

8th Grade Science Lab: Investigating Magnetic Fields

Objective:

Students will explore the properties of magnetic fields using simple materials. They will understand how magnetic fields interact with different materials and document their observations.

Duration:

30 minutes

Materials Needed:

- Bar magnets (1 per group)
- Iron filings (small container per group)
- White paper sheets (2 per group)
- Compass (1 per group)
- Safety goggles (1 per student)
- Plastic tray or shallow dish (1 per group)

Safety Precautions:

- Wear safety goggles to protect eyes from iron filings.
- Handle magnets and iron filings carefully to avoid spills and messes.
- Follow all school lab safety policies.

Lab Procedure:

1. **Introduction (5 minutes):**
 - Discuss what a magnetic field is and its importance in everyday life.
 - Explain the safety rules and the steps of the experiment.
2. **Experiment Setup (5 minutes):**
 - Place a bar magnet in the center of a plastic tray.
 - Cover the magnet with a sheet of white paper.
3. **Observing Magnetic Fields (10 minutes):**
 - Slowly sprinkle iron filings onto the paper over the magnet.
 - Gently tap the paper to help the filings align with the magnetic field lines.
 - Use a compass to observe how the needle aligns with the magnetic field at different points around the magnet.
4. **Documentation (5 minutes):**
 - Students sketch the pattern formed by the iron filings on their observation sheet.
 - Record observations about the direction of the compass needle.

5. Cleanup (5 minutes):

- Carefully fold the paper to return iron filings to the container.
- Clean the workspace following safety guidelines.

Reflection Questions:

1. What pattern did the iron filings form around the magnet?
2. How did the compass needle behave when moved around the magnet?
3. What do these observations tell you about the nature of magnetic fields?

Assessment:

- Observation sheets will be collected to assess students' understanding of magnetic field patterns.
- Reflection question responses will be used to evaluate comprehension and critical thinking.

Standards Addressed:

- **MS-PS2-1:** Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.
- **MS-PS2-3:** Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.

Teacher Notes:

- Ensure students understand the importance of documenting their observations accurately.
- Encourage students to hypothesize why the iron filings form specific patterns and discuss their thoughts.