Lung Capacity

This week I thought we would do a fairly simple experiment to help get all of the students of the area ready for school on Monday.

Always remember to ask an adult before performing any science experiment

Materials:
- 1 big plastic or glass bottle, such as a 2L pop bottle
- 500 ml (2 cup) measuring cup (a 250 ml measuring cup will work too).
- Your kitchen sink (it has to be pretty big)
- Water
- Permanent marker
- A small piece of cardboard or still plastic
- Plastic tubing

Procedure:
1. Fill your measuring cup with 2 cups of water. Pour this water into the plastic bottle.
2. Use the permanent marker and mark the water line on the bottle.
3. Continue steps 1 and 2 until the bottle is full of water.
4. Fill the sink at least ½ way with water.
5. Place the cardboard or plastic on top of the bottle (you could also use the lid of the bottle, but that might be a little bit harder to do). Quickly and carefully, turn the bottle over, while you hold onto the cardboard. Invert the bottle into the sink. Once it is inverted, you can remove the cardboard.
6. Take the plastic tubing and thread it into the open end of the bottle.
7. Take a really really big breath and blow as much air as you can into the tube. Be careful that the tube is not in your mouth when you take that really big breath.
8. Without removing the bottle from the water, determine how much air is in it (look at the 2 cup markings you made earlier).

Explanation:
You just measured your lung capacity, which is the amount of air your lungs can hold. It is really unlikely that you were able to expend every single little bit of air in your lungs. Normally, the amount of air you breathe in and out is not very much. When you exercise, your muscles need more oxygen and so you breathe much more heavily. If you exercise very hard, you get a lot closer to expelling your entire lung capacity.
A child has a smaller lung capacity than an adult, due to the differences in size. Other things can change your lung capacity. Exercising more can increase your lung capacity and so can playing a woodwind instrument.
Try turning this science demonstration into an experiment. Get a group of friends and family together. Use a science notebook to record your results. Record people's ages and activity level and then find out their lung capacity by having them complete the demonstration. If you are

testing more than one person, make sure you sanitize the plastic tubing with some rubbing alcohol. Compare the results between groups of people; athletes, non-athletes; by age, etc.
Happy Experimenting!
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