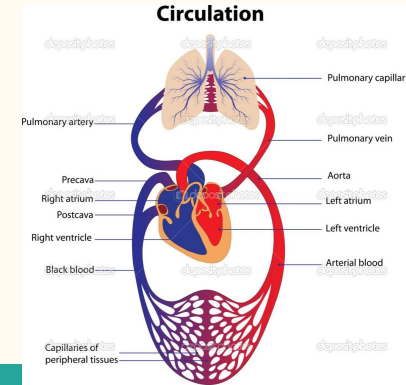


Frog - The Circulatory System

By: Hanna Steiner

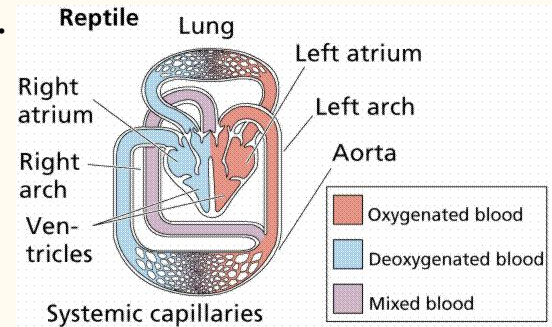
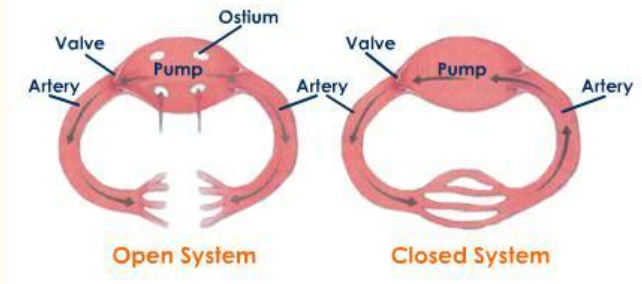
2. List the parts that are involved in the circulatory system and describe the function of each part.

- Ventricle - Chamber of a frog's heart that pumps blood out of the heart to the lungs and other parts of the body.
- Sinus Venosus - Sac that receives blood from the vena cava
- Posterior Vena Cava - Large vein that carries blood from the posterior part of the body towards the heart.
- Anterior Vena Cava - Large vein that carries blood from the anterior part of the body toward the heart.
- Heart - Pumping organ of the circulatory system (has 3 chambers).
- Truncus Arteriosus - Large artery in a frog that carries blood away from the ventricle into branches that lead to all parts of the body.
- Right Atrium - Chamber of the frog's heart which receives blood from the sinus venosus.
- Left Atrium - The chamber of the heart that receives blood from the lungs.
- Pulmonary Veins - The blood vessels that carry blood from the lungs to the left atrium.



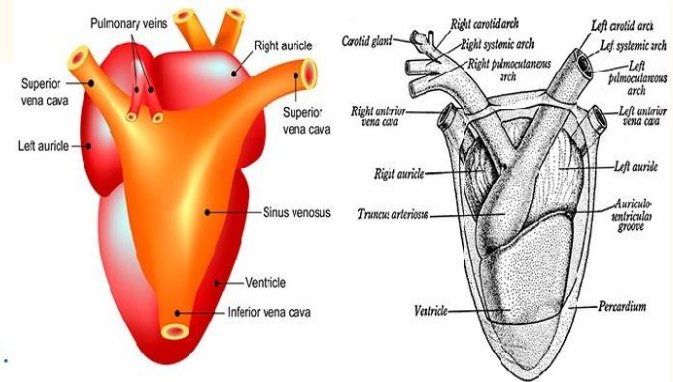
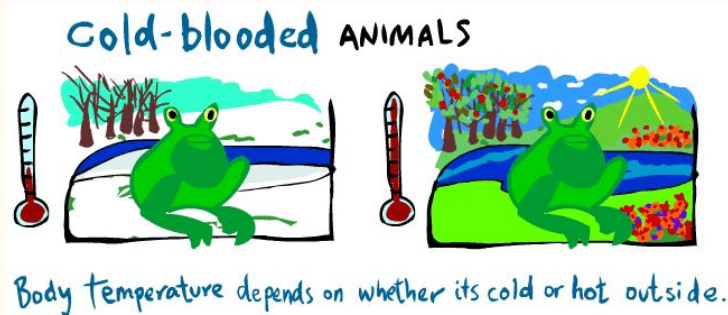
3. Explain how the frog is classified as a closed/open circulatory system.

