

Name: _____ Date: _____

The Leak-Proof Ziplock Bag Experiment

Objective:

Today, you will investigate why a ziplock bag full of water doesn't leak when you poke pencils through it.

Materials:

- 1 ziplock bag
- Water
- 2-3 sharpened pencils
- Towels or tray (for any spills)

Hypothesis:

What do you think will happen when you push a pencil through the water-filled bag?

Answer: Most students may predict that the water will leak out.

Procedure:

1. Fill your ziplock bag about $\frac{3}{4}$ **full of water** and **seal it tightly**.
2. Hold the bag up and carefully **push a sharp pencil through one side of the bag and out the other**.
3. Observe what happens. Does water leak out?
4. Try inserting more pencils—how many can fit before it leaks?

Observations:

Describe what happens when the pencil goes through the bag.

Answer: The water does not leak because the plastic bag seals around the pencil.

Why Does This Happen?

The plastic bag is made of **polymers**—long, flexible chains of molecules. When the pencil pushes through, the polymers stretch and create a tight seal around it, preventing leaks.

Follow-Up Questions:

1. **What surprised you the most about this experiment? Answer:** Answers will vary, but students may say they were surprised that the water did not leak.
2. **What do you think will happen if you remove the pencils? Answer:** The water will leak out because the hole is no longer sealed by the pencil.
3. **Can you think of other objects that might work the same way? Answer:** Rubber balloons, cling wrap, and certain types of silicone materials.

Take-Home Challenge:

Try this experiment at home and show a family member! See how many pencils you can fit before the bag starts leaking.

Bonus Question: Polymers are used in many everyday objects. Can you name three things made of flexible plastic or rubber?

1. **Answer:** Rubber bands
2. **Answer:** Balloons
3. **Answer:** Plastic wrap

Fun Fact:

Polymers are found in nature too! Spider silk, tree sap, and even DNA are made of polymers!