jacks	
After 25 Jumping Jacks	
2 Minutes After Jumping Jacks	

**Post Questions**

• What is something about the experiment that surprised you?

• How did your heart rate change after completing 10 jumping jacks? 25?

• Based on your observations, what would happen to your pulse 10 minutes after completing jumping jacks?