

## **Straight from the Heart**

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### **Objectives:**

(These objectives are adaptable for all grade levels.)

The main objectives of this mini-teach are to define and demonstrate the functions of the heart; observe the vibration of a match due to the pulsation of blood in the wrist; to construct a simple stethoscope and use it to listen to your heartbeat; to measure your heart rate (pulse); to compare your heart rate with your partner's heart rate; and to calculate the number of times your heart beats in one hour.

### **Materials Needed:**

#### **Heart Model**

one-half pear  
per student  
surgical tubing  
plastic spoons  
scalpels  
"heart" vocabulary

#### **Vibration Observation**

modeling clay  
paper match

#### **Stethoscope Models**

surgical tubing  
2 funnels per model  
modeling clay

### **Strategy:**

#### Heart Model

1. Have students turn pear upside down and remove seeds.
2. Cut out two hollow openings at the top and two larger ones directly under them to represent the four chambers in the heart.
3. Introduce the largest artery and the largest vein by inserting surgical tubing in proper positions.
4. Discuss function(s).

#### Vibration Observation

1. Insert the match into a very small piece of clay (the smaller the better).
2. Flatten the bottom of the clay.
3. Place your wrist, palm side up, on a table.
4. Place the clay on your wrist, and move the clay around on the thumb side of the wrist until the match starts to slowly vibrate back and forth.
5. Count the number of vibrations that the match makes in one minute.

#### Stethoscope Models

1. Have students work in pairs.
2. Cut the hoses for the stethoscopes into approximately 3 feet lengths.
3. Set out all the material on supply table.
4. Prepare a sample stethoscope. Slide the hose over the end of each funnel. Use clay to hold funnel in place.
5. Instruct students to be quiet because it will be very hard to hear the sound of a heartbeat if there is a lot of background noise and talking.
6. Have one student place one end of the funnel on his ear while the second student places the other funnel near the left side of the chest.
7. Have students listen to the heartbeats of themselves and partners using stethoscopes and compare rates.
8. Calculate the number of times your heart beats in one hour.

## **Performance Assessment:**

At the conclusion of the mini-teach, students will be able to answer the following questions:

### **Heart Model:**

1. How many chambers are in the heart?
2. What are the names of the chambers?
3. What are the functions of the chambers?
4. What is the name of the protective covering of the heart?
5. What is the name of the largest artery?
6. What is the name of the largest vein?

### **Vibration Observation:**

How many times does the match vibrates back and forth with a regular heartbeat?

(For adults it will vibrate 60 to 80 times in one minute.

The vibration for children is from 80 to 140 beats per minute.)

### **Stethoscope:**

1. Did you hear the "lubdub" sounds of the valves snapping shut with each heartbeat?
2. How do you think the stethoscope works?

### **Conclusions:**

Students will understand the functions of the heart and that as the heart contracts, blood is forced through the blood vessels. The blood moves at a rhythmic rate causing the blood vessels in the wrist to pulsate. All blood vessels have this throbbing motion, but the vessels in the wrist are close to the surface of the skin and can be felt more easily. The movement of the blood under the clay causes it and the match to vibrate.

The students will also understand through the use of the stethoscope that sound waves pass along the tube to the ear and that the funnel collects the sound made by the beating heart.

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