



Lesson Plan: Magnetism

Grade Level: 6

Subject: Physical Science

Duration: 45–60

NGSS MS-PS1-1: Develop models to describe the atomic composition of simple molecules and extended structures.

Learning Objectives

By the end of this lesson, students will be able to:

- **Explain** what magnetism is and identify the fundamental force that causes it.
- **Identify** ferromagnetic materials and distinguish them from non-magnetic materials.
- **Describe** magnetic fields and how they exert force on other objects.



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produced when an electric current flows through a coil of wire.

- **Compass:** A device used to detect the Earth's magnetic north pole. It has a small needle that responds to the Earth's magnetic field by always pointing north.
- **Domain:** Clusters of atoms inside a magnet that are responsible for magnetic properties. In a domain, the atoms line up with similar magnetic fields.
- **Electromagnetic induction:** The process of creating an electric current by changing a magnetic field, such as when a magnet moves through a coil of wire.



Materials Needed: (all links are included in this PDF)

- Printed copies of the Study Guide (<https://newpathworksheets.com/api/guide/study-guide-science-grade-6-magnetism-1.pdf>)
- Activity Lesson handout (<https://newpathworksheets.com/api/activity-lesson/activity-lesson-science-grade-6-magnetism-1-4.pdf>)
- Vocabulary matching worksheet (<https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-6-magnetism-1-1.pdf>)
- Assessment worksheet (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-6-magnetism-1-0.pdf>)
- Bar magnets (at least two per group)
- Iron filings or small paper clips
- Compass
- Battery, wire, and iron nail for electromagnet demonstration



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iron filings on top to show the field lines.

- Explain magnetic poles and the law of magnetic poles: like poles repel, unlike poles attract. Use two bar magnets to show attraction and repulsion.
- Introduce electromagnetism by wrapping wire around an iron nail, connecting it to a battery, and showing how the nail becomes magnetized and can pick up paper clips.

Step 3: Guided Practice (15 minutes)

- Distribute the Activity Lesson handout and work through the diagrams of magnetic fields and poles as a class. (<https://newpathworksheets.com/api/activity-lesson/activity-lesson-science-grade-6-magnetism-1-4.pdf>)



- Complete the vocabulary matching worksheet together, reinforcing key terms such as magnetic field, magnetic pole, compass, domain, magnet, and magnetism.
(<https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-6-magnetism-1-1.pdf>)
- Discuss the Earth's magnetic field and how a compass works by always pointing toward the magnetic north pole.

Step 4: Independent Practice (15 minutes)

- Provide students with bar magnets and have them explore attraction and repulsion by bringing the poles of two magnets together.
- Have students use a compass to observe how it responds to the bar magnet's magnetic field at different distances and orientations.
- Instruct students to complete one of the practice worksheets independently, applying their understanding of magnetic fields, poles, and electromagnetism.

(<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-6-magnetism-1-1.pdf>)



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- Challenge advanced learners to research and present on practical applications of electromagnetism, such as electric motors, generators, or MRI machines.
- Have students design and build their own simple electromagnet using a battery, wire, and nail, then test its strength by counting how many paper clips it can pick up.

For learners needing support:

- Provide pre-labeled diagrams of magnetic fields and poles for students who need visual support during the lesson.
- Offer one-on-one assistance during hands-on activities with magnets and compasses, and provide sentence starters for vocabulary definitions.



Extension Activities

- Research Project: Assign students to investigate the Earth's magnetic field, including how it protects us from solar radiation and how animals like birds use it for navigation.
- Hands-on Experiment: Have students build a simple electric motor using a battery, wire coil, and magnet to observe electromagnetism in action.
- Creative Writing: Ask students to write a short story from the perspective of a compass needle navigating through different magnetic fields.

Complete List of Available Resources:

- NewPathWorksheets: Magnetism Topic Page
(<https://newpathworksheets.com/science/grade-6/magnetism-1/>)



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MAGNETISM

Magnetic Poles

A **magnet** is any substance that attracts the element iron or anything with iron in it. All magnets have opposite ends or **poles**. These are referred to as the **north** and **south** poles. Because similar poles repel each other and opposite poles attract each other, magnets can either repel or attract each other. The degree to which they do this depends on the **magnetic force** of the magnet. In addition, because of **polarity**, all magnets will point toward the magnetic north pole of the earth.

While the greatest **magnetic force** is at the poles, there is some degree of magnetism all around a magnet. This is called the **magnetic field**.



