

UNIT A: BIOLOGY

LIVING SYSTEMS RESPOND TO THEIR ENVIRONMENT

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Science 30 students are expected to know the major structures of the mammalian heart, blood flow and which areas contain oxygenated and deoxygenated blood. Because a fairly high number of students have or are currently taking Biology 20 and/or 30 the questions tend to focus on areas that allow students who have not taken these courses to do reasonably well. Examples of this approach will be explained throughout this Unit.

CHAPTER 1: THE CIRCULATORY SYSTEM

30–A1.1k

Describe the principal structures and associated blood vessels of the heart; i.e., ventricles, atria, septum, valves (specific names of valves not required), aorta, vena cava, pulmonary arteries and veins, coronary arteries

The Heart

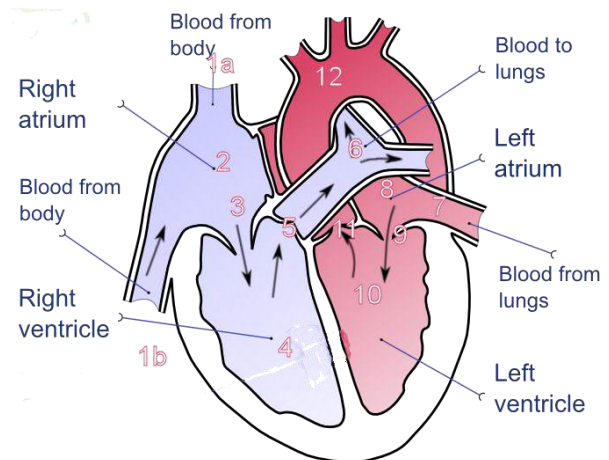
1a. Superior vena cava	7. The pulmonary veins
1b. Inferior vena cava	8. Left atrium
2. Right atrium	9. Left AV valve
3. Right AV valve	10. Left Ventricle
4. Right ventricle	11. The semi-lunar valve
5. The semi-lunar valve	12. The aorta
6. The pulmonary arteries	

Blood flow within the heart:

Vena Cava, Right Atrium, AV valve, Right Ventricle, Semi-lunar valve, Pulmonary artery, lungs, Pulmonary veins, Left Atrium, AV valve, Left Ventricle, Semi-lunar valve, Aorta

Deoxygenated blood is represented by blue.

Oxygenated blood is represented by red.




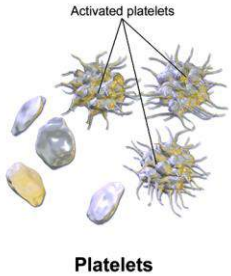
Modified by Robert Hempel © Manco Capac February 2008
https://commons.wikimedia.org/wiki/File:Ventricular_septal_defect-en.png

Remember – The orientation of a standard heart diagram is as if a person (and their heart) is facing you. Their left side is on your right side. Their right side is on your left.



Watch the video on The Heart Dissection



<p>White Blood Cells</p>	<p>Has a nucleus. Can have an irregular shape and can change shape to squeeze through capillaries walls.</p>  <p>© Cancer Research UK July 2014 https://commons.wikimedia.org/wiki/File:Diagram_of_a_white_blood_cell_CRUK_028.svg</p>	<p>The immune system response to infection and defective/cancerous body cells.</p> <p>Different types of white blood cells have different functions</p> <p>These cells and platelets can pass through a capillary wall.</p>
<p>Platelets</p>	<p>Irregularly shaped fragments originating from a larger cell. These are smaller than red and white blood cells.</p>  <p>Blausen.com staff. "Blausen gallery 2014". <i>Wikiversity Journal of Medicine</i>. DOI:10.15347/wjm/2014.010. ISSN 20018762. https://commons.wikimedia.org/wiki/File:Blausen_0740_Platelets.png</p>	<p>Forms blood clots to stop bleeding.</p>
<p>Plasma</p>	<p>The liquid portion of the blood</p>	<p>The transport of nutrients, hormones, gases, wastes, toxins, and medications.</p> <p>The distribution of heat.</p>

CHAPTER 2: BODY DEFENSE MECHANISMS

30–A2.1k

Describe how pathogens in the environment (e.g., mosquito-borne parasites, bacteria, viruses) enter the circulatory system and may have an adverse affect on health

Pathogen	Example and Treatment
<p>Bacteria Single-celled organisms</p>	<p>Example: <i>E.coli</i> Entry: Bacteria is found on and within the human body. Pathogenic bacteria can enter through food and water ingestion, through air passages and openings or breaks in the skin. These can enter the circulatory system. Treatment: Antibiotics and the immune system</p>
<p>Virus A non-living protein containing DNA or RNA</p>	<p>Example: <i>human immunodeficiency virus (HIV)</i> Entry: Viruses are found on and within the human body. Pathogenic viruses can enter through food and water ingestion, through air passages and openings or breaks in the skin. These can enter the circulatory system. Treatment: anti-viral drugs and the immune system. Some viruses cannot be completely eliminated after infection.</p>
<p>Fungi A multi-cellular organism with unique cell wall material</p>	<p>Example: <i>Athletes foot (Epidermophyton floccosu)</i> Entry: Fungus' are found on and within the human body. Pathogenic fungus' normally are spread through contact. These normally do enter the circulatory system. Treatment: anti-fungal drugs and the immune system.</p>
<p>Protozoa Mostly single-celled motile aquatic organisms</p>	<p>Example: <i>Plasmodium (group of malarial causing parasites)</i> Entry: Entry through breaks in the skin, ingestions and openings to the body. These can enter the circulatory system. Treatment: anti-protozoan drugs and the immune system.</p>