Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Hour \_\_\_\_\_\_\_\_\_\_\_\_\_\_

  **Magnetism Station 3: Mapping Magnetic Field Lines**

**Content Objective:** Students will explore magnetism and learn about their different poles, invisible magnetic fields, attraction and repulsion.

**Writing Language Objective:** Students will detect and draw a magnetic field using a compass.

**Essential Question: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Materials (pairs)**

-1 magnetic compass -2 Alnico bar magnets -6 sheets of white paper

-4-5 paper clips -iron fillings

**Do not bring magnets near computers!!**

**Part 1-Pre-lab questions: Answer these questions using complete sentences with a restate. You may discuss these questions with your table groups**

1. What do you know about magnetism?

2. Is the Earth magnetic?

3. Is the Sun or other planets in our solar system magnetic?

4. How does a compass work?

**Part 2:** Raise your hand and ask Ms. Murphy in a British accent for the Mapping Magnetic Fields Materials. Explore your materials and answer the following questions using complete sentences with a restate.

|  |  |  |
| --- | --- | --- |
| 1. | http://cse.ssl.berkeley.edu/SegwayEd/lessons/exploring_magnetism/Exploring_Magnetism/Exploring_Magnetism_images/spacer_white_13x13.jpg | What do you notice about the interaction of the bar magnets you were given?     |
| http://cse.ssl.berkeley.edu/SegwayEd/lessons/exploring_magnetism/Exploring_Magnetism/Exploring_Magnetism_images/spacer_white_13x13.jpg |
| 2. | http://cse.ssl.berkeley.edu/SegwayEd/lessons/exploring_magnetism/Exploring_Magnetism/Exploring_Magnetism_images/spacer_white_13x13.jpg | What materials interact with the magnets and how do they interact?**Interacts with magnets:**  **Does not interact with magnets:**  What do all the materials that interact with the magnets have in common?   |
| http://cse.ssl.berkeley.edu/SegwayEd/lessons/exploring_magnetism/Exploring_Magnetism/Exploring_Magnetism_images/spacer_white_13x13.jpg |
| 3. | http://cse.ssl.berkeley.edu/SegwayEd/lessons/exploring_magnetism/Exploring_Magnetism/Exploring_Magnetism_images/spacer_white_13x13.jpg | What happens when you bring a compass near a magnet? How does it depend on where you place the compass? (Use the back of this sheet if you need more space)  |

4. Arrange your compasses around on of the bar magnets as shown below.



5. The compass needle is a tiny \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ suspended on a pivot. So it will turn with minimal \_\_\_\_\_\_\_\_\_\_\_ if a magnetic force is applied to it.

**Part 3**

6. Tape the two pieces of white paper together and place the bar magnets on top and in the middle of the tapped paper. You will trace the magnetic field shape around the bar magnet. Color in the North pole blue and the south pole red.

A. Draw a dot somewhere near the magnet and place the center of the compass over the dot (in a color other than blue or red)

B. Draw a dot at the location of the compass needle head (tail) of the compass needle.

C. Move the compass center to this new dot, and again drawsa dot at the location of the compass needle head (tail).

D. Remove the compass from the paper and draw lines connecting the dots with arrows indicating the direction the compass points.

E. Continue stops B-D until the line meets the magnet or the edge of the paper.

F. Pick another spot near the magnet and repeat the process (Step A-E)

G. Be sure to attach your drawing to your assignment before turning in.

|  |
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|  |

**Part 4: Collect two bar magnets and iron fillings.**

1. Place the iron fillings bag above the magnet and shake it gently spreading the fillings out. Record your observations below.

|  |  |
| --- | --- |
| S |  N |

2. Place two bar magnets next to each other as shown below. Place the bag of iron fillings above the magnet and draw what you observe below.

|  |  |
| --- | --- |
| N | S |
| S | N |

3. Place your magnets as shown below. Gently shake the iron filling bag and place it above the magnets. Draw what you observe.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| S |  N | Space between bars | N |  S |