



## Curiosity Guide #505

### Circulatory System

Accompanies Curious Crew, Season 5, Episode 5 (#505)

#### Balloon Valves

Investigation #2

#### Description

Valves are very valuable, especially the ones in your heart!

#### Materials

- Balloons
- Straws
- Cup of water
- Scissors
- Disposable latex glove
- Tape

#### Procedure

- 1) Cut a small hole in the tip of a latex balloon.
- 2) Push the end of a straw through the hole so that the balloon grips the straw tightly.
- 3) Fill a cup  $\frac{3}{4}$  full of water.
- 4) Place the balloon down inside the water so that the open straw is above the glass.
- 5) Challenge a friend to blow bubbles through the straw into the glass.
- 6) Now challenge your friend to try to drink through the straw.
- 7) Which is easier, blowing bubbles or drinking through the straw?
- 8) Now cut the finger off a disposable glove.
- 9) Pierce a tiny hole in the tip of the cut-off finger with the scissors.

- 10) Carefully slide the tip of the glove down, 1 to 2 centimeters, inside one end of another straw.
- 11) Fold the remaining part of the glove finger down over the opening of the straw.
- 12) Place the open end of the straw in the water.
- 13) Again, challenge your friend to try to blow bubbles into the cup by putting the end of the straw with the piece of glove in his or her mouth.
- 14) Again, have your friend try to drink from this straw.
- 15) Which is easier? Why?

My Results

## Explanation

In both examples, air can be pushed through the balloon or latex glove so that air bubbles can be observed in the glass. However, each time you try to drink, the pressure going the other way causes the balloon to collapse and limit the amount of water that can enter the straw. These are both examples of valves, which allow fluids to travel one direction but not the other. The heart has four such valves: the tricuspid valve, the pulmonary valve, the mitral valve, and the aortic valve. In each type of valve, the flexible membranes allow the blood to flow out of the chamber and then collapse and close to prevent the blood from going the wrong direction.

**Investigate further.** Locate a diagram or drawing of the human circulatory system in a book or on the internet.

Your circulatory system is made up of several parts that work together. These include the heart, blood, blood vessels, and a loop through the lungs where blood gets oxygenated. The job of the circulatory system is for the blood to deliver food and oxygen to all the cells of the body and carry out carbon dioxide and other waste materials. All of that blood gets pushed along by your heart muscle and carried through the blood vessels that include arteries, capillaries, and veins.

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