Discovering Vital Signs

Both breathing and heartbeat are important signs of life. Our heart and lungs work together to keep us alive and healthy. You can see or feel breathing movements of the abdomen or chest. Exhaled air can be felt. You can feel or hear a heart beating. Your children will enjoy finding out about the heart, blood vessels, and lungs while they work with you to investigate their own vital signs.

Teach Your Children To

- Locate and check breathing and heartbeat
- Locate and count their own pulse
- Identify the heart, lungs, and blood vessels
- Use new words such as exhale, inhale, heart, lungs, oxygen, pulse, artery, vein

You Will Need

✓ Watch or clock with a second hand
✓ A Body Poster, (on page 5)
✓ Washable, ink felt pen
✓ Masking tape
✓ A 16 oz. paper cup with the bottom removed

Activity 1 Checking for Breathing

1. Show your children how to feel for breathing at the nose. Explain that placing the back of one hand just in front of a person's nose is another way to check for breathing. Demonstrate the method on yourself (with your mouth closed), then have them try it on themselves. Encourage them to describe their observations.

2. Invite your children to check their own breathing. Explain that they will sit quietly with their eyes closed, and a hand over their "belly button," so they can feel the way their abdomen moves during breathing. When they are ready, give them a signal to begin. After about 30 seconds, ask them to describe what they felt. Ask them what might cause the abdomen to move in and out during breathing.

3. Show them the Body Poster, and together locate the lungs on the diagram. Explain that when a person breathes in (inhales), the air goes to the lungs and the lungs get bigger. When the person breathes out (exhales), the lungs get smaller. The muscles of the chest and abdomen move when we breathe. Tell the children that when we inhale air we bring oxygen gas to our lungs. Oxygen is necessary for life.

Activity 2 Listening for Heartbeats

1. Look at the Body Poster with your children, and point to the heart. Show them where to feel their own heartbeats by placing a hand over your own heart on the left side of your chest. Have them try to feel their own hearts beating. The heartbeat is easier to feel if they are wearing only one layer of clothing.

2. Direct your children to find the spot where they can feel their own heart beating. Then, place a piece of masking tape on that location so they can find the spot again.

3. Hold up the cup (with the bottom removed) and tell children it magnifies the sound of the heartbeat.

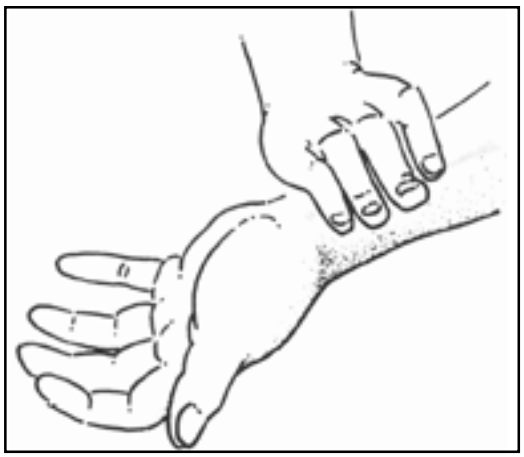
4. Demonstrate how to use the cup by pressing it against a child's chest and inviting another child to listen to the sounds. One child will be the "Patient" and will sit quietly as the "Listener" locates the heartbeat sounds. Point out that it is important to hold the cup steady so that no movement of clothing or the cup can be heard.

5. Give the "Listener" time to position the cup over the heartbeat sticker, and give a "Go" signal for listening. When about 30 seconds have passed, give a "Stop" signal and have the children switch roles.

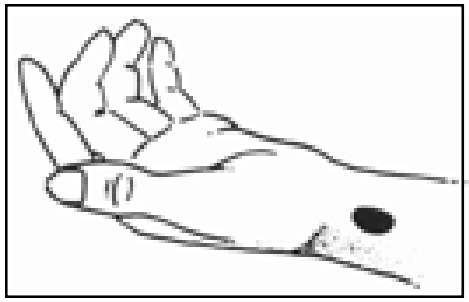
6. Ask the children to describe what the heartbeats sound like.

lub-DUB. . .
Two sounds, described as "lub-DUB," can be heard during every heartbeat. These are the sounds of the heart valves as they click shut. It sounds like: lub-DUB, pause lub-DUB…

Activity 3 Exploring Pulse



1. Explore pulse and blood vessels with your children. Ask, "What happens when you cut your finger or skin your knee?" [You bleed or see blood.] Point out the heart and main blood vessels on the Body Poster. Explain that each beat of the heart pushes blood to all parts of the body in tubes called **arteries**. Near the heart the arteries are big; they become smaller as they branch out to the arms and legs.



2. Invite children to look for blood vessels on the backs of their hands, and to describe what they see. Explain that these thin blue lines are veins that carry blood back to the heart. The Body Poster shows how the small arteries become very tiny tubes, called **capillaries**, that connect to veins enabling blood to flow back to the heart.

