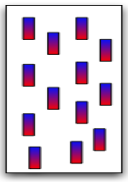
Magnetism

Magnet Mania!.avi

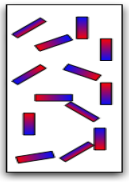
In order for a substance to be considered magnetic it must have 2 criteria:

1- It must have domains (north and south poles).

2- The domains must be aligned.



Magnet: Alignment of Magnetic Domains



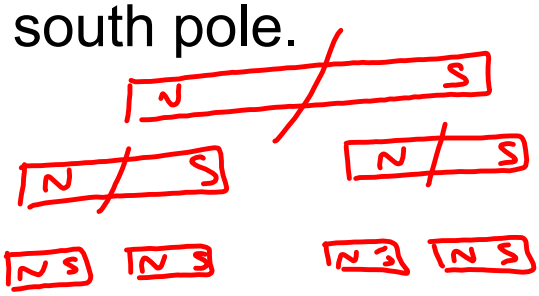
Non-Magnet: Random Arrangement of Magnetic Domains

Magnet rules

1. Will have a north and south pole.

2. Opposite poles attract, the same poles repel.

3. If a magnet is cut in half, it will still have a north and south pole.

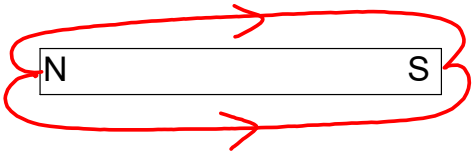


4. The larger the distance between 2 poles, the weaker the attraction or repulsion will be.

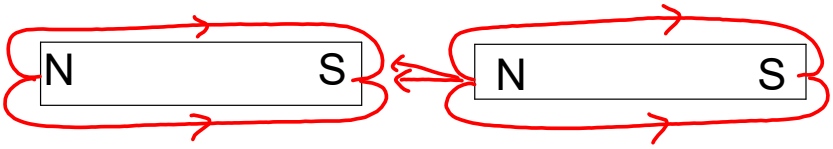
Magnetic fields

- A magnetic field is the area around which the effects of a magnet are felt by another magnet.
- A magnetic field always travels from a **N to S** pole and can travel in all directions as long as there is attraction or repulsion.

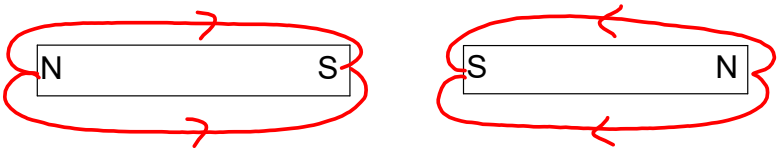
Example 1



