COMMON CORE
Lessons & Activities

MAGNETISM

Reading for Information
Higher-Order Thinking
Writing Prompts
Current Events Analysis
Vocabulary
Cause & Effect
Graphic Organizers
& More!

REPRODUCIBLE

TEACH IT TODAY!
CORE™ RESOURCE

About this Book

This Common Core Lessons and Activities Book allows you to immediately meet new Common Core State Standards for English Language Arts, as well as Literacy and Writing in History/Social Studies. It is designed to supplement your Social Studies resources, adding new Common Core rigor, analysis, writing, inference, text-dependent questions, and more into your daily instruction.

How to Use this Book:

- Work through the lessons and activities as a class to teach your students higher-order thinking, analysis, and 21st century skills necessary to meet new Common Core expectations.
- Allow students to work through the lessons independently to build and practice these new skills.
- Include technology, collaboration, presentation, and discussion in the activities as you desire—you can decide how in-depth to go.
- Watch your class develop new abilities to meet the rigor of Common Core State Standards, right before your eyes!

Tips:

- Use some of the pages—or use them all—based on your grade, your students, your curriculum, and your needs.
- Use the pages at their current size, or if you prefer them to be 8-1/2" x 11", enlarge them 125% on your copy machine.
- Download graphic organizers labeled **"GO"** in the Table of Contents by going to: www.gallopade.com/client/go
- Use the correlations grid to easily see which Common Core standards are covered in each lesson.

Common Core Lessons & Activities:
Magnetism

By Carole Marsh
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G: Includes Graphic Organizer
GO: Graphic Organizer is also available 8½" x 11" online download at www.gallopade.com/client/go
(numbers above correspond to the graphic organizer numbers online)

The Power of Magnets

Read the texts and table and answer the questions.

Daryl conducted an experiment to investigate magnetic strength. He used four different magnets of different sizes and different metals. He tested for magnetic strength by measuring how many paper clips each magnet picked up—the more paper clips, the stronger the magnet.

Daryl summarized the results of his experiment in the table below.

Words to Know

alloy: a metal made by mixing two or more metals or a metal and another material

ferrous**: containing iron.

**Ferrous metals are the most common metals used to make magnets. However, some nonferrous metals including nickel and cobalt are also used to make magnets

Characteristics	Magnet A	Magnet B	Magnet C	Magnet D
Size	Small	Medium	Medium	Large
Made from	100% Iron	100% Nickel	50% Nickel 50% Cobalt	100% Iron
Number of paper clips picked up	10	14	17	24

1. Steel is a metal made of approximately 98% iron and 2% carbon.
   A. Is steel an alloy? Why or why not?
   B. Is steel ferrous? Why or why not?

2. Classify each of the magnets in the table as **ferrous** or **nonferrous**.
   A. _____ C. _____
   B. _____ D. _____

3. Were any of the magnets alloys? If so, which one(s)?

4. A. What is the purpose of the paper clips in the experiment?
   B. Which row of the table represents the strength of each magnet?
   C. Which magnet is strongest? How do you know?

5. According to Daryl's experiment, how does a magnet's size affect its strength?

6. According to Daryl's experiment, which is stronger—a pure nickel magnet or a magnetic alloy made of nickel and cobalt? Explain.

How Does It Work?

Read the texts and answer the questions.

Why are some objects magnetized while others are not? Weber's Theory and Domain Theory are two popular theories that have been developed to explain why. Weber's Theory is based on the molecular alignment of material in a magnet. Domain Theory is a more modern explanation that is based on the motion of the electrons in the magnetic material.

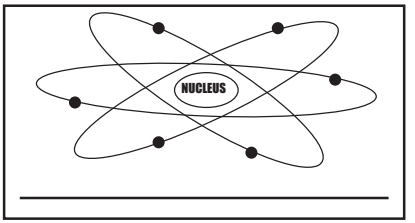
Weber's Theory says that all magnetic substances contain tiny molecules called dipoles, and each dipole has a positive end and a negative end (like the poles of the magnet). Non-magnetized metals have messy dipoles that are arranged in a random order. Magnetized metals have their dipoles lined up where the positive ends all face the same direction, and the negative ends all face the opposite direction. The alignment of the dipoles gives an object its magnetic properties.

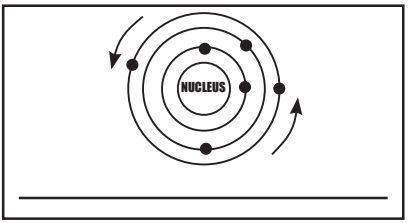
The Domain Theory says that magnetism is caused by the motion of electrons. Electrons are the part of an atom that circles around the nucleus. In non-magnetized metals, the electrons circle around the nucleus in different directions, half of the electrons moving one direction, and half moving the other direction. However, in the atoms of magnetized metals, more of the electrons revolve around the nucleus in one direction than in the other direction. It is this alignment of more than half of the electrons that gives an object its magnetic properties.

