



WOW Program Lesson Plan

How the Heart Pumps!

Program Duration:

30 minutes

Recommended Grade**Levels:**

Grades K-5

Materials Needed:

- Small jar
- 2 bendy straws
- Balloon
- Tape/glue
- Water
- Red food coloring (optional)

Learning Objectives

1. Children will begin to understand the basics of how the the heart pumps blood

Preparation

- Discuss how all humans need blood to live
- Discuss the importance that blood goes all throughout our body
- Introduce the idea that hearts are the main organ that gets blood throughout the body

Background

The heart pumps blood throughout our entire body so that we can survive. Blood carries essential nutrients from the top of our head all the way to our toes. Every part of the body needs to have blood flowing through it. This is a pretty big job! The heart is one of the key players in this huge task. The heart is made up of two pumps. The right side of the heart takes blood from the body and sends it over to the lungs in order to get oxygen (what we get from the air we breathe!). The left side takes the blood from the lungs and sends it all over the body. In today's activity, we will make a pump that demonstrates how one side of the heart works to send blood where it needs to go. The balloon on the end of the straw inflates or delates depending on whether the heart is being pumped, which mimics the way that the valves in the heart are opened or closed. This is what pushes the blood up the open straw, similar to how blood is pumped out/in within the heart.

Activity**Set-Up:**

1. Fill a jar/cup halfway up with water and add the red food coloring
2. Cut the neck off of the balloon
3. Pull the balloon over the jar, so that is it taut like a cover on the jar
4. Using a sharp toothpick, poke two holes in the top of the balloon about an inch away from each other (keep the holes as small as possible)
5. Insert the straws into the holes (1 straw into each hole) with the bendy part up (outside of the jar)
6. Using the neck of the balloon that you cut off, cover one of the openings of the straw

Experiment:

1. If possible, place the set up into a second container (like a plastic storage bin) to catch the water that shoots out of the straw and prevent messes

2. Have the child press down onto the balloon covering the cup (strong & steady pumps work best)
3. The “blood” should shoot out of the open-ended straw

Additional Questions

1. What happens if we remove the balloon from the top of our straw? Does the blood still move?
2. What would happen if our heart only sent blood out to the body and didn’t bring blood back in?
3. What happens if we cover the top of both straws?

Summary

While this is a simplified model, the heart is a complex pump system. It has a big job to move blood throughout the body, and the pumping action is the way it does it. The movement of blood depends on what valves are open versus what valves are closed. Our experiment today displays the movement of blood through the two valves similar to in our heart.

Extended Exploration

- Make a DIY Stethoscope: <https://team-cartwright.com/diy-stethoscope-for-kids/>
- Make a Working Lung Model: <https://team-cartwright.com/working-lung-model-for-kids/>
- How the Heart Works: https://www.youtube.com/watch?v=Vot7V7_2UoI