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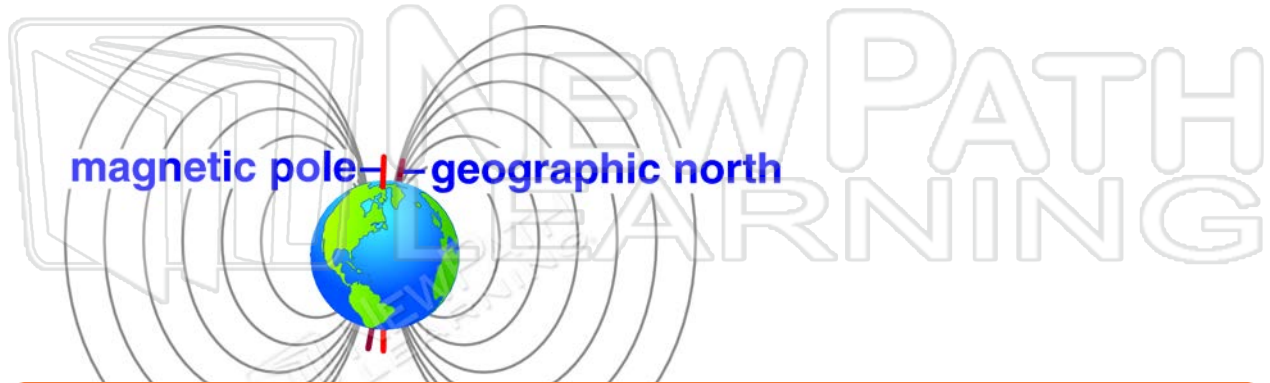
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In a domain, the atoms line up with similar magnetic fields. Substances in which all or most of the domains are lined up in the same direction are said to be **magnetized**. Substances in which these domains line up in different directions are considered to be non magnetic.

LESSON CHECKPOINT:
What are magnetic domains?

Earth's Magnetism

The earth acts like a giant magnet. While the magnetism of the earth is difficult to explain, there is no question that it has two opposite poles and a strong magnetic field. While the earth has a geographic north and south pole, it also has a magnetic north and south pole.



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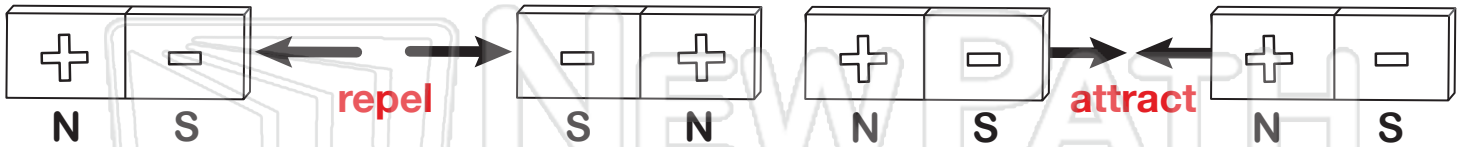
LESSON CHECKPOINT:
How is the Earth like a magnet?



Magnetism

Name _____ Class _____ Date _____

A **magnet** is any substance that attracts the element **iron** or anything with iron in it. All magnets have opposite ends or **poles**. Because similar poles **repel** each other and opposite poles **attract** each other, **magnets** can either **repel or attract** each other.



Magnetic Fields

While the greatest **magnetic force** is at the **poles**, there is some degree of **magnetism** all around a magnet. This is called the **magnetic field**. It is the space around a magnet where magnetic materials are affected by forces. and so m

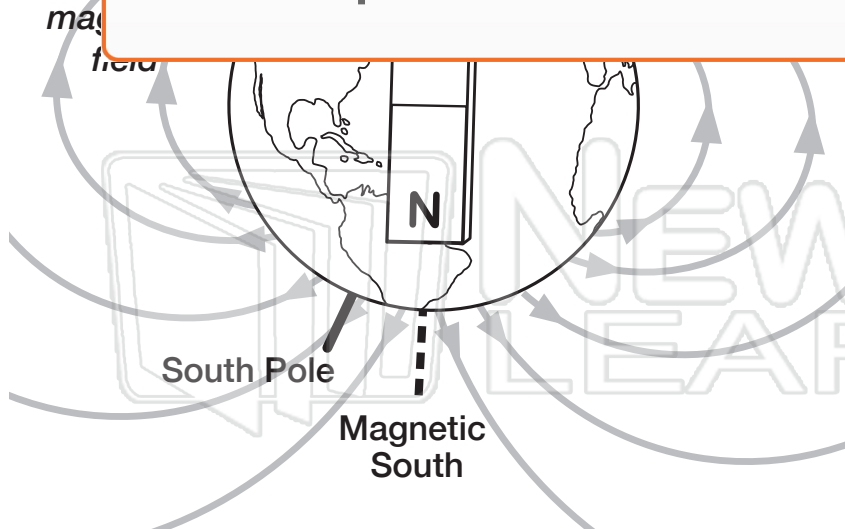
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nic
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and



a **south pole**.

