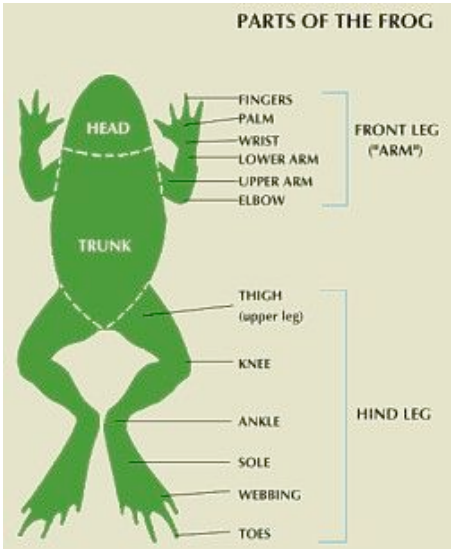
ANATOMY OF THE FROG: Lecture 3 Student Copy (5ec)

The body structure, or anatomy, of the frog is very similar to the anatomy of man. Both man and the frog have the same kinds of organs and systems of organs. The frog's anatomy, however, is much simpler.



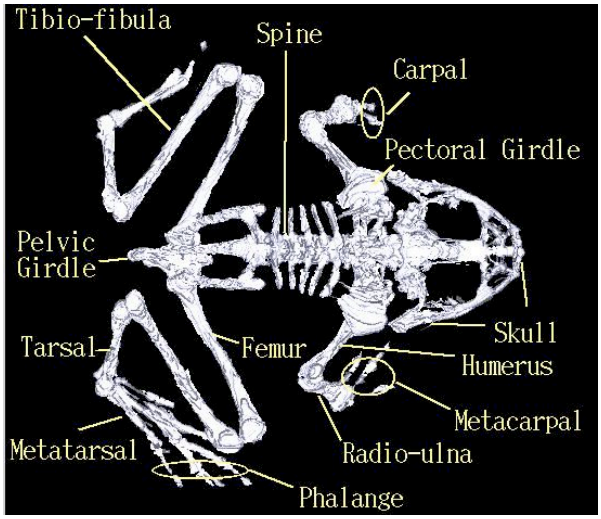
General Body Features

As in other higher vertebrates, the frog body may be divided into a _____

The flat head contains the brain, mouth, eyes, ears, and nose. A short, almost rigid neck permits only limited head movement. The stubby trunk forms walls for a single body cavity, the coelom. Man's internal organs are housed in one of three distinct hollow cavities--the chest, the abdomen, and the pelvis. The human chest is separated from the abdomen by a powerful muscular partition, the diaphragm. There is no such partition in the frog's coelom. All the frog's internal organs--including the heart, the lungs, and all organs of digestion--are held in this single hollow space.

The Skeleton and Muscles

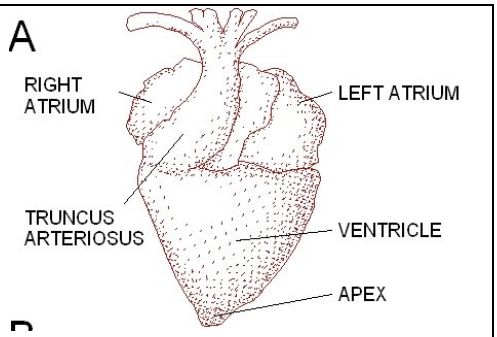
The frog's body is supported and protected by a bony framework called the skeleton. _____, except for an expanded area that encases the _____. Only ___vertebrae make up the frog's backbone, or vertebral column. The human backbone has 24 vertebrae. The frog _____.The frog does not have a tail. Only a spike-like bone, the **urostyle**, remains as evidence that primitive frogs probably had tails. The urostyle or _____ is a downward extension of the vertebral column. The shoulders and front legs of the frog are somewhat similar to man's shoulders and arms. The frog has one _____ the _____. Man has two forearm bones, the radius and the ulna. Both frog and man have one _____ the_____. The hind legs of the frog are highly specialized for leaping. The single _____ is the _____.



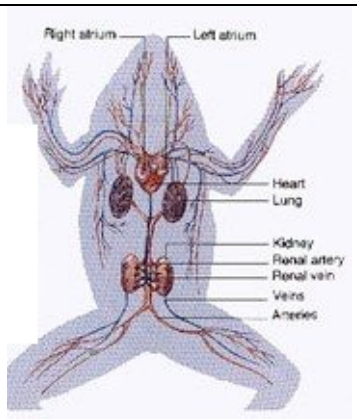
Man has two lower leg bones, the tibia and the fibula. In man and in the frog, the _____ is the single upper leg (thigh) bone. A third division of the frog's leg consists of two elongated anklebones, or tarsals. These are the _____. The astragalus corresponds to the human talus. The calcaneusin the human skeleton is the heel bone. As in other vertebrates, the frog skeleton is moved by muscles. Skeleton-moving muscles are made of skeletal, or _____. Internal organs contain smooth muscle tissue.

The Circulatory System

The frog heart is the only organ contained within the coelom which has its own protective covering. This is the _____. There are two upper chambers of the heart, _____ _____. The frog heart, however, has only one lower chamber, _____ _____ In man, the lower heart chamber is divided into two compartments, the right ventricle and the left ventricle. Oxygen-rich blood and oxygen-poor blood containing waste gases are present together in the frog ventricle at all times. The oxygenated and oxygen-poor bloods, however, do not mix. Such mixing is prevented by a unique arrangement of the frog's heart. Instead of "perching" on top of the ventricle, the right atrium dips downward into the ventricle. This causes oxygen-poor blood entering the right atrium to pass all the way down to the bottom of the ventricle.



Meanwhile, <u>oxygenated blood is received by the left atrium and enters the same single ventricle</u>. The pool of oxygen-poor blood at the bottom of the ventricle holds up the oxygenated blood and prevents it from sinking to the bottom. When the oxygen-poor blood flows from the ventricle into vessels leading to the lungs, the oxygenated blood tries to "follow" it.
The lung vessels, however, are filled with _____, blocking the oxygen-laden blood and forcing oxygenated blood to detour into the arteries. These carry the oxygenated blood to the tissues. Frog blood has both a _____.
The liquid plasma carries solid elements such as red blood cells and white blood cells.



The Skin and Respiratory System
The frog is covered by a soft, thin, moist skin composed of two layers, _____ _____. The skin does not merely protect the frog but _____An extensive network of blood vessels runs throughout the frog's skin. Oxygen can pass through the membranous skin, thereby entering directly into the blood. When a frog submerges beneath the water, all its respiration takes place through the skin. Oxygen is obtained directly from the water. The frog does not breathe through its skin alone.

Adult frogs have paired, simple, _____ As in man, air enters the body through two nostrils, passes through the windpipe, and is received by the lungs. The mechanism of breathing, however, is different in the frog from that in man. In humans breathing is aided by the ribs, the diaphragm, and the chest muscles. The frog has no ribs or diaphragm, and its chest muscles are not involved in breathing. _____
_____.
However, it may also breathe with its mouth closed. The floor of the mouth is lowered, causing the frog's throat to "puff out." When the nostrils open, air enters the enlarged mouth. Then, with nostrils closed, the air in the mouth is forced into the lungs by contraction of the floor of the mouth.