Magnet Lab

Mid-Valley
STEM-CTE HUB

www.midvalleystem.org
midvalleystemctehub@linnbenton.edu
Linn-Benton Community College
Albany Campus - CC-212

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Magnet Lab

The Magnet Lab STEAM Kit allows students to explore the fascinating properties of magnets through hands-on experimentation. Using a variety of magnets—including round, rectangular, and colored types—along with lodestones, metal washers, and magnetic observation tools, students can investigate attraction, repulsion, magnetic poles, and field patterns. This kit fosters curiosity, scientific inquiry, and critical thinking as students test, observe, and document the behavior of magnetic materials.

Grade Level

K - 8th

Group Size

2 - 4

Time Duration

15-45 minutes

Content of Kits

Components

4 kits containing

- 10 round magnets
- 4 rectangle magnets
- 1 colored round magnet
- 1 polished oval magnet
- 1 magnetic pole identifier
- 1 magnetic particle viewer
- 1 stacking tool
- metal washers
- Lodestone pieces

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Usage

Getting Started

1. **Introduce the magnets:** Show students the different types of magnets and lodestones. Explain how each can interact with other magnets and metal objects.
2. **Set up the stacking tool:** Demonstrate how to use the stacking tool to safely handle and test multiple magnets at once, especially for observing repulsion and attraction in stacked configurations.
3. **Prepare the magnetic observation tools:** Give students access to the magnetic pole identifiers and magnetic particle viewers. Explain how to detect poles and visualize magnetic fields safely.
4. **Introduce experiments:** Encourage students to design their own investigations—such as testing which magnets are strongest, observing the effect of distance on attraction, or mapping magnetic fields with particles—while taking notes on their observations.

Storage

- Store all components are stored in the provided containers.
- Ensure all components are clean and dry before returning them to the storage bin.

Troubleshooting

- **Lodestones not responding:** Confirm the lodestones are free of debris and that nearby magnets are not interfering with tests.

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Activity Guide

Beginner

Magnet and Metal Interaction
Students use round and rectangular magnets with metal washers to explore attraction and repulsion. They can stack washers and test which magnets can lift them, noting differences in strength.

Intermediate

Magnetic Poles Exploration
Using magnetic pole identifiers, students investigate the north and south poles of each magnet. They record which poles attract or repel and experiment with lodestones to confirm observations.

Advanced

Magnetic Fields and Visualization
Students use magnetic particle viewers to observe the patterns of magnetic fields around different types of magnets. They can compare the field strength and shape for round, rectangular, colored, and polished oval magnets, noting how field lines differ between configurations.

Extension Activities:

Design a Magnetic Challenge
Students are challenged to create a task using magnets, washers, and lodestones—such as designing a magnetic levitation system, a pulley, or a stacking experiment—and document their results. This encourages creativity, hypothesis testing, and problem-solving.

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Learning Extensions

STEAM Connections: Engineering - Tech - Science

Learning Objectives:

- Understand magnetism concepts, including attraction, repulsion, and magnetic poles.
- Visualize magnetic fields using particle viewers.
- Develop observational, recording, and analytical skills through experimentation.
- Apply scientific inquiry by testing hypotheses and designing experiments.

Career Connections:

- **Physicist:** Studies magnetic fields, forces, and material properties.
- **Engineer:** Designs systems using magnetic principles, such as motors or sensors.
- **STEM Educator:** Teaches magnetism and physics concepts using hands-on exploration.
- **Product Designer:** Uses magnetism in design of interactive or mechanical devices.

Essential Employability Skills:

- Critical Thinking and Analysis
- Problem-Solving
- Experimentation
- Collaboration
- Communication
- Observation and Documentation
- Creativity
- Design Thinking

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Resources and Accessibility

Safety Guidelines

- Ensure all small pieces are kept away from mouths to prevent choking.
- Advise students on the strength and reactions of magnets to avoid injuries, like pinched fingers.
- Keep magnets away from electronics to avoid damage.

Accessibility

- Provide verbal and visual guidance on how to detect poles and use viewers.
- Allow extra time for students with fine motor challenges to manipulate magnets safely.
- Offer alternative observation methods (e.g., pre-drawn magnetic field diagrams) for students with visual impairments.

Library Catalog

Library Resources

Feedback

QR to feedback survey