A **compass** will point north because it is attracted to the opposite pole of the imaginary magnet inside the Earth. The Earth's magnetic North Pole is *actually* a magnetic South Pole of the magnetic substance of the Earth's core.



Electromagnetism

A magnetic field is produced when an **electric current** flows through a coil of wire. This relationship between electricity and magnetism is called **electromagnetism**. The magnetic field around an **electromagnet** is similar to the one around a bar magnet. Unlike bar magnets which are **permanent magnets**, the magnetism of electromagnets can be controlled by switching on or off the electric current.

The diagram illustrates an electromagnet setup. It features a rectangular battery with a '+' sign on its top surface. Two wires connect the battery to a coil of wire. One wire is labeled 'current from battery'. The coil is wrapped around a cylindrical core, which is labeled 'iron' at its right end. The entire setup is shown in a simple line-drawing style.



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Electromagnetism

Name _____ Class _____ Date _____

Fill in the blanks.

Magnetic Fields

While the greatest _____ is at the _____, there is some degree of _____ all around a magnet. This is called the _____. It is the space around a magnet where magnetic materials are affected by forces, and so may be attracted or repelled.

_____ lines are invisible lines that map the strength of the magnetic force

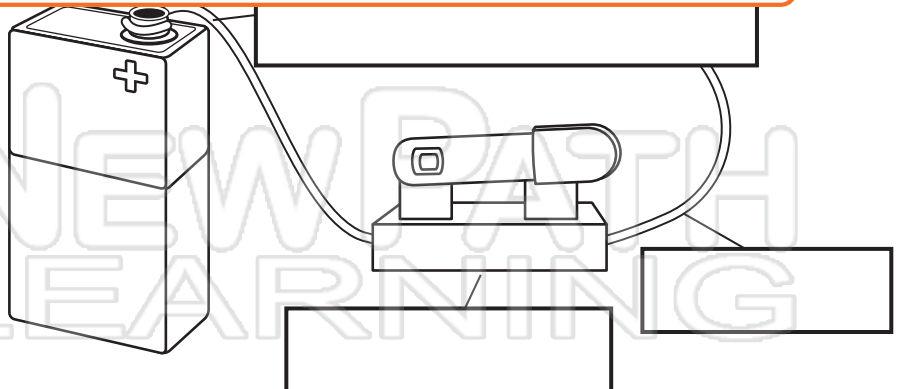
around
lines of
force

What



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Electromagnetism

Answer Key - Sample

Fill in the blanks.

Magnetic Fields

While the greatest magnetic force is at the poles, there is some degree of magnetism all around a magnet. This is called the magnetic field. It is the space around a magnet where magnetic materials are affected by forces, and so may be attracted or repelled.

Magnetic field lines are invisible lines that map the strength of the magnetic force

around
lines of
force

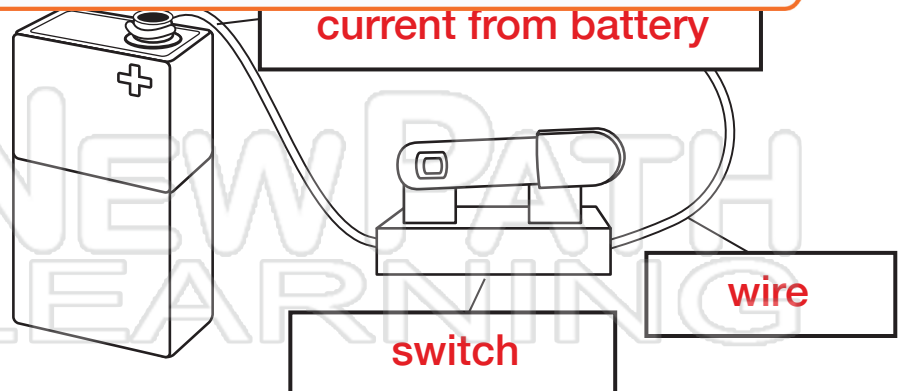
What
It's a
a ma

running an electric current
through a coiled wire. They
are used in electric motors,
computers and power
generators, among other
devices.



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Name _____ Class _____ Date _____

1

A **paper clip** can be made into a **temporary magnet**. What is the reason for this?

- A it is difficult to magnetize, but holds its magnetism
- B it is easy to magnetize, but easily loses its magnetism
- C it is easy to magnetize, and it holds its magnetism
- D it is difficult to magnetize, and it easily loses its magnetism



2

A **permanent magnet** is one that is **difficult** to magnetize, and _____.

