February 2012 – Heart Science

Listen to your heart and learn why this fist-sized organ packs a powerful punch!

Hear Your Heartbeat

Have you ever heard your heart? How about someone else's? Doctors use an instrument called a stethoscope to listen to your heartbeat. In this experiment, you can listen to your heartbeat with a stethoscope like doctors use, or make your own simple stethoscope.

What You Will Need:

- A partner to help you
- Cardboard tube from a paper towel roll
- Stethoscope
- Stopwatch or minute timer
- Pencil and paper

What To Do:

1. Have your partner sit or stand still, so you can listen to their heartbeat. Place the stethoscope's sensor heard or one end of the cardboard tube on your partner's chest, slightly to the left. Place the earpieces in your ears. Or, if using a cardboard tube, put your ear up to the other end of the tube. Listen carefully. Do you hear a steady beat? Move the tube around until you can find the heartbeat.
2. Once you have found a steady heartbeat, set the stopwatch for one minute, and hand it to your partner. Start counting your partner's heartbeats as soon as your partner presses 'Start' on the stopwatch.
3. At the end of one minute, write down how many heartbeats you were able to count.
4. Have your partner repeat steps 1-3 while listening to your heart.
5. Now, have your partner exercise for 15 minutes. Examples of this are: jogging around the house, jumping on a trampoline, and walking up and down the stairs. The key is not what your partner does, just that the activity is continuous for 15 minutes without stopping for a break.
6. After 15 minutes of exercising, measure your partner's heartbeat, counting how many beats there are during one minute. Write this new number down. Is it different from the number before?

7. Now it's your turn to exercise! Do the same activity that your partner did for 15 minutes without stopping for a break.
8. Once you've finished, have your partner count how many times your heart beats in one minute. Write the new number down.

What Happened?

Exercise makes our heart beat faster. When our bodies are working harder, we need a steady blood supply. Our hearts provide blood to all parts of the body, even our brains! When we exercise, it also exercises the heart! Our hearts have to work a lot harder to pump blood while we are exercising. Our blood contains oxygen, which we need during exercise. As we use up the oxygen that our blood supplies, our heart has to keep pumping new blood into our system. Even after you were done exercising, your heartbeat was still faster than normal. This is because as your body cools down, you still need a strong oxygen supply. You can try the experiment again with less exercise (5 minutes) or more exercise (30 minutes). What are some times when your heart beat really fast? Why do you think that is? Sometimes something scary like riding a rollercoaster will make our hearts beat fast.

Fun Facts

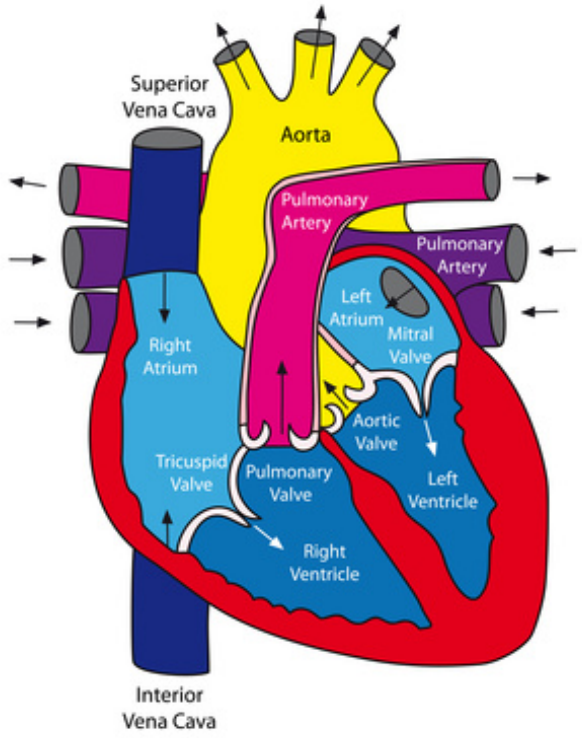
- Make a fist. Your heart is about the same size as your fist. Adults' hearts are about the size of two of their fists.
- Squeezing a tennis ball requires approximately the same amount of force it takes your heart to pump blood out to your body.
- The human heart beats about 100,000 times a day, which is 35 million times in a year and 2.5 billion times throughout your life!

Silly Science

- Why did the skeleton fail the test?
    - Because his heart wasn't in it.
- **Doctor:** Nurse, did you take the patient's temperature?
    - **Nurse:** No, why? Is it missing?

Way Cool Websites

- Perform virtual heart surgery, including a heart transplant operation!
- Read five ways exercising your heart can improve your day.
- See how much you know about your heart with this cardiovascular quiz.



