



Inquiry Approaches

Initial Inquiry

What are some functions of the circulatory system?

The main function of the circulatory system is to deliver oxygen to body cells and take carbon dioxide away from body cells. Blood also transports hormones and nutrients. The circulatory system regulates body temperature, helps the body dispose of waste products and protects the body from disease.

How do the heart and the lungs interact?

When you inhale, air enters the lungs. The lungs are surrounded by a vast network of capillaries. Oxygen from the air diffuses into the blood in the capillaries. The oxygenated blood is then transported to areas of the body where it is needed, such as muscles. Oxygen diffuses into working cells to help provide energy for respiration. Deoxygenated blood travels back to the heart and is then pumped to the lungs, where it is oxygenated again.

Experimental Procedure Inquiry

Why is it important to alternate squeezing the chambers?

In the human heart, the left ventricle contracts an instant before the right ventricle. The *Cardiac Pop Pump* presents this in a step-by-step process so that it is easier to visualize the path taken by the blood throughout the circulatory system.

How does the lung activity mimic human breathing?

The bottle represents the thoracic cavity and the glove represents the diaphragm. Pulling the glove down represents the contraction and flattening of the diaphragm when you inhale, causing the balloon (lungs) to inflate. Pushing the glove up represents the relaxation of the diaphragm when you exhale, causing the balloon (lungs) to deflate.

In-Depth Inquiry

Why does your heart rate increase when you exercise?

When you exercise, your muscles are working harder and need more oxygen than when you are resting. Your heart pumps faster in order to transport more oxygen to the parts of your body that need it.

Would you expect a smaller heart or a larger heart to pump faster? Why?

Smaller hearts will pump faster than larger hearts. The smaller the heart, the less blood it can hold, so smaller hearts have to pump more often to get enough blood throughout the body.

Why is the wall of the aorta thicker than the wall of the other blood vessels?

The blood from the left ventricle is transported all around the body, therefore the wall of the aorta is thicker because it has to withstand higher pressures.