In frogs, the circulatory system is closed and it uses the pulmonary circulation and systemic circulation. The system has two main jobs. First, it transports blood with oxygen and nutrients to cells all over the body. Second, it picks up waste products from the cells to be transported out of the body, and it takes the deoxygenated blood back to the lungs so it can regenerate. Since a frog has a closed circulatory system, the blood and other fluids stay inside a set of blood vessels and are never freely released into the body cavity. Typically, blood vessels vary in size, and oxygen and nutrients are exchanged between blood vessels and tissues throughout the tiniest ones. Also, frogs use a system called double circulation which means that there are now two pathways, or circuits, for blood to move around the body. The first circuit takes blood between the heart and oxygen source (lungs), and the second circuit takes blood between the heart and the rest of the body.



4. Explain whether the frog is able to regulate their internal body temperature. How is it able to?

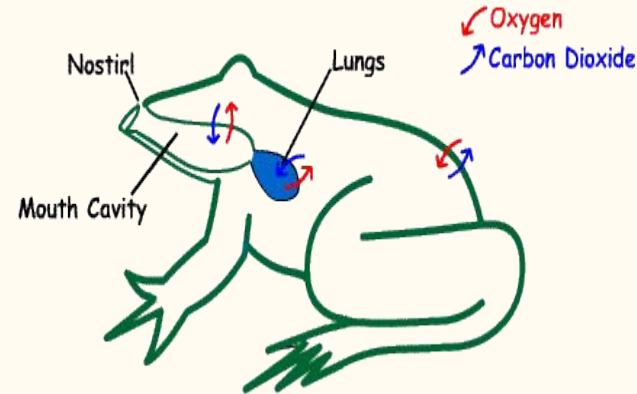
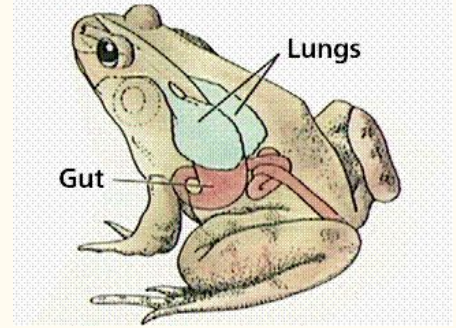
Frogs are known as ectotherms, which means they get their heat from external sources. They are often called cold blooded but they do not have cold blood. Their blood is just regulated by their environment. It's hard for frogs to keep their internal body temperature stable by themselves for long periods of time. However, most of the time they can control their temperature by changing their color to affect how much solar radiation they receive. Also, they can absorb or evaporate water through their skin. Frogs move around when the temperatures change at different times of the day so they don't overheat or freeze.



5. Explain how gases are exchanged and transported in a frog.

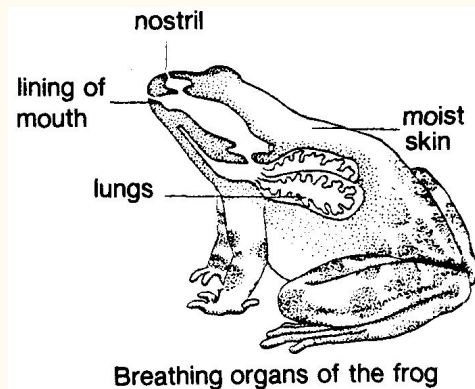
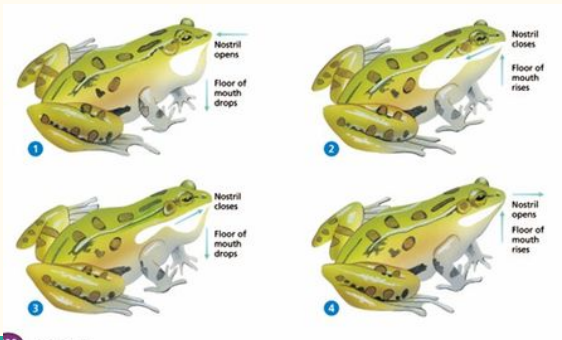
A frog has 3 surfaces on its body that it uses to exchange gas with the surroundings which is its skin, lungs, and the lining of the mouth. The skin is composed of thin membranous tissue that is permeable to water and contains a large network of blood vessels. This allows gases to readily diffuse down their gradients between the blood vessels and the surroundings. Also, when the frog is out of water the mucus glands in the skin keep the frog moist, which helps absorb dissolved oxygen from the air. When they want to the carbon dioxide in the lungs the floor of the mouth moves down, drawing air out of the lungs by contraction of the floor of the mouth. The nostrils then push that air out. Lastly, frogs have gills that help take in oxygen and different gases when water is passed over them. They typically filter the bad gases out of the frog's system.