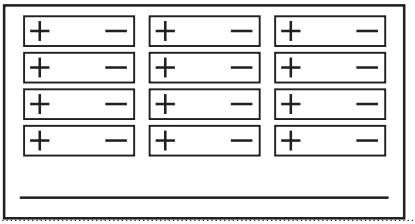
PART A: Answer these questions based on the first text.

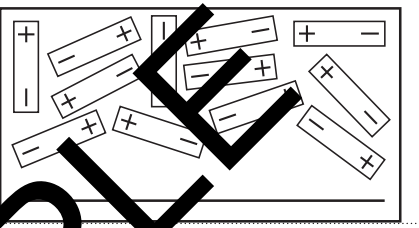
1. What is the purpose of the two theories described in the text?
2. A. Use the text to define dipoles.
   B. What do dipoles have in common with magnets?
3. A. Which theory is primarily based on alignment of dipoles?
   B. Which theory is primarily based on motion of electrons?
4. Summarize each of the theories in your own words.

5. Match each of the following descriptions to the correct diagram.
   A. non-magnetized dipoles
   B. magnetized dipoles
   C. non-magnetized atom
   D. magnetized atom









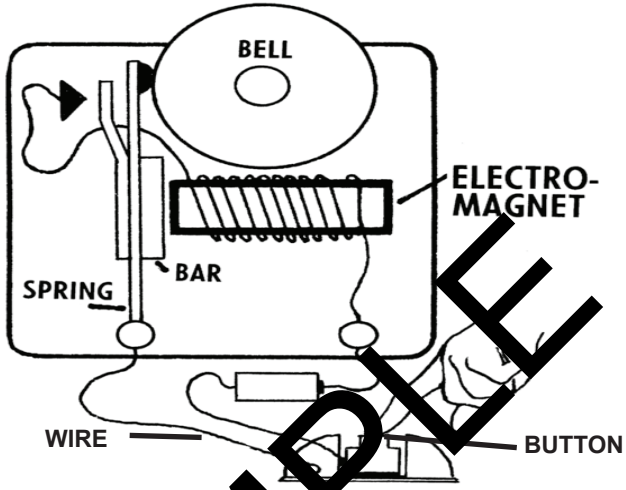
PART B: Use what you have learned to analyze the text and answer these questions.

Some magnets are naturally occurring in the Earth, but most magnets are created. To turn a non-magnetized steel bar into a magnet, rub a magnet against the steel bar several times, each time rubbing in the same direction. The non-magnetized steel bar will become magnetized!

6. A. Use Weber's Theory to describe what happens when you turn a steel bar into a magnet.
   B. Draw a diagram to illustrate the change that occurs.
7. A. Use the Domain Theory to describe what is happening.
   B. Draw a diagram to illustrate the change that occurs.
8. If the steel bar that was magnetized eventually loses its magnetism, describe what must have occurred according to:
   A. Weber's Theory
   B. Domain Theory
9. Do you think rubbing a magnet across a steel bar in random directions would cause the steel bar to become magnetized? Why or why not?
10. Do you think rubbing a magnet across a metal paperclip would cause the paperclip to become magnetized? Why or why not?

Magnetic Mechanism

Look at the diagram and answer the questions.



1. What is the purpose of each of the following parts of the machine?
   A. The wire
   B. The electromagnet
   C. The spring
   D. The bell
2. List at least 5 devices in which a machine like this might be used.
3. Number the events below in the proper sequence:

   _____ The electric current runs through the solenoid coils.

   _____ The metal bar is held away from the bell by a spring.

   _____ The button is pressed, allowing electricity to flow through the wire.

   _____ When the button is released, the electric current turns off.

   _____ The electromagnet becomes magnetized.

   _____ The electromagnetic demagnetizes and the bar returns to its resting position.

   _____ The metal bar is pulled towards the electromagnet, causing the bar to strike the bell.

Can You Pick It Up?

PART A: With a partner, collect all of the objects listed in the chart. Sort the objects into groups. You might group objects based on size, weight, shape, material, or some other criteria you choose.

PART B: As a class, discuss the different characteristics that were used to sort the objects, and how easy or difficult it was to determine which items went into which groups. List three methods that were used, and describe how precise or imprecise those classification methods were.

PART C: Predict which items will be attracted to a magnet (magnetic) and which items will not be (non-magnetic), and record this in the chart.

PART D: Slowly touch each item with a bar magnet. Record your observations in the chart, and then answer the questions that follow.

