

How Your Lungs Work with a Balloon



Grade: 3rd Grade | **Topic:** How Your Lungs Work with a Balloon | **Measurement:** US Customary (cups, ounces, inches, etc.)

Purpose

To show how lungs fill with air when we breathe in and push air out when we breathe out. This experiment uses a balloon to help us understand how breathing works.

Hypothesis

If I pull on the bottom of the bottle, then the balloon inside will get bigger because it is like my lungs filling with air.

Materials

- 1 empty clear plastic bottle (16 ounces)
- 1 balloon
- 1 rubber band
- 1 large plastic bag (like a sandwich bag)
- Tape
- Scissors
- A bowl of water (optional for practice)

Procedure

1. Use scissors to carefully cut the bottom off the plastic bottle. Ask an adult to help.
2. Stretch the balloon to make it soft, then put the balloon inside the bottle through the top opening.
3. Pull the opening of the balloon over the mouth of the bottle so it is tight and secure.
4. Use a rubber band to hold the balloon tightly around the bottle's mouth so no air can get out there.
5. Stretch the large plastic bag around the bottom of the bottle you just cut off. Tape it so it is tight and sealed. This plastic bag will act like the diaphragm muscle.
6. Hold the bottle with one hand, and pull the plastic bag down with your other hand. Watch the balloon inside the bottle as you pull down.
7. Let go of the plastic bag and watch the balloon shrink.
8. Repeat pulling the plastic bag down and letting go a few times to see how the balloon changes size.

Results

When you pull the plastic bag down, the balloon inside the bottle gets bigger. When you let go, the balloon gets smaller again.

Conclusion

The balloon acts like lungs. Pulling the plastic bag down creates space inside the bottle, just like the diaphragm moving down makes space in your chest. This space lets air fill the lungs, making the balloon bigger. Letting the plastic bag go makes the balloon shrink, like breathing out.

Learning Objectives

- Understand how lungs expand and contract when breathing.
- Learn that air takes up space inside the lungs.
- Observe how muscles help the lungs work.
- Practice making a simple model of lung function.

Teacher Notes:

Key Concept: The lungs work by changing the space inside the chest. When the diaphragm muscle moves down, the chest gets bigger and air fills the lungs. When the diaphragm moves up, the chest gets smaller and air is pushed out.

Answer/Explanation: This model shows how the diaphragm controls breathing. Pulling the plastic bag down increases space inside the bottle, causing the balloon (lungs) to inflate. When the plastic bag moves back, the balloon shrinks because the space decreases, pushing air out.

Teaching Tips:

- Have an adult help with cutting the bottle to keep it safe. 2. Use different sizes of balloons to observe changes. 3. Encourage students to feel their chest and stomach while breathing to connect the model to their body. 4. Discuss why it's important to have healthy lungs and how exercise helps the lungs.

Relevant Standards: NGSS 3-LS1-1: Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death., NGSS 4-LS1-1: Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.



Name: _____

Date: _____

Experiment Title:

Purpose: *(I wonder...)*

Hypothesis: *(I think...)*

Materials:

Procedure:

Results: *(What happened?)*

Conclusion: *(I learned...)*