Amphibian lungs are ventral outpocketings of the gut, though they lie dorsal to it



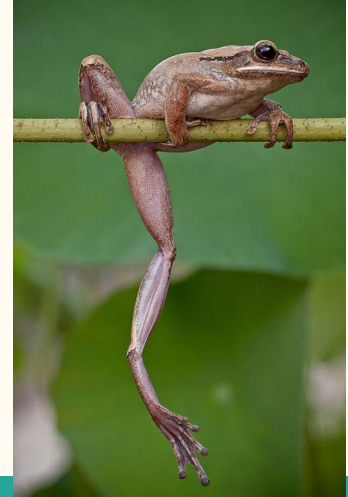
6. Explain how waste products are exchanged and transported in the frog.

The frog's skin serves as an additional organ for gas exchange. It must remain moist to carry waste products away from cells. The blood carries oxygen and nutrients to cells and carries waste products away. Then, the blood vessels provide a network of tubes to carry the blood through the body. This means that the wastes will never be in the frog's body. Plus, the structure of the frog's heart is so small that blood can only flow in one direction which means the wastes would only have one way to enter. Also, some frogs have small gills, which the oxygen from the water is diffused into the blood and keeps wastes out. At the same time, different waste gases are passed back out of the blood into surrounding water. Lastly, without the moist skin of a frog and the other small functions of it, the frog would have a harder time keeping gases out of its system.



7. What are the structural adaptations which allow the frog to live in its environment.

Frogs have many structural adaptations that are made to survive in their environments. The structure of the feet and legs vary among frog species and where they live. For example some frogs live in the trees while others live in water. Their feet and legs help them move quickly, catch prey, and escape from prey. Frogs are generally recognized as amazing jumpers and use that to their advantage for food and escaping. Also, their skin is unique because it can absorb water and oxygen directly through the skin. Plus, many frogs contain mild toxins that make predators think twice about wanting to eat them. Lastly, the skin of a frog is very permeable to oxygen and carbon dioxide, as well as water.



8. What are the adaptations to this system which benefit the frog's niche?

Like all amphibians, frogs are cold-blooded, meaning that their body temperatures change with the temperature of their surroundings. When temperatures drop, some frogs dig burrows underground or in the mud at the bottom of ponds. They hibernate in these burrows until spring, perfectly still and scarcely breathing. Wood frogs can live north of the Arctic Circle, surviving for weeks in a frozen limbo state. This frog uses glucose in its blood as a kind of antifreeze that concentrates in its vital organs, protecting them from damage while the rest of the body freezes solid. Frog's' skin is critical to their survival. Through it, they both drink and breathe. Frogs don't swallow water; they get all the moisture they need through their skin. They rely on the extra oxygen they absorb through their skin, especially when they're underwater. Plus they typically find shelter underground in moist soil.



Bibliography

- <http://www.brighthubeducation.com/science-homework-help/122457-frog-circulatory-system/?scrlybrkr=0ca09870>
- <https://www.kullabs.com/classes/subjects/units/lessons/notes/note-detail/2483>
- https://www.slideshare.net/mobile/nikeeme_v/circulatory-system-of-frog
- <http://www.wsfc.k12.nc.us/cms/lib/NC01001395/Centricity/Domain/8300/frogbodypartsandfunctions2014-140508154132-phpapp02.ppt>
- <https://useast-www.securly.com/broker.php?reason=&categoryid=2147483648&policyid=0&i2n=744241368&url=c3R1ZHkuY29tL2FjYWwRlbXkvbGVzc29uL2NpcmN1bGF0b3J5LXN5c3RlbS1paWktdGhlLWhlYXJ0Lmh0bWw=&rand=1733928146>
- http://biology-cp-j.mhs.groupfusion.net/modules/locker/files/get_group_file.phtml?gid=2060793&fid=11803048