

## Photo Description



## Scientific Phenomena

This image demonstrates static electricity as an anchoring phenomenon. The balloon has been rubbed against hair or fabric, giving it an electric charge. This charge creates an invisible force that can attract or repel lightweight objects like the paper confetti. The electric force is strong enough to make small pieces of paper "jump" toward or away from the balloon, even when they're not touching it.

## Core Science Concepts

1. Forces and Motion: The balloon creates an invisible pushing or pulling force that can move objects without touching them
2. Static Electricity: Rubbing materials together can create electric charges that attract lightweight objects
3. Properties of Materials: Different materials (rubber balloon, paper) behave differently when charged
4. Cause and Effect: Rubbing the balloon causes it to gain electric charge, which effects how it interacts with other objects

### Pedagogical Tip:

Have students make predictions before demonstrating the balloon experiment. Ask them to draw what they think will happen, then compare their predictions to observations. This builds scientific thinking skills.

### UDL Suggestions:

Provide multiple ways to engage with this concept: visual demonstrations, hands-on exploration with balloons and paper, and kinesthetic activities where students can "be" the electrons moving around.

## Zoom In / Zoom Out

1. Zoom In: At the microscopic level, tiny particles called electrons are moving from one material to another when we rub the balloon. These invisible particles create the electric charge that makes the force.
2. Zoom Out: Static electricity is all around us in nature - it creates lightning during thunderstorms, makes our socks stick to our shirts in the dryer, and helps some animals like sharks detect other creatures in the ocean.

## Discussion Questions

1. "What do you think will happen if we bring the balloon closer to the paper pieces?" (Bloom's: Apply | DOK: 2)
2. "Why do you think some pieces of paper moved toward the balloon while others moved away?" (Bloom's: Analyze | DOK: 3)
3. "What other things in our classroom might be attracted to a charged balloon?" (Bloom's: Apply | DOK: 2)
4. "How is this balloon force different from when you push a toy car with your hand?" (Bloom's: Compare | DOK: 2)

## Potential Student Misconceptions

1. Misconception: "The balloon is magnetic like a magnet on the refrigerator"

Clarification: Static electricity and magnetism are different forces. Static electricity works on many materials, while magnets only attract certain metals.

2. Misconception: "You have to touch things to move them"

Clarification: Some forces, like static electricity, gravity, and magnetism, can push or pull objects from a distance without touching.

## NGSS Connections

- Performance Expectation: K-PS2-1 Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object
- Disciplinary Core Idea: K-PS2.A - Forces and Motion
- Crosscutting Concept: Cause and Effect

## Science Vocabulary

- \* Force: A push or pull that can make things move
- \* Static electricity: A special kind of force that happens when you rub certain things together
- \* Attract: When objects pull toward each other
- \* Repel: When objects push away from each other
- \* Charge: The invisible electric power that builds up on objects

## External Resources

Children's Books:

- Balloons and Static Electricity by David Dreier
- What Is Static Electricity? by Robin Johnson
- Forces and Motion by Peter Riley

YouTube Videos:

- "Static Electricity for Kids" - Simple demonstration of balloon experiments with hair and paper: <https://www.youtube.com/watch?v=yC2-363MIQs>
- "Bill Nye Static Electricity" - Fun explanation of how static electricity works in everyday life: <https://www.youtube.com/watch?v=LQWLYAHmhb4>