Lesson 2.3
Investigating Ways Magnetic Force Moves Objects
Lesson Overview

Students deepen their understanding of magnetic force by finding that a magnet can attract or repel another magnet, but can only attract and not repel the metal objects moved by magnetic force. Students create and share various magnet tricks by using two magnets and a paper clip. As the class discusses the tricks, students are introduced to the terms attract and repel. Students read about magnetic forces, both attraction and repulsion, in the reference book *Handbook of Forces*. Pairs discuss, and students do a Quick-Write to reflect on the magnet tricks and their reading. The purpose of this lesson is to establish that magnets can attract or repel other magnets and can attract some metal objects.

**Anchor phenomenon:** The floating train rises, floats above the track, then later falls back to the track.

**Investigative phenomenon:** A magnet causes another magnet or a paper clip to move without touching it.

**Students learn:**

- A magnetic force can be an attraction or a repulsion.
- A magnetic force, like other forces, acts between two objects.
- Scientists often gather evidence from books to help them make sense of evidence they get from their own investigations.
Reading About Magnets in Handbook of Forces

In the *Handbook of Forces* reference book, students read about how magnets attract and repel objects.

### Instructional Guide

1. **Set purpose for reading and add to the Setting the Purpose for Investigating and Reading chart.** In the “Reading” column, write “Find out more about ways magnetic forces can make an object move.”

   Scientists often gather evidence from books to help them make sense of evidence they get from their own investigations.

2. **Distribute one copy of *Handbook of Forces* to each pair of students.**

3. **Distribute sticky notes.** Distribute one sticky note to each student and remind them to use the sticky notes to mark a piece of evidence related to today’s purpose for reading so it will be easier to locate when they share their ideas.

4. **Review glossary and bold words.** Remind students that they can find definitions for bold words in the glossary at the back of the book.

5. **Use the table of contents.** Remind students that the table of contents lists the topics of the book in the order they appear in the book. Have pairs use the table of contents to find the page to turn to so they can read about magnetic forces. [Page 14.] Have students read pages 14 and 15.

6. **Partner reading.** Students read pages 14 and 15 and mark evidence with sticky notes.

7. **Discuss reading.** Facilitate a brief class discussion, giving students an opportunity to share some of the new information they’ve marked in the text. [Magnetic force is a non-touching force. Magnets only attract other magnets or objects made of some kinds of metal. Magnets only repel other magnets.]
8. Connect to evidence about repelling from the magnet tricks. Point out that the class found evidence of magnets repelling magnets but not of magnets repelling the paper clip.

Teacher Support

Rationale

Pedagogical Goals: Purpose of Pairing Reading with Physical Investigation
What students read in the reference book, *Handbook of Forces*, is likely to confirm some of the important ideas they discovered through the magnet tricks, particularly that two magnets can attract or repel each other. Reading this information right after the physical investigation can help students solidify their understanding of these ideas. It also models the scientific practice of gathering evidence from more than one source.
Reading About Magnets in Handbook of Forces

In the Handbook of Forces reference book, students read about how magnets attract and repel objects.

Instructional Guide

1. Set purpose for reading and add to the Setting the Purpose for Investigating and Reading chart. In the “Reading” column, write “Find out more about ways magnetic forces can move an object.”

2. Distribute one copy of Handbook of Forces to each pair of students.

3. Distribute sticky notes. Distribute one sticky note to each student and remind them to use the sticky notes to mark a piece of evidence related to today’s purpose for reading so it will be easier to locate when they share their ideas.

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