Item	Prediction	Observed Effect of Magnet
paper clip		
toothpick		
notebook paper		
dime		
penny		
plastic cup		
scissors		
pen		
pencil		
staples		

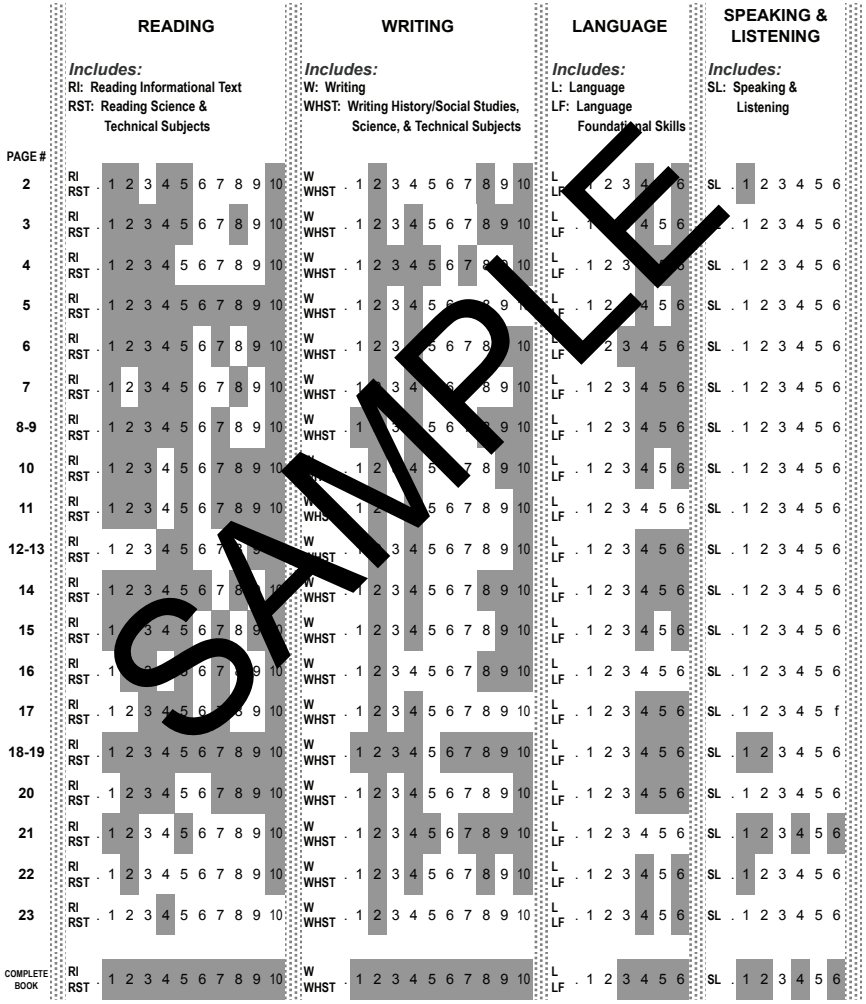
1. A. Which items are magnetic? What did they have in common?
   B. Which items are non-magnetic? What did they have in common?
   C. Did any items seem more magnetic than others? Describe.
2. Based on your observations, which characteristics were common in the items that were magnetic? (size, shape, weight, material, etc.)
3. Write a hypothesis for a new experiment based on your analysis.

Correlations to Common Core State Standards

For your convenience, correlations are listed page-by-page, and for the entire book!

This book is correlated to the Common Core State Standards for English Language Arts grades 3-8, and to Common Core State Standards for Literacy in History, Science, & Technological Subjects grades 6-8.

Correlations are highlighted in gray.



For the complete Common Core standard identifier, combine your grade + "." + letter code above + "." + number code above.

In addition to the correlations indicated here, the activities may be adapted or expanded to align to additional standards and to meet the diverse needs of your unique students!

Common Core Lessons & Activities Books

Social Studies Titles:

- Declaration of Independence
- U.S. Constitution
- Bill of Rights
- Road to the Civil War
- The Civil War: Key Battles & Events
- Jamestown
- Key Events of World War II
- Civil Rights Movement
- Branches of Government
- Basic Economic Concepts
- Women's Suffrage and the 19th Amendment
- The American Revolution
- Explorers
- The Olympics
- Underground Railroad
- Forms of Government: Democracy, Monarchy, & Oligarchy & More
- Ancient Greece
- Ancient Egypt
- Native Americans
- Indian Removal & the Trail of Tears
- Inventors & Inventions
- Map Skills
- Westward Expansion
- Communities

Science Titles:

- Habitats
- States of Matter
- Cell Structure
- Weather
- Water Cycle
- Energy
- Solar System
- Sound
- Mammals
- Light
- Rocks and Minerals
- Oceans
- Heredity & Genetics
- Magnetism
- Natural Resources
- Ecosystems
- Force & Motion
- History of the Earth
- Life Cycles
- Wave Properties
- Landforms
- Classification of Organisms
- Electricity
- The Scientific Method

COMMON CORE Lessons & Activities

Are you expected to change how you teach because of new CCSS for English Language Arts & new CCSS for Literacy and Writing in History/ Social Studies and Science?

Are you expected to continue to meet existing science and social studies standards, AND integrate new, more rigorous expectations for reading, writing, analysis, inference, and more into your daily instruction?

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