

Which Magnet Is Strongest?

Estimated Time:

Prep: 5 min.

Activity: 15–20 min.

Introduction

Overview

Experiment: Students measure how many magnetic chips each **magnet** can lift.

Key Concepts: Students will gain an understanding of **magnetic fields**, observing that they vary in **strength**.

Lead-In

Review what students already know about magnets. Remind them that a magnet is a piece of metal or a special type of stone that is able to **attract**, or pull, certain metals to itself. Explain that each magnet is surrounded by a magnetic field—the area around the magnet in which the **magnetic force** can be detected.

Demonstrate a magnetic field by placing a paper clip on a table and slowly lowering a magnet toward it until the paper clip “jumps” or is pulled up to the magnet on its own.

Hold up magnets of various sizes. Ask students if they think all the magnets have the same magnetic field. Are they all equally strong? Which magnet do they think is the strongest? Can they think of a way to find out?

Teacher Preparation

Lead-In Materials:

- Magnets of varying sizes, including refrigerator magnets
- Paper clip

Try This! Materials:

- Magnets of varying sizes, including refrigerator magnets
- Ruler*
- Paper clip

Prepare:

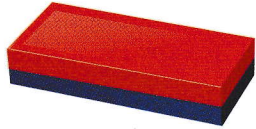
- Make copies of the Experiment Sheet.

**included in kit*

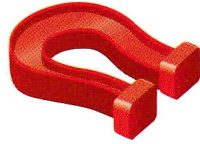
Vocabulary

- ◆ **attract** to pull or draw in
- ◆ **magnet** a material that attracts certain metals, such as iron and steel
- ◆ **magnetic field** the area around a magnet in which the magnetic force can be detected
- ◆ **magnetic force** the force that makes an object magnetic
- ◆ **strength** how powerful something is

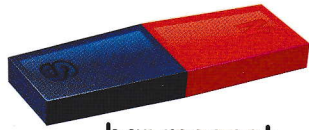
You Will Need



brick magnet



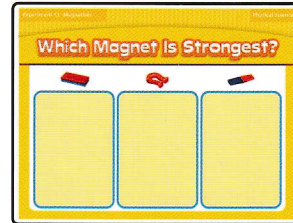
horseshoe magnet



bar magnet



plastic chips with metal rings



sorting mat

Experiment 13: Magnetism

Name _____

Which Magnet Is Strongest?

Magnet	Prediction (Circle one)	How many chips did it pick up?	Was my prediction correct? (Circle one)
Brick Magnet 	weakest stronger strongest		yes no
Horseshoe Magnet 	weakest stronger strongest		yes no
Bar Magnet 	weakest stronger strongest		yes no

Experiment Sheet

Procedure

1

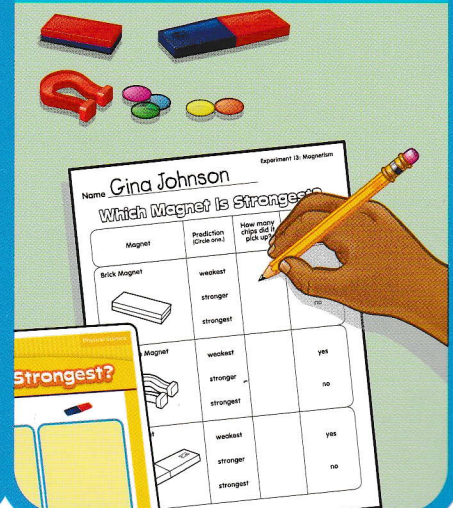
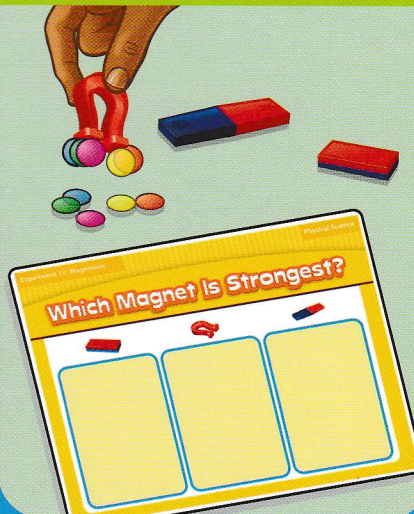
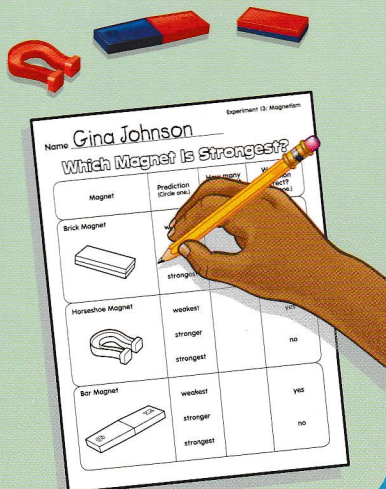
Look at the magnets.
Predict how strong each one is.
Record your prediction.

