

Restart a Heart education resource

Make your own stethoscope



You will need:

- A cardboard paper towel tube
- Duct tape
- A small kitchen funnel

Instructions

1. Secure the cardboard tube to the kitchen funnel with the duct tape.
2. Listen to each other's hearts.

Discussion

1. What can you hear? Can you describe it? A heart usually makes a 'lub-dub' sound.
2. What difference might exercising make to the heartbeat?
3. Run, jump or move around and then listen to each other's hearts again. What do you notice?
4. How could you make the stethoscope better? What if you used a hose with a funnel at each end? Or different sized funnels? Which do you think would work best?

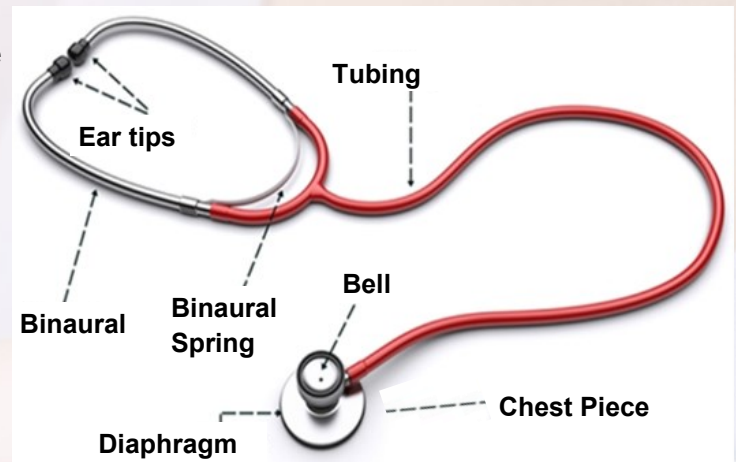
The Stethoscope

The stethoscope was first invented by a French doctor called **Rene Laennec**. His new invention helped him to hear bodily sounds more clearly but what he was trying to do was simply prevent having to put his ear next to dirty, smelly, lice-ridden bodies!

To understand the science of how a stethoscope works you need to know what the different parts are called.

The part of the stethoscope which captures the sound is the **chest piece**; this is made up of the **diaphragm** and the **bell**.

The **diaphragm** is the larger side which is a metal disc with a flat piece of plastic across it. You can simulate this by stretching a balloon over an item like a paper cup to create a 'drum'.

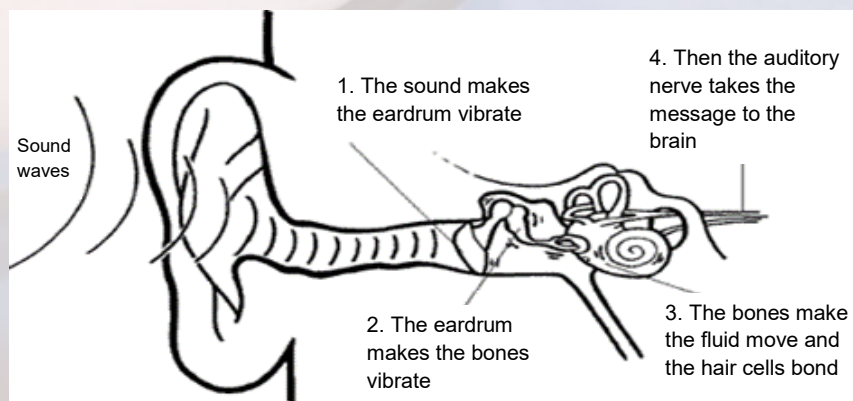


The **bell** is a hollow, bell-shaped piece with a tiny hole in it. The **bell** is much better at picking up low-pitched sounds.

The **tubing** is made up of rubber tubes in a Y-shape. These tubes run from the **chest piece** to the ear pieces. The sound that is picked up by the **diaphragm** or **bell** travels through a single tube before it splits in to two channels so it can be heard in both ears.

The sound waves travelling through the patient's body cause the **diaphragm** of the stethoscope to vibrate. Because this is connected to tubing, the sound waves are channelled up the tubing. The headset or ear pieces are where the rubber tubing ends. The tubing is connected to a set of metal tubes that are connected to the **ear tips**; these are made of a soft rubber, both for comfort and to create a good seal to block out any background noise.

The sound waves picked up by the **diaphragm** are transmitted up the tubing, bouncing off the inside walls (called multiple reflection). Each wave reaches the listener at the **ear tips** and then the eardrum.



Sound is essentially a disturbance in air pressure!

For instance if you strum a guitar string, the guitar string vibrates. The vibrations cause the air pressure to fluctuate. When these waves of pressure reach our eardrums, our eardrums vibrate which our brain interprets into noise. If you were to look at your eardrum, it is a diaphragm like the large part of the stethoscope chest piece.