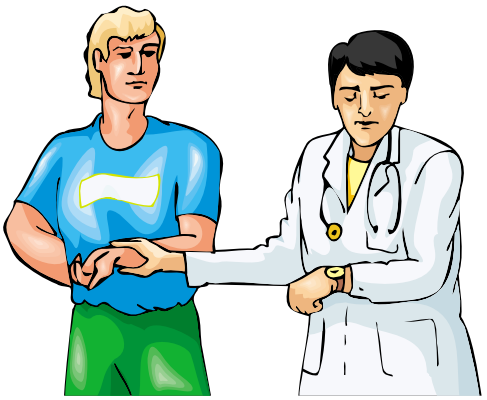
3. Introduce the term **pulse** and explain that it is a little wave or surge in the blood that is pushed through the arteries by a heartbeat. Ask your children where they might feel their own pulse. [Neck, wrist, temple, ankle.]

4. Demonstrate how to find the pulse at the wrist. Show your hand palm side up. Follow your thumb toward your arm and apply gentle pressure to the pulse point area around the wrist. If you don't feel a pulse, move your fingers gently around until you do.

5. Use a washable marker to make a dot on your wrist where you feel a pulse. Invite your child to feel your pulse. Then help her find a pulse on her own wrist, and have her mark the spot with a dot.

6. Practice finding each other's pulse at the wrist and on the neck below the ear lobe.

Activity 4 Counting Pulse
For Children 9 Years and Older



Teach your children how to measure heartbeat rate. This is the number of times a heart beats in one minute (60 seconds). Have your children practice counting pulses while you keep time. Compare the heartbeat rates before and after exercise.

1. At first, children have difficulty counting pulses for more than a few seconds. Have them practice counting for different lengths of time, such as for 10, 15, and 20 seconds. Take the role of time keeper, and give them a signal, such as, "ready, get set, go."

2. Have them try counting at the wrist and at the neck to find the place that is easiest for them. Try out several different counting periods, and compute heartbeat rate for each one. Work with the children to compare the results:

- Count for 6 seconds, then multiply by 10.
- Count for 15 seconds, then multiply by 4.
- Count for 20 seconds, then multiply by 3.
- Count for 30 seconds, then multiply by 2.

3. Encourage your children to use their math skills to compute their average resting heartbeat rate. Have them conduct 3 counts and record their results each time. Have them add the 3 counts together and then divide the sum by 3 to find the average.

4. Challenge your children to measure their heartbeat rates after different kinds of exercise. Have them compare these rates to heartbeat rates when they are sitting and lying down. Ask, "What happens to the heartbeat rate after exercise? After changing body position?"

Sample: 30-second counts

Count 1	36
Count 2	34
Count 3	+ 32
Add	102

Divide 102 / 3 = 34 heartbeats/30 sec.
Multiply 2 X 34 = 68 heartbeats/60 sec.

Note: *The heart beats faster with exercise to get more oxygen to muscles in motion. The heart beats slower when we lie down because muscles are less active.*

Body Poster

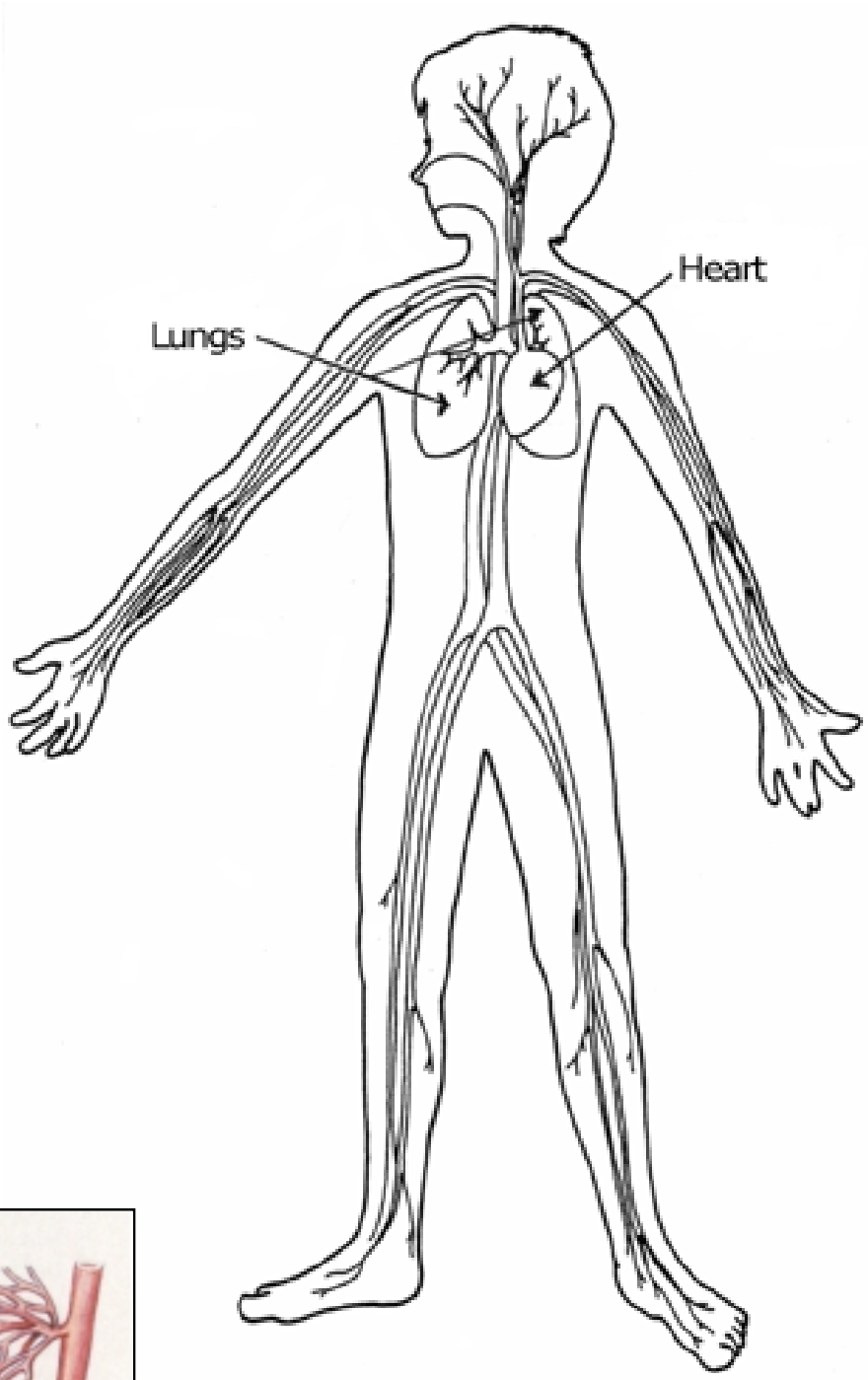
Your lungs inhale air rich in oxygen (O_2) and exhale air full of carbon dioxide waste (CO_2).

