Circulatory system

Is the system that transports in the blood oxygen, nutrients, carbon dioxide, hormones and cells to the rest your body.

Objectives:

- Learn the composition and function of circulatory system.
- Understand what does the circulatory system transport.
- Understand how the heart works.
- Understand the difference between veins and arteries.

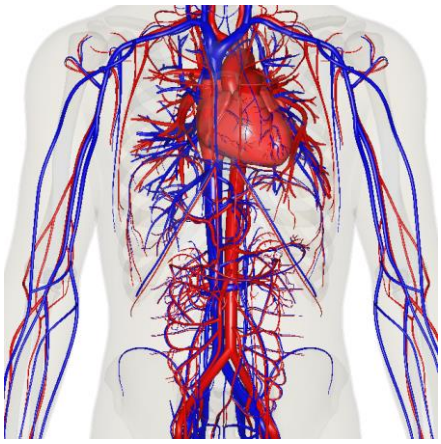
Find your circulatory system

Describe the parts that conform the circulatory system and locate them in your body. Explain the concepts: Heart and blood vessels.

Heart: Is a muscle that helps to pump the blood, is composed by two atria and two ventricles.
Arteries: Transport the blood from the heart to the body they are thick and have muscular walls to move the blood.
Veins: Transport the blood from the body back to the heart they are thinner and less flexible. Lack muscles but have valves to stop the blood of going backwards.
Capillaries: Connect veins and arteries with the cells from the rest of the body to deliver nutrients and oxygen and remove carbon dioxide.

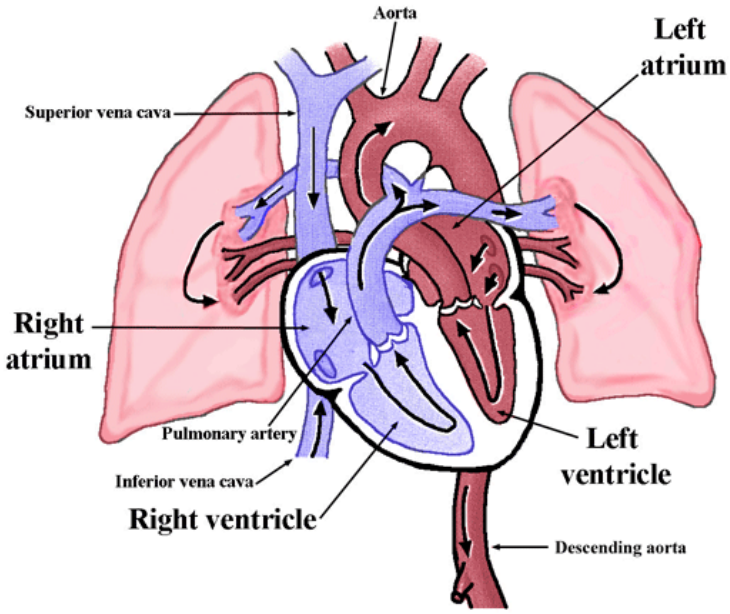
Your blood vessels are 60,000 miles long, they can circle the earth more than twice!!!

1. Look at the veins at your hand, how do they look like? What is their job?
2. Press your finger and see how it turns yellow. What is happening with the blood? What happen when it recover its color?
3. Put your hand in your chest and listen (feel) to your heart. What is it doing? Why do you think it make the noise?



Exercise 1. Understand how the heart works

The heart is a muscle in our body in charge to pump the blood. The heart moves thanks to an electrical conduction system. It bits between 60 and 100 times per minute but the rate can be modified depending on the activity. Can you give and example of time when your heart beat faster or slower? (for example scary moment, exercising or sleeping). The heart is divided in four chambers as the rooms in your house. Two **atria** and two **ventricles**, they also have doors to stop and allow the flow of the blood called **valves**. The heart is in charge to send the blood where it needs to be, first to the lungs to get oxygen and then to the body to deliver oxygen.



Some fun facts:

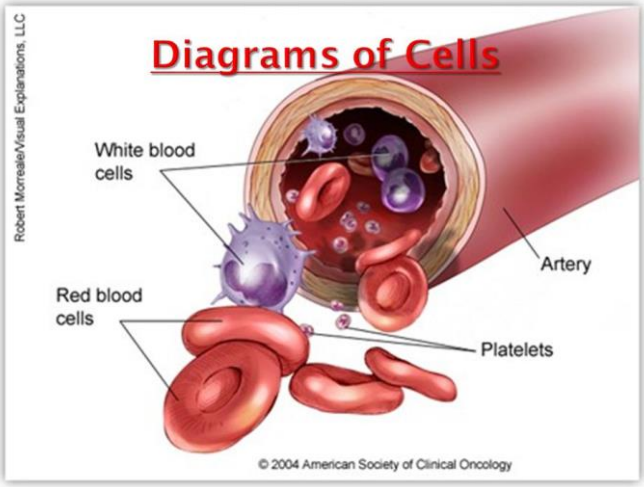
- Is one of the only muscles that work without need to think about it (can you name another one? E.g muscles from stomach and intestines
- Heart is not beating is “clapping” the sound correspond to the valves (open and close)
- The heart works more than every muscle in your body
- Heart push the blood one mile per hour!

1. Squeeze the pisette pump to push water out and count how many seconds it takes to cross the tube.
2. Explain how the speed of the water varies depending on the pressure. What is the importance of the heart?
3. Run for a 30 sec, now listen to your heart. What happen? Why do you think is bumping faster.

Exercise 2. Create your own blood.

Blood: Blood is in charge to transport some basic molecules, small parts that we can not see but help the body to stay healthy, providing oxygen and nutrients and defenses to the body. It's composed by erythrocytes, leucocytes, thrombocytes (platelets) and plasma.

- **Plasma** is the aquatic section of the blood.
- **Erythrocytes** (red cells) red due hemoglobin and transport oxygen and carbon dioxid
- **Leucocytes** (white cells) defend the body against external substances and diseases.
- **Platelets** small colorless involved in clotting



Make your own blood according to the description of the kids A,B and C. Each tutor will have 3 cups (one for each image) and different cells (candies). Add the correct proportion of cells that each kid would have in their blood according to their situation.

A) The composition of the blood need to have more erythrocytes (red cells)
B) The composition of the blood need to have more leucocytes (white cells)
C) The composition of the blood need to have more thrombocytes

A

B

C

Exercise 2. Create a cardiac cycle

The heart pumps 1.6 gallons (6 liters) each minute!

For a blood cell it takes approximately 20 seconds to circle the body, 10 to goes to your big toe and back. They make approximately 2500 thousand trips of the body before died and they can live 4 months and feed 60 trillion cells.

Using the circulatory system diagram follow a erythrocytes through their journey.

1. Grab a plasticine erythrocyte, and locate it in the start point (the heart)
2. Direct it to the lungs where the hemoglobin will pick the oxygen.
3. Take it back to the heart where the heart will push it to the body.
4. Follow the road of your preference and deliver the oxygen in the capillaries
5. Once the erythrocyte is clean take it back to the right chamber of the heart (Finish line)
6. Try the other types of cells.

Assessment Questions:

What are the main parts of the circulatory system?
What kind of jobs does the heart is responsible for?
Name the type of cells that are part of the blood and their jobs.