

You Gotta Have Heart

Simple STEM Activity

Purpose:	The purpose of this activity is to explore how the human heart works.
Standard(s):	<p>S7L2. Obtain, evaluate, and communicate information to describe how cell structures, cells, tissues, organs, and organ systems interact to maintain the basic needs of organisms.</p> <p>c. Construct an argument that systems of the body (Cardiovascular, Excretory, Digestive, Respiratory, Muscular, Nervous, and Immune) interact with one another to carry out life processes.</p>
Materials:	3 plastic water or soda bottles, 3 cups of water, red food coloring (optional), 4 flexible straws, scissors, tape, modeling clay or Play-Doh
Procedures:	<ol style="list-style-type: none"> 1. Place your three bottles on the table. Fill the first two with water to about 80% full. Leave the third one empty. Add some food coloring, if desired. 2. Take two of the flexible straws, stretching and bending them to create a 90-degree angle. Make a small cut at the end of one of the straws and slide one straw into the other straw, then tape up the joint. Repeat with the second set of straws. 3. Put both straws in the middle bottle with one end of each going into one of the other bottles. Place clay or Play-Doh around the straw bases on the first and middle bottles (the ones with liquid inside) to make an airtight seal. 4. To make your heart model work, squeeze the middle bottle only. Then, pinch the straw between the first and second bottle while squeezing the middle bottle. Repeat until the blood in the first bottle gets too low.
Science Behind It:	<p>The human heart is a muscle located a little to the left of the middle of your chest. This muscle, about the size of your fist, is the key component of your cardiovascular system because it circulates blood throughout your body. Working together with your body's other main organ systems, the heart delivers oxygen and nutrients to your body while carrying away waste in your blood.</p> <p>The heart works as two pumps in one. The right side of your heart receives blood from the body and pumps it to the lungs to be oxygenated. The left side of the heart receives oxygenated blood from the lungs and pumps it out to the body. Blood only flows through the</p>

	<p>heart in one direction, so the heart's valves are critical for ensuring this one-way blood flow.</p> <p>In our model, when you squeeze the middle bottle, you are mimicking the contractions of the heart muscle when it pumps blood from the different chambers of the heart, then to the body. Pinching the straw acts like a one-way valve.</p>
Questions to Ask:	<ol style="list-style-type: none">1. How does the heart work?2. How does the cardiovascular system work with other organ systems?