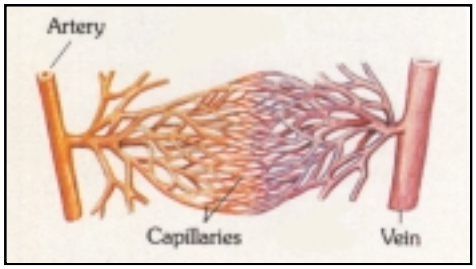
Your heart pumps blood rich in O_2 to all parts of your body through the arteries.

Capillaries are tiny tubes that connect the arteries and veins.

Veins return blood to the heart.

Then the heart pumps this blood (full of CO_2) back to the lungs where the CO_2 is exhaled.





Background Information for Parents

Our lungs and heart work together to keep us alive and healthy. When you take a breath, oxygen gas is brought into the lungs. Then it moves into the blood and is carried to the heart in blood vessels. The heart pumps the oxygen rich blood through arteries to the body. Veins carry oxygen poor blood back to the heart which pumps it to the lungs. Carbon dioxide, a waste gas of the body, is transferred from the blood to the lungs and exhaled through the nose and mouth.

The heart is the body's vital pump. Each heartbeat pushes blood through miles of elastic arteries, making them stretch. Between beats they shrink until the next beat stretches them again, causing a wave along the arteries. These **pulses** can be felt in the areas where the arteries are close to the skin, such as at the wrist and neck.

An 8-10 year old child's resting pulse rate is usually about 90 beats per minute, though normal rates vary from 60 to 110 beats per minute. Within any group there will always be a variation in the pulse rates observed. Resting pulse rates much above 120 beats/minute or much below 50 beats/minute are uncommon and should be checked by a doctor. Measuring your resting pulse rate is a useful health indicator. Fever, for example, is usually accompanied by a rise in the resting pulse rate.

A child's heart is a muscle about the size of a small fist. The heart is the body's strongest muscle, working around the clock for a lifetime. It does not get tired because it rests briefly after each beat.

Many variables can influence a person's heart rate: age, physical activity, and health status, to mention a few. In children, the most frequent causes of rapid heart rate other than exercise are anxiety and fever.

It takes less than a minute to check someone's vital signs (breathing and heartbeat). A phone call can bring emergency aid in a matter of minutes. The key is knowing what to do and how to act quickly. When you dial 911, your location and phone number are automatically displayed on a viewing screen at an emergency agency so you can be quickly located. The first few pages of your phone book list other emergency phone numbers, as well as safety and first aid information.

Books for Children

Why Don't Haircuts Hurt? Questions and Answers About the Human Body by Melvin and Gilda Berger, Scholastic Question and Answer Series, Scholastic Inc., 1998. ISBN 0-439-08569-1

Me and My Body, by David Evans and Claudette Williams, Dorling Kindersley, Inc., New York NY, 1992. ISBN 1-56458-121-7

Hear Your Heart by Paul Showers, Let's-Read-and-Find-Out Science Series, HarperCollins, 2001. ISBN 0-06-445139-9

Web Site

http://www.americanheart.org /Health/Lifestyle/Youth