Teaching Tips

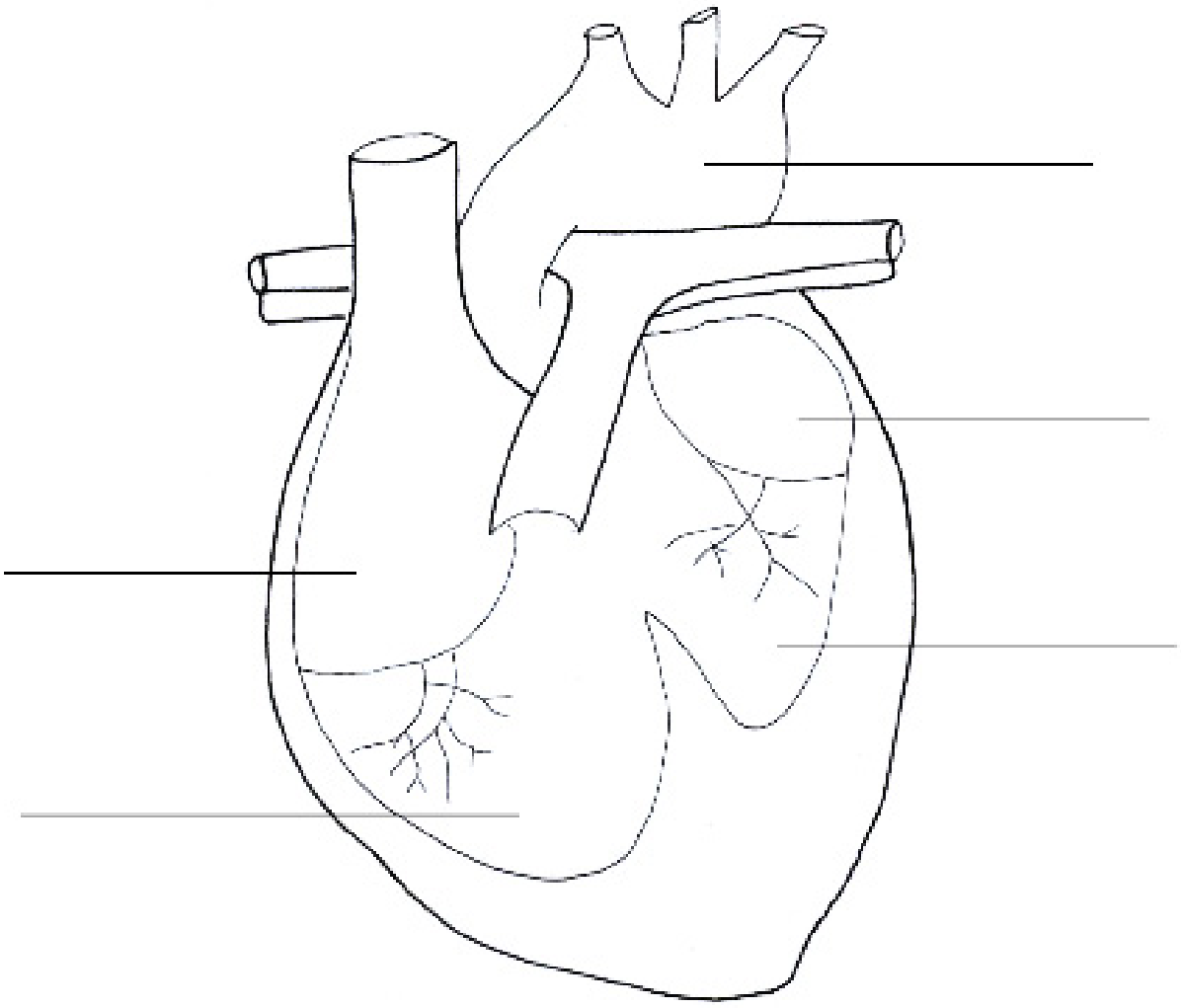
Human hearts have four chambers and work as a pump delivering blood to your body. Deoxygenated blood—which needs a fresh supply of oxygen—is brought by veins in from the body into the first chamber, known as the *right atrium*. The heart them pumps the blood into the *right ventricle*, and from there it is pumped to the lungs. In the lungs, the blood receives oxygen. From the lungs, the oxygenated blood is brought back to the heart. The blood passes through the *left atrium* into the *left ventricle*, and from there it is pumped through your arteries to the rest of the body. Complete the heart worksheet to test your knowledge of the five basic parts of the heart.

The largest artery in the body is the aorta and it's located above the left ventricle. This process of moving blood through the body is called circulation and it repeats itself all day, every day throughout your life! When you were exercising, you needed more oxygenated blood, so your heart had to work harder! That's why it beat faster after exercise. The sound of your heartbeat is the sound of valves in your heart closing. Valves act like doors in your heart, controlling how much blood goes in and out.

Blood's circulation path: body >> veins > > right atrium > > right ventricle >> lungs >> left atrium >> left ventricle >> arteries >> body

The Human Heart

Label the parts of the heart below by choosing from the listed options. After you label each part, color the diagram. A lot of pictures of human hearts use red and blue, but you can use any colors you like to illustrate the different parts of the heart.



a. aorta
b. right ventricle
c. left atrium
d. right atrium
e. left ventricle

Visit homesciencetools.com to learn more about your heart!