



SciGirls



Discover the fun of science with your entire family!

Heart to Heart

The heart is the hardest working muscle in the human body, pumping out oxygenated, nutrient-rich blood with every beat. In this activity, you will build a stethoscope. Then, try comparing different ways to **measure your heart rate**, the speed at which the heart contracts and squeezes out blood. Have fun exploring how your family member's heart rates change with exercise!

Here's How:

1. Measure your resting heart rate with the pulse method first by placing an index and middle finger on the inside of your wrist, beneath the palm of your hand, and pressing down firmly. Count the number of beats for 10 seconds and multiply this by 6 to get the number of beats per minute (bpm) and record. For better results, sit quietly for a few minutes before taking your measurement.
2. Together, make a stethoscope by cutting off the bottom third of a water or soda bottle and inserting the vinyl tubing into the mouth of the bottle. Secure it with duct tape. Place the stethoscope on your chest and move it around to find the spot where the heart beats the loudest. Take turns listening and recording each family member's resting heart rate.



You'll Need:

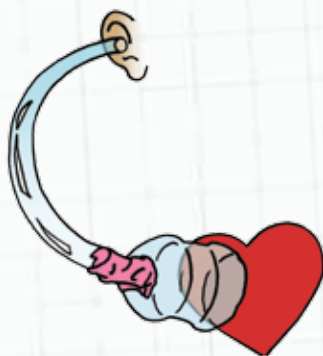
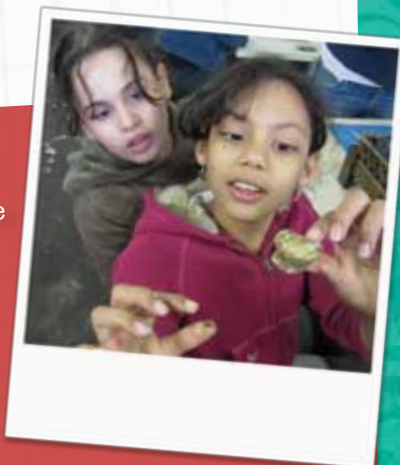
- ◆ 18 in. of vinyl tubing (from a hardware store)
- ◆ 1 empty plastic water or soda bottle
- ◆ scissors
- ◆ duct tape
- ◆ stopwatch or clock with a second hand
- ◆ paper and pencil
- ◆ rubbing alcohol
- ◆ cotton balls

POINTER: If you are struggling to hear the beat, try having the "patient" run in place for a few seconds before testing. Listen for the "lub-dub" sound—the heart valves closing to prevent blood from flowing backward.

3. How do the resting heart rates from these two methods compare? If you are physically able, try running in place for 1 min. and check your heart rate again. What happens?

Tips for Parents

At the most basic level, science attempts to answer how things work. The scientific process offers a framework for understanding important ideas, big and small. Scientists are professional question askers. Encourage your daughter's natural curiosity about the world, and let her know that it's perfectly acceptable not to have all the answers. Discovery begins with exploration! Visit pbs.org/parents/scigirls to learn more.



Wipe off the "earpiece" of the tubing with rubbing alcohol on a cotton ball before reusing.



Watch videos online at pbskids.org/scigirls.