## **Exchange and transport**

The circulatory system can be divided into two systems known as; pulmonary circulation and systemic circulation. Systemic circulation transports blood from the heart to all other parts of the body and then back again to the heart. Whereas pulmonary circulation is a much shorter loop in which blood is only transported from the heart to the lungs and then back to the heart again. The heart is a vital organ within the circulatory system. It is commonly described as a hollow, muscular pump, which main function is to propel blood throughout the body. The average number of times the heart beats per minute ranges from 60 to 100 however when necessary it can beat much faster, an example being during exercise the heart would need to beat at a much faster rate as the bodies muscles will require nutrients at a higher demand, removal of waste products and delivery of oxygen at a faster rate and thus putting the heart under pressure to beat faster. On the other hand when sleeping, the heart pumps the minimal amount of beats per minute needed so the body is provided with a sufficient amount of oxygen when sleeping (Teachpe, 2017).

During exercise, oxygen is supplied to the muscles by the body. When oxygen is present, glucose is broken down into carbon dioxide and water. The body's muscles need oxygen for the respiration to be carried out. Respiration takes place through the gas exchange system and ventilation. There are two stages to ventilation; Inspiration and expiration. However the movements which occur during ventilation are controlled the intercostal muscles and the diaphragm. When a breath is taken air enters the body and travels down into the trachea. The trachea is split into two bronchi each belonging to each withe lungs. Bronchioles are small tubes which are the result of the bronchus splitting. At there would be alveoli. Alveoli wall are made up of epithelium cells and elasing these anow the alveoli to regain their original composition after inhalation has occurred with the air has travellem to the alveoli the oxygen diffuses into the blood, more specifically tell blood cells, where it binds or haemoglobin ready to be transported around the body (Shaevire, 2017).

Blood is transported around the body through different types of blood vessels. From all the blood vessels, arteries are the thickest. They are comprised of muscular walls which contract and relax in a manner in which prevents the backflow of blood to the heart. Arterial walls have three layers; the endothelium, the media and the adventitia. As the blood passes through an artery the endothelium provides a smooth surface lining for the flow of blood as it passes through the artery, the endothelium is the innermost layer of an artery. The middle part of an artery is the media; it is comprised of a layer of elastic tissue and muscle. Outside an artery is a tough covering which provides protection, this tough covering is known as the adventitia. During systemic circulation oxygenated blood is pumped to the aorta from the heart. Two major coronary arteries branch off at the aorta and then divide into a network of smaller arteries which supply oxygen and nourishment to the heart muscles. The pulmonary artery is another major artery of the body, it is divided into "right" and "left" pulmonary artery; its function is to carry deoxygenated blood from the right ventricle, to the lungs where the blood s supplied with oxygen. As arteries get farther away from the heart, they begin to branch out into arterioles; these are significantly smaller and less elastic than arteries (Teachpe, 2017).

Veins are another type of blood vessel; the two largest veins within the body are superior and inferior vena cava. Unlike arteries, veins carry deoxygenated blood back to the heart. The pulmonary vein is an exception to this rule; this particular vein carries oxygenated blood instead of deoxygenated blood, from