Can Magnets Float in the Air?

Estimated Time:
Prep: 5 min.
Activity: 15–20 min.

Introduction

Overview

Experiment: Students explore how **magnets** work and learn how to make them float.

Key Concepts: This experiment builds on students' existing understanding of **force**. Students will learn that magnets have a **north pole** and a **south pole** and that these poles **attract** or **repel** other magnets.

Lead-In

Review that force pushes or pulls objects into motion. Use a magnet, a paper clip, and a penny to demonstrate how the force of a magnet pulls certain metals toward it. Did the magnet attract both the penny and the paper clip? How did the magnet pull the paper clip without touching it? Explain that **magnetism** works over a distance. Could magnets also attract other magnets? How do magnets behave with other magnets?

Teacher Preparation

Lead-In Materials:
- Paper clips
- Penny
- Bar magnet*

Teacher-Provided Experiment Materials:
- Colored pencils or crayons

Try This! Materials:
- Bar magnet*
- 4 ring magnets*

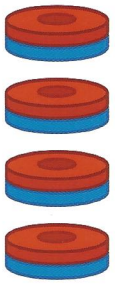
Prepare:
- Make copies of the Experiment Sheet.

**included in kit*

Vocabulary

- **attract** to pull or draw in
- **force** the push or pull that causes a change in an object's motion
- **magnet** a material that attracts certain metals, such as iron and steel
- **magnetism** the power to attract some metals, such as iron and steel, over a distance
- **north pole** the end of a magnet that points north
- **repel** to push away
- **south pole** the end of a magnet that points south

You Will Need

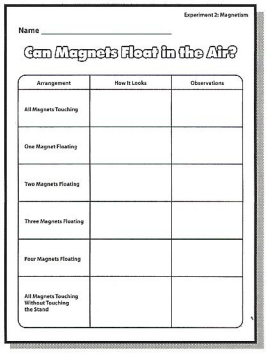


4 ring magnets

magnet stand

Teacher-Provided Materials

colored pencils or crayons



Experiment Sheet

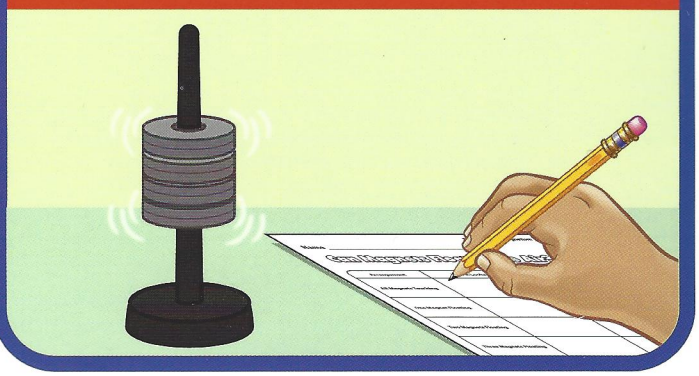
Procedure

1 Arrange the magnets on the stand so that all the magnets are touching. Draw the results and record your observations.

2 Arrange the magnets so that one is floating. Draw the results and record your observations.

3 Can you arrange the magnets on the stand so that two float? Three? All four? Draw the results and record your observations.

4 Arrange the magnets so that all four touch without touching the base of the stand. Draw the results and record your observations.



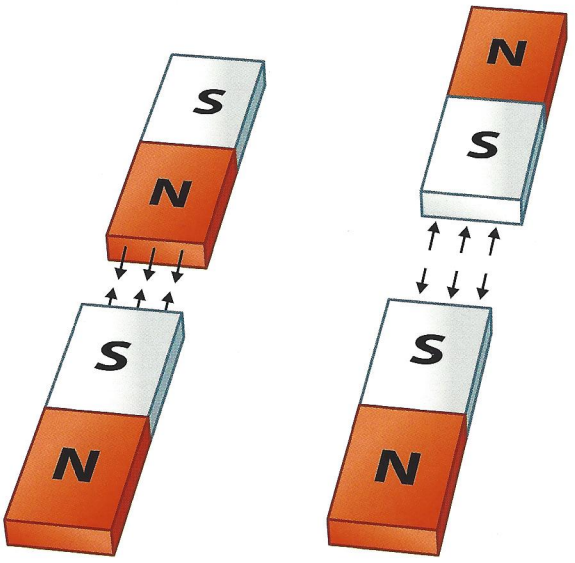
Name _____

Can Magnets Float in the Air?

Arrangement	How It Looks	Observations
All Magnets Touching		
One Magnet Floating		
Two Magnets Floating		
Three Magnets Floating		
Four Magnets Floating		
All Magnets Touching Without Touching the Stand		

Why?

Every magnet has two opposite poles: a north pole and a south pole. The force of a magnet is strongest at the poles. North poles attract the south poles of other magnets and repel the north poles. In the same way, south poles attract north poles and repel south poles. Earth is a giant magnet with a north pole on one end and a south pole on the other. This is why the needle of a compass always points north!



Unlike poles
ATTRACT

Like poles
REPEL

Discussion Prompts & Questions

- Which colors on the magnets repelled?
- Which colors on the magnets attracted?
- How did one magnet attract and repel the other magnets?
- If you knew the north and south poles of a magnet, could you predict how it and other magnets will behave?

Sentence Frames

- I was able to make the magnets float when _____.
- When opposite colors faced each other, the magnets _____.
- When the same colors faced each other, the magnets _____.
- I conclude that magnets _____.

Try This!

Help students learn how to identify the south and north poles of the ring magnets used in the experiment. Use the bar magnet to repel and attract the ring magnets to determine the poles. Which color of a ring magnet is north? Which is south? Have children explain how they arrived at their conclusions.