**Circulatory System**

The circulatory system includes:

* Heart
* Blood
* Veins, capillaries, arteries (blood vessels)
* Lymphatic system (we will look at the Lymphatic system when we examine the Immune system)

(The cardiovascular system includes the heart and the three types of blood vessels)

Heart

1. Mostly made of cardiac muscle
2. About the size of your fist
3. Almost in the center of your chest cavity
4. All mammals have hearts that have left side and a right side separated by a thick wall
5. Right side pumps oxygen-poor blood to the lungs
6. Left side pumps oxygen-rich blood to the body
7. Each side has an upper chamber, or atrium (pl. atria)
8. Each side has a lower chamber, or ventricle
9. Valves are flap-like structures located between atria and ventricles, and in places where large arteries enter the heart. As blood moves through the heart, these valves close so that blood cannot flow backward. The valves closing cause the sound of your heartbeat, lub-dub, lub-dub.

Blood vessels

1. Arteries – a blood vessel that carries blood away from the heart. Thick walls, smooth muscle. Each heart beat pumps blood into your arteries at high pressure. This is your blood pressure. Your pulse is the rhythmic change in your blood pressure.
2. Capillaries – tiny blood vessels that allow the oxygen—carbon dioxide exchange, and the nutrient—waste exchange, at the cellular level. Capillaries are only one cell thick and no cell in the body is more than 3 or 4 cells from a capillary.
3. Veins – a blood vessel that carries blood back to the heart. Valves in veins keep blood from flowing backward.

Two types of circulation

1. Pulmonary circulation – the flow of blood from the heart to the lungs and back to the heart through the pulmonary arteries, capillaries, and veins.
2. Systemic circulation – the flow of blood from the heart to all parts of the body and back to the heart

Blood

Adult has about 5 liters of blood made up of:

1. Plasma – the fluid part of blood; a mixture of water, nutrients, minerals, sugars, proteins
2. Platelets – tiny pieces of larger cells found in bone marrow. When you are cut or scraped, platelets clump together to reduce blood loss
3. White blood cells – fight pathogens (viruses and bacteria). Some become antibodies which identify pathogens.
4. Red blood cells – disk-shaped and do not contain a nucleus. They carry oxygen to cells via hemoglobin which is an oxygen-carrying protein.