2

Test each magnet by using it to pick up as many chips as possible.
Place the chips on the sorting mat.

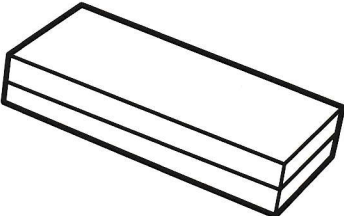
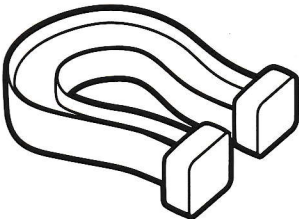
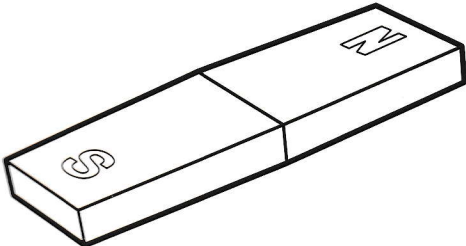
3

Count the chips that each magnet picked up.
Record your results.



Name _____

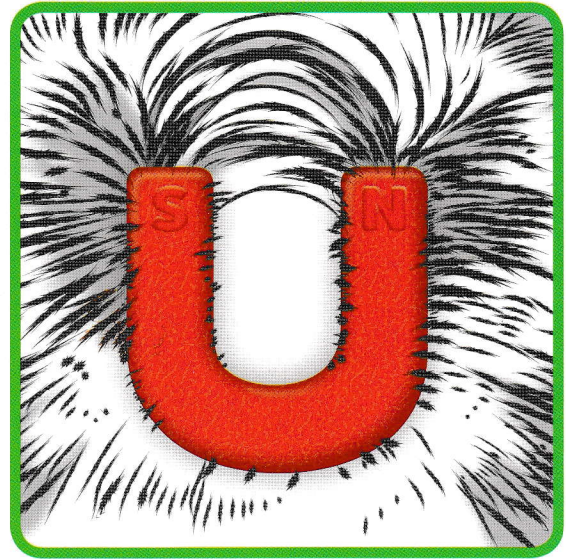
Which Magnet Is Strongest?

Magnet	Prediction (Circle one.)	How many chips did it pick up?	Was my prediction correct? (Circle one.)
<p>Brick Magnet</p> 	<p>weakest</p> <p>stronger</p> <p>strongest</p>		<p>yes</p> <p>no</p>
<p>Horseshoe Magnet</p> 	<p>weakest</p> <p>stronger</p> <p>strongest</p>		<p>yes</p> <p>no</p>
<p>Bar Magnet</p> 	<p>weakest</p> <p>stronger</p> <p>strongest</p>		<p>yes</p> <p>no</p>



Why?

All magnets are surrounded by invisible magnetic fields that run from one pole to the other. This is the area in which magnetic objects are attracted to the magnet. Stronger magnets have bigger magnetic fields, and can attract objects from farther away. The size of the magnetic field depends on several factors, including the shape and size of the magnet itself.



Discussion Prompts & Questions

- Does it matter how you hold the magnet?
- Does it make a difference if you touch the magnet to the chip or touch the chip to the magnet?
- Why do you think some magnets have different shapes?
- What do you think makes some magnets stronger than others?
- Can you think of something that uses magnets?



Sentence Frames

- I predict the _____ magnet will be strongest, because _____.
- The _____ magnet picked up _____ chips.
- From this experiment, I learned _____.



Try This!

- Put a paper clip at the end of a ruler. Slowly move different magnets toward the paper clip to see at what point the paper clip “jumps” to the magnet.
- Encourage students to use the magnets in other experiments. For example, do magnets attract other magnets? Do magnets work underwater? Can a magnet attract a magnetic object through a sheet of paper? What about cardboard? Help students work through their own experiments to answer questions about magnets.