

Lesson Outline**LESSON 3****Magnetism****A. What is a magnet?**

1. Any object that attracts iron is a(n) _____.
2. Iron is an example of a(n) _____ because a magnet attracts iron.

B. Magnetic Fields and Magnetic Forces

1. A magnet is surrounded by an invisible _____.
2. A push or pull that a magnet applies on a magnetic material is a(n) _____.
 - a. This force exists even if the objects are not _____.
 - b. Magnetic field lines start on the _____ pole of a magnet and end at the _____ pole.
3. Magnetic poles apply _____.
 - a. Two poles of the same type _____ each other.
 - b. A north pole and a south pole _____ each other.
4. Molten iron and nickel in Earth's _____ cause Earth to act like a giant magnet.
 - a. Earth has a magnetic north pole and a magnetic _____.
 - b. Earth's magnetic south pole is near Earth's geographic _____ Pole.

C. Magnets

1. Atoms are grouped in _____ in some materials.
 - a. A magnetic domain is a region in a magnetic material in which the _____ of the atoms all point in the same direction.
 - b. The individual magnetic fields combine to form _____ magnetic field.
2. In nonmagnetic materials, the random magnetic fields cancel out the magnetic _____ of each other.
3. Some magnetic materials, such as iron and _____ are grouped in _____.
 - a. Not all magnetic materials are _____.

Lesson Outline continued

b. If the magnetic domains point in the same direction, the material becomes a(n) _____.

4. Magnetic materials are known as either soft magnetic materials or _____.

a. Soft magnetic materials form _____ magnets.

b. Hard magnetic materials form _____ magnets.

D. Combining Electricity and Magnetism

1. The relationship between electricity and magnetism is called _____.

2. Electric current is produced when a(n) _____ and a wire _____ move past each other.

3. An electromagnet is a type of temporary magnet produced when a current-carrying wire is wrapped around a(n) _____ core.

4. The magnetic field of an electromagnet can be turned on and off by turning the _____ on and off.

5. The strength of an electromagnet can be controlled by controlling the amount of _____ in the coil, or by the number of _____ in the coil.

Content Practice B

LESSON 3

Magnetism

Directions: Explain the relationship that exists between each set of terms on the lines provided.

1. magnet, magnetic material

2. magnetic force, magnetic poles

3. magnetic field, magnetic domain

4. nonmagnetic material, magnet

5. soft magnetic material, hard magnetic material

6. temporary magnet, permanent magnet

7. generator, electromagnet

School to Home

LESSON 3

Magnetism

Directions: Use your textbook to respond to each statement.

- 1. Many common objects use magnets.**

Define *magnet* and list three metals that are attracted to magnets.

- 2. Magnets vary in shape and size, but all magnets have two magnetic poles.**

Explain how the force between a magnet's pole and an object is related to the distance between them.

- 3. Earth is a magnet. Its magnetic field is generated by currents of molten nickel and iron near its core.**

Apply this information to explain how a compass works.

- 4. Some objects are magnets. Others are made up of magnetic materials; still others are made up of nonmagnetic materials.**

Describe the arrangement of atoms in magnets, magnetic materials, and nonmagnetic materials.

Key Concept Builder 

LESSON 3

Magnetism

Key Concept What causes a magnetic force?

Directions: Answer each question on the lines provided.

1. What is a magnetic force?

2. How does distance affect the strength of the magnetic force?

3. What is a magnetic pole?

4. What are the two types of magnetic poles?

5. How do magnetic poles interact?

Directions: Draw arrows between each set of bar magnets to show whether the magnets will attract one another ($\rightarrow\leftarrow$) or repel one another ($\leftarrow\rightarrow$). S represents the south pole, and N represents the north pole.



Key Concept Builder 

LESSON 3

Magnetism

Key Concept How are magnets and magnetic domains related?

Directions: Use the diagram to answer each question on the lines provided.

Figure A

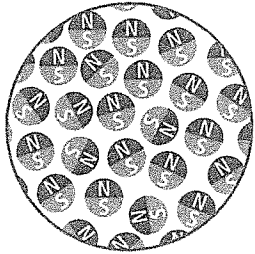


Figure B

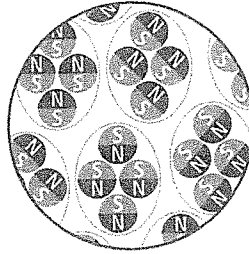
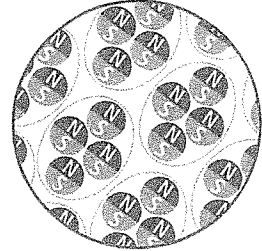


Figure C



1. What do the smallest circles represent in each of the three diagrams?

2. Which figure shows a nonmagnetic material? Use the concept of magnetic domains to explain how you reached your answer.

3. Which figure shows a magnetic material? Use the concept of magnetic domains to explain how you reached your answer.

4. Which figure shows a magnet? Use the concept of magnetic domains to explain how you reached your answer.