- A holds its magnetism for a long time
- B holds its magnetism for a short time
- C holds its magnetism forever
- D can never break



3

In the diagram below, predict at which points the **magnetic force** would be the **greatest**.

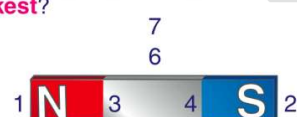
- A 5 and 6
- B 1 and 4
- C 1 and 2



4

In the diagram below, at which points would the **magnetic field** be the **weakest**?

- A 1 and 2
- B 3 and 4
- C 4 and 5



5



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7

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9

The **magnetic** North Pole changes location, but the **geographic** North Pole does **not**. True or false?

- A true
- B false



10

The diagram below shows the **movement of particles** inside a substance. The particles look like _____.

- A they have been magnetized
- B they have not been magnetized
- C they are moving in one direction
- D they have been crushed





Name _____ Class _____ Date _____

1

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- A it is difficult to magnetize, but holds its magnetism
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- C it is easy to magnetize, and it holds its magnetism
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(B)

2

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- C holds its magnetism forever
- D can never break



(A)

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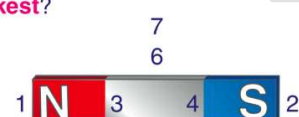


(C)

4

In the diagram below, at which points would the **magnetic field** be the **weakest**?

- A 1 and 2
- B 3 and 4
- C 4 and 5



(D)

5



(B)

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7

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(D)

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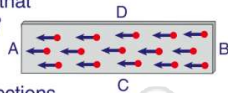
(B)



Name _____ Class _____ Date _____

1

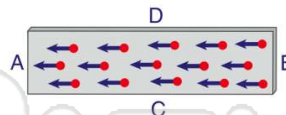
The diagram below shows the **particles** inside a piece of **magnetized iron**. What evidence is there in the diagram that the iron is magnetized?



- A all the particles point in different directions
- B all the particles point in the same direction
- C most of the particles point in opposite directions
- D only a few particles point in the same direction

2

In the diagram below of a piece of magnetized iron, the **poles** are located at points _____.



- A A and D
- B A and B
- C A and C
- D C and D

3

Which material would make the **strongest magnet**?

- A aluminum
- B tin
- C iron
- D copper



4

All magnets _____.

- A have the same force
- B are made of iron
- C have two poles
- D cannot lose their magnetic properties



5



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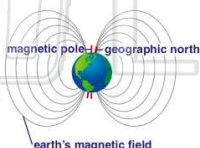
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9

Based on the diagram below, it is correct to say that a **compass** would _____.

- A always point to the geographic North Pole
- B likely point close to the geographic North Pole
- C point to the magnetic South Pole
- D point half way between the magnetic and geographic poles



10

A reliable **compass** would have a needle **made of** _____.

- A plastic
- B paper
- C cardboard
- D metal

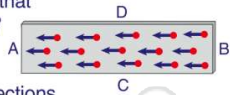




Name _____ Class _____ Date _____

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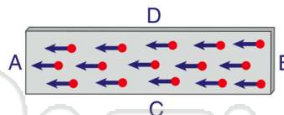


- A all the particles point in different directions
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(B)

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- A A and D
- B A and B
- C A and C
- D C and D

(B)

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(C)

4

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(C)

5



(A)

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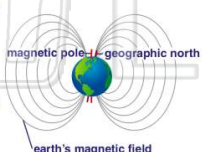
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(B)

9

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(B)

10

A reliable **compass** would have a needle **made of** _____.

- A plastic
- B paper
- C cardboard
- D metal



(D)



Name _____ Class _____ Date _____

Match each of the following terms to its definition:

Magnetic field

Magnetic pole

Compass

Domain

Magnet

Magnetism

1. something that attracts certain kinds of metals
such as iron



2. the area around the magnet with magnetic
force; the invisible field around a magnet



3. north
magnet



4. **PREVIEW**
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5. one of two ends of a magnet with strong
magnetic force



6. the ability for a substance to attract iron or
substances mixed with iron





Name _____ Class _____ Date _____

Match each of the following terms to its definition:

Magnetic field

Magnetic pole

Compass

Domain

Magnet

Magnetism

1. magnet - something that attracts certain kinds of metals such as iron



2. magnetic field - the area around the magnet with magnetic force; the invisible field around a magnet



3. con
a tool
field b



4. dor

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5. magnetic pole - one of two ends of a magnet with strong magnetic force



6. magnetism - the ability for a substance to attract iron or substances mixed with iron

