



## Curiosity Guide #505

### Circulatory System

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

#### One-Way Flow

Investigation #1

#### Description

See how our amazing hearts pump blood!

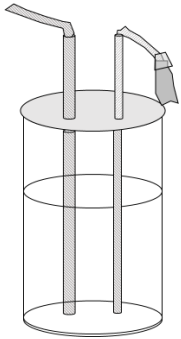
#### Materials

- Rigid plastic jar with a wide mouth
- Water
- Latex balloon
- Scissors
- Toothpick or wooden skewer
- 3 flexible straws
- Tape
- Shallow basin
- Paper towels

#### Procedure

- 1) Fill the jar  $\frac{3}{4}$  of the way full of water and set aside.
- 2) Cut off the neck of the balloon with scissors and save both parts.
- 3) Stretch the balloon over the mouth of the jar so that the balloon stays secure. You may add tape if necessary.
- 4) Use the skewer or toothpick to poke two holes in the stretched latex. Be sure to keep several centimeters between the holes.
- 5) Carefully slide one of the straws through one of the holes so that the bottom of the straw is submerged in the water.

- 6) Slide a second straw one centimeter into the neck of the balloon.  
Tape the straw in place.
- 7) Flex the straw down a bit so the attached balloon hangs downward.
- 8) Slide the second straw into the second hole until the base of the second straw is also submerged in water.



- 9) Place the entire assembly into a shallow basin.
- 10) Press down on the top of the stretched balloon.
- 11) What happens?
- 12) Remove the straw with the balloon and replace with a third straw without a balloon.
- 13) Test the assembly again. How is the result different?

My Results

## Explanation

The human heart has four chambers where blood enters and is pumped out. However, amazingly, the flow of blood only happens in one direction. This is because each chamber has a valve that lets blood go one way and not the other. These valves are flexible membranes that collapse after the blood passes through them and then form a barrier, so the blood can't go backwards. In our example, the cut balloon lets water flow out, but the balloon also collapses on itself and doesn't let the water flow back down the straw. When we substitute the third straw without the balloon valve, there is nothing to prevent the water from going back into the straw.

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