

Investigation 2

Breathing Balloons

Materials

- student record sheet on page 39, reproduced for each student
- overhead transparency of *The Heart and Lungs* on page 35
- 2-liter plastic soft drink bottles with the bottoms cut off
- small balloons
- large balloons
- rubber bands

Steps to Follow

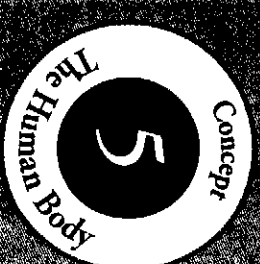
1. Show students the overhead transparency of the lungs. Explain what happens to the lungs and diaphragm during inhalation and exhalation.
2. Tell students to put their hands on their ribs in order to feel the way the rib cage moves up and out during inhalation and down and in during exhalation.
3. Group students in pairs. Tell them they will be making a model of the respiratory system to show how this process works.
4. Have students stretch the neck of the small balloon around the top of the bottle, so that the balloon hangs down inside like a lung. Tell them to secure the large balloon with a rubber band.
5. Students should then cut off the top of the other balloon and stretch it across the bottom of the bottle like a diaphragm, also securing it with a rubber band.
6. Tell students to hold the bottom balloon and pull it gently several times, watching what happens to the balloon inside the bottle.
7. Have students share their observations and conclusions with the class. Students should observe that when they pull down on the diaphragm, the lung expands. When they let go of the diaphragm, the lung deflates.
8. Help students conclude that pulling the rubber band is like stretching the diaphragm. Both cause inflation of the lungs. Letting go of the rubber band is like relaxing the diaphragm. Both cause deflation of the lungs.

Follow-Up

Have students draw diagrams of their respiration models during the inhalation and exhalation phases.

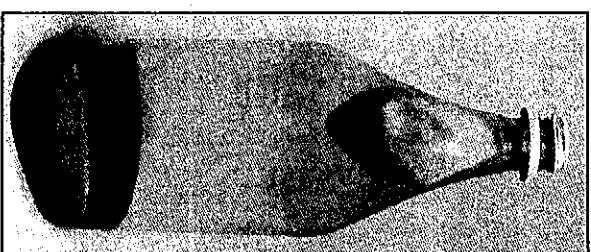
Name _____

Breathing Balloons



Procedure

1. Stretch the neck of the small balloon around the top of the bottle, so that the balloon hangs down inside. Secure the balloon with a rubber band. This balloon represents a lung.
2. Cut off the top of the large balloon and stretch it across the bottom of the bottle, also securing it with a rubber band. This balloon represents the diaphragm.
3. Before you do the next step, make a prediction. What do you think will happen to the lung if you pull down on the diaphragm?



Observation

4. What happens to the lung when you pull down on the diaphragm?

5. What happens to the lung when you let go of the diaphragm?

Conclusion

6. How is your model like an actual respiratory system?
