

Interactive Notes-“Magnetism”

Materials (per group of 4 students):

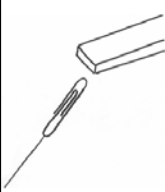
Demo 1	1-small paper clip with 20cm of fishing line or very fine thread tied to it 1-ring stand and utility clamp 1-bar magnet
Demo 2	1-compass 1-small strip of newspaper (~ 1cm x 8cm) 1-small strip of aluminum foil (~ 1cm x 8cm) 1-small piece of steel wool
Demo 3	1-hanging magnet holder (see demo 3 for instructions)
Demo 4	1-blank sheet of copy paper 1-sandwich bag with about 2 grams of iron filings (item #WW94154M06 at sciencekit.com), with a small hole in a bottom corner
...and	4-note sheets

Additionally- PowerPoint

Beforehand:

- Tie strings to paper clips (see demo #1) and make the bar magnet hanging holders (demo #3).
- Hang the bar magnet holders from the ceiling around the room, one near where each group will be.
- Fasten the bar magnet in the jaws of the utility clamp. Set it to about 8 inches off the table surface.
- Set out all materials *the day before*. Leave yourself time to realize you're missing something, to practice the new demonstrations, research something, or even make a change. In the morning, read through the slides and notes one last time. Relax and have fun along with your students. Remember- you're only as effective as your plan.
- Charge up your bar magnets with a magnetizer. If you don't have a Hi-Strength Magnetizer (item [#WW69601M05 at sciencekit.com](#)), consider investing in one. This recharges bar magnets and horse-shoe magnets in about 1 second back to full strength.
- Keep an extra set of materials for yourself up front so you can show to students how to do the demos. Even the best worded explanation sometimes isn't enough.
- Have an earth globe set out too. You'll refer to it a couple of times throughout the notes.
- Insert page and paragraph numbers from relevant pages in your textbook at the bottom of slides 1 and 2 if you choose to have the class read from it together. This is a good way to connect with your textbook as well as transition into the next demo. You can also delete these page inserts, ignore them, or Copy and Paste them onto later slides if needed.
- As with any other demonstration, try these out ahead of time for yourself so you know how they work best and so you know what to expect.
- Print extra copies of the notes pages on paper for yourself, students that are slow writers or can't see well, and for absentees. Click "File" → "Print" → then where it says "Print what:" select "Handouts" → and then "OK".
- For a follow-up activity, check out the "Encrypted Magnetism Statements" activity.

Interactive Notes: Magnetism



Do: Dangled a paper clip near a magnet.

See: The magnet attracted the paper clip.

What's Happening: **Magnetism** is the force of attraction and repulsion between two objects or materials.

Read p. 11 together

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1.

Tell student #1 (of the 4) to dangle the paper clip on the end of a string near the magnet, and observe how it behaves. Now it's time to do the impossible- as the picture shows, hold the paper clip below, but still close enough to the magnet that it stays when you let go. Make sure the paper clip and magnet are not touching and that a gap between them can be clearly seen.

Tie a 20cm piece of fishing line or fine thread, which weighs very little, to each paper clip. Use small steel paper clips. Don't use jumbo paper clips or those that are painted- they are too heavy and won't "fly".

Fasten the bar magnet to the utility clamp on the ring stand so it stays perfectly still.

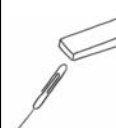
Referring to the phrase "force of attraction and repulsion" in the notes, magnets obviously attract things with iron in them, like paper clips. But ask- "What do they repel?" (*answer- the opposite poles on other magnets*)

(end of Teacher Notes preview)

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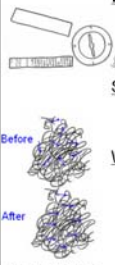
Read p. 1 together

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Do: Dragged a magnet 30 times over newspaper, aluminum, & steel wool. Checked with compass.

See: The compass did not respond to newspaper or aluminum. It did to iron.

What's Happening: Some things can be **magnetized**, some cannot. Each iron atom in the wool has its own north and south pole, called the **domain**. The more these domains line up the same way, the stronger the current.



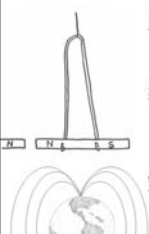
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Do: Placed a bar magnet in the holder.

See: It lined up with earth's magnetic poles. It also attracted and repelled other magnets.

What's Happening: Like poles (n/n, s/s) repel, and opposites (n/s, s/n) attract. Earth is a giant (but weak) magnet, mostly as a result of the churning magma in the interior.




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Do: Covered a bar magnet with a sheet of paper and sprinkled on iron filings.


See: The filings formed a pattern of loops, leaving one part of the magnet and entering another.

What's Happening: Bar magnets have **lines of force** looping out and back in. These make up it's invisible **magnetic field**. The **poles** are strongest and the middle is weakest.



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Clean Up



Person 1

- Put paper clip in box
- Put magnet in box (leave other one clamped)

Person 2

- Throw steel wool away; get another piece
- Put pieces of newspaper & foil in box

Person 3

- Count 4 new note sheets

Person 4

- Slide iron filings back into baggie

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◆ Student Handout

Topic: _____ Date: ___/___/___

Do: _____

See: _____














What's happening:

Do: _____

See: _____

What's happening:

◆ Drawings & Pictures

 Drawing-Attracting Paper Clip	 Drawing-Charged And Uncharged	 Drawing-Hanging Magnet	 Drawing-Magnet With Filings
 Drawing-Wool Only	 Holder-Winding Up And Putting Away	 Pic-Attracting Paper Clip	 Pic-Charged And Uncharged
 Pic-Globe	 Pic-Hanging Magnet	 Pic-Magnet With Filings	 Pic-Other Magnet
 Student Pic-Materials			

◆ Bonus Activity-Decode the Statements

Magnetism- Encrypted Key Statements

2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100