

Heart Demo - 11/10:

Introduction by Daniel, Chelsea, and Emily

1. Do you remember why we need blood? (Chelsea)
 - a. What gets blood around the body?
 - b. What is the heart? Where is the heart in your body?
 - i. Middle of chest between two lungs.
 - c. How big is it?
 - i. Fist size
 - d. How much does it weigh?
 - i. 7-15 ounces. Weight of a juice box or soda can
2. What do we use to know our heart is working? Have you ever been to the doctor? (Daniel)
 - a. Can you hear or feel your own heart rate?
 - i. How fast?
 - ii. What about when you exercise?
 1. Faster or slower ?
 - b. How many times will your heart beat in your life?
 - i. 3 billion times
3. The heart is super important. (Emily)
 - i. Has anyone heart of a heart attack?
 1. A heart attack happens when one of the arteries carrying blood (and oxygen) to your heart is blocked.
 - ii. Demo with water and arteries.
 1. 2 beakers
 2. big tupperware
 3. 2 tubes

Now break into groups - segway by one of leaders saying we will focus on heart function and what happens when it does not work well.

4. Room analogy: 4 rooms - atria and ventricles (explain this well)
 - a. Heart pump model: (10-15 min)
 - b. <https://www.youtube.com/watch?v=xSaCIXgdg1U>
 - c. What we will make: <https://www.youtube.com/watch?v=pPjS52Ee9Jc>
 - i. [Instructions](#). Dont worry about covering one straw with the balloon. Use your finger to cover it up when pumping the heart. Have kids spray each other
5. Stent and clogged arteries:
 - a. Be sure to ask "What do you think clogs an artery?"
 - i. Fat and gunk in your bloodstream from eating badly and not exercising
 - b. Direct them by introducing materials: clogged vessel (small hole - point this out), clown balloons, rubber bands. (These will be prepared for you.
 - c. https://www.teachengineering.org/activities/view/cub_biomed_lesson03_activity1
6. Review questions:
 - a. Name the four chambers of the heart.
 - b. Why do your muscles need blood pumped to them?

c. What happens when an artery is clogged?

Heart Pump Model:(10-15 min)



1. Have kids stretch the balloon over the half filled bottle.
2. Use toothpicks to poke SMALL holes in the balloon to insert straws in. It must be airtight!
3. Cover one straw with your finger and point the other straw downwards.
4. Press on the balloon membrane to pump water out of the bottle
5. Explain this is like one chamber of the heart

Clogged Artery model



Won't run water through these tubes.

1. Ask them to remember what they noticed in the intro demo with clogged arteries
 - a. Point out how small the hole is
2. Lay out materials
 - a. Clown balloons
 - b. Pump
 - c. Rubber bands
3. Ask them if using the materials they can think of a way to make it easier for water to flow through the tube without touching the play doh themselves
4. Guide them to the answer if needed
5. Hold the connection between the balloon and pump tight for them as they pump.
6. Ask them to look at the whole again. Tell them real doctors use a technique like this.