



Gale In Context: For Educators – Lesson Plan

Magnetism

Date: 2022

From: Gale In Context: For Educators

Publisher: Gale, part of Cengage Group

Document Type: Lesson plan

Length: 973 words

Lesson Overview

Target Grade: 3

Grade Levels: 3-5

Subject: Science

Subject Area: Physical Science

Summary of Lesson: In this lesson, students perform a hands-on activity to investigate the magnetic forces of magnets on different substances and other magnets. Students identify a problem and design a solution that uses magnetic forces as part of the solution, then write an explanation that describes the problem and how the forces of magnets will be used to solve the problem.

Focus Question(s):

- How do magnets interact with other magnets?
- How do magnets interact with different substances?
- How are magnetic forces used in the world around us?

Lesson Type: Creative Thinking; Critical Thinking; Experiment; Inquiry; Literacy

Duration: 90 minutes

Materials Needed:

- **Demonstration Materials:**
 - Three round magnets
 - Play-Doh or molding clay
 - Marker or other cylindrical object that will fit in the hole of magnets
- **Student Materials:**
 - Bar magnets (preferably N and S poles labeled)
 - Round magnets
 - Horseshoe magnets (preferably N and S poles labeled)
 - Small objects of different substances (e.g., iron, copper, aluminum, wood, plastic)

Lesson Objectives

Students will be able to:

- conduct a scientific investigation to understand magnetic forces
- identify a problem and design a solution that uses magnetic forces
- write an explanation that describes how magnets are used to solve a problem



Learning Skills

- Comparing and contrasting
- Describing
- Designing
- Problem solving
- Questioning
- Science/technology literacy
- Summarizing

Lesson Sequence

Engage (5 minutes)

- Demonstrate a magic trick with magnets for students. Hide a magnet inside the palm of your hand and use the opposite poles to push another magnet taped under an index card away without touching it.
- Ask students to write down why they think this happened. Invite students to share their responses with a partner and the class.

Explore (25 minutes)

- Explain to students that they are going to investigate the forces between objects. Magnets are objects that have an invisible force.
- Ask students to think about how they use magnets in their daily lives. Invite students to share their responses.
- Have students work with a partner to investigate magnetic forces between magnets and different objects, including other magnets.
 - Students may want to try to repeat the floating magnet trick.
- Give partners bar magnets, round magnets, and horseshoe magnets. Have them investigate the following questions:
 - What objects can the magnet pick up? (Try different materials.)
 - How does the magnet react to another magnet that is the same? (Example: bar magnet N and bar magnet S, bar magnet N and bar magnet N, bar magnet S and bar magnet S)
 - How does the magnet react to other magnets that are different? (Example: bar magnet and horseshoe magnet)
 - As a virtual alternative, partners can explore magnets through a free online game such as [Magnet Hunt](#).
- Invite students to share their observations with the class.
 - What objects can the magnet pick up? Were some objects easier to pick up than others? Why do you think this happens?
 - How does a magnet react to another magnet that is the same? And what happens when you turn one over? Both over?
 - How does the magnet react to other magnets that are different?

Explain (30 minutes)

- Ask students to think about magnetism and complete the K and W of a [KWL chart](#).
 - K: What students think they know about magnetism
 - W: What students want to learn about magnetism
- Ask students to share responses with the class and record the information for everyone to see.
- Read aloud the "[Magnetism](#)" article from *Gale In Context*.
 - Highlight important information, ask questions, give examples, and summarize the information.
 - Students may not have learned about electrons yet, so some additional information may be needed in the "What Are Magnets?" section.
- Ask students to complete the L of their KWL chart.
 - L: What students learned from the text
 - Was the information from their K (know) accurate?
 - Did the information in the text answer the questions from their W (want to know)?

Elaborate (20 minutes)

- Ask students to make a list of problems that they have at home that could be solved using a magnet.
 - This can also be assigned as homework.



- Ask students to pick one problem from their list and sketch and label a plan.
- Have students write an explanation that includes a brief description of the problem and how the forces of magnets will be used in their plan to solve the problem.

Evaluate (10 minutes)

- Ask students to share their problems and design solutions with a partner. Invite them to share with the class.
- Students will be measured on their design solutions to their chosen problems, as well as their explanations.

Sources

Levit, Joe. "Magnificent Magnets." *National Geographic Explorer: Pioneer*, vol. 15, no. 7, May 2016, pp. 10+. *Gale In Context: High School*, https://link.gale.com/apps/doc/A451229435/SUIC?u=icfe_news&sid=bookmark-SUIC&xid=b07cbc43

- "Magnetism." *Gale Elementary Online Collection*, Gale, a Cengage Company, 2020. *Gale In Context: Elementary*, https://link.gale.com/apps/doc/LSIFLX118668545/ITKE?u=icfe_news&sid=bookmark-ITKE&xid=89f8e612

Differentiating Instruction

Striving Learners

Explain

- Review content-specific vocabulary found in the text prior to reading.

Advanced Learners

Explain

- Ask students to write a summary of the information from the text.

Extension

- **Life Science**
 - Have students read the "[Magnificent Magnets](#)" article from *Gale In Context* and describe how magnetic forces impact animals.

Common Core Standards

Standard Source: *Common Core Standards Initiative* (2010)

CCSS.ELA-Literacy.RI.3.1

Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

CCSS.ELA-Literacy.RI.3.3

Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.

CCSS.ELA-Literacy.W.3.8

Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.

NGSS Standards

Standard Source: *Next Generation Science Standards* (2013)

3-PS2-3

Ask questions to determine cause-and-effect relationships of electric or magnetic interactions between two objects not in contact with each other.

3-PS2-4

Define a simple design problem that can be solved by applying scientific ideas about magnets.

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Source Citation (MLA 9th Edition)

"Magnetism." *Gale In Context: For Educators*, Gale, 2022. *Gale In Context: For Educators*,

https://link.gale.com/apps/doc/LSIFLX118668545/ITKE?u=icfe_news&sid=bookmark-ITKE&xid=89f8e612 Accessed 25 Jan. 2023.

Gale Document Number: GALE|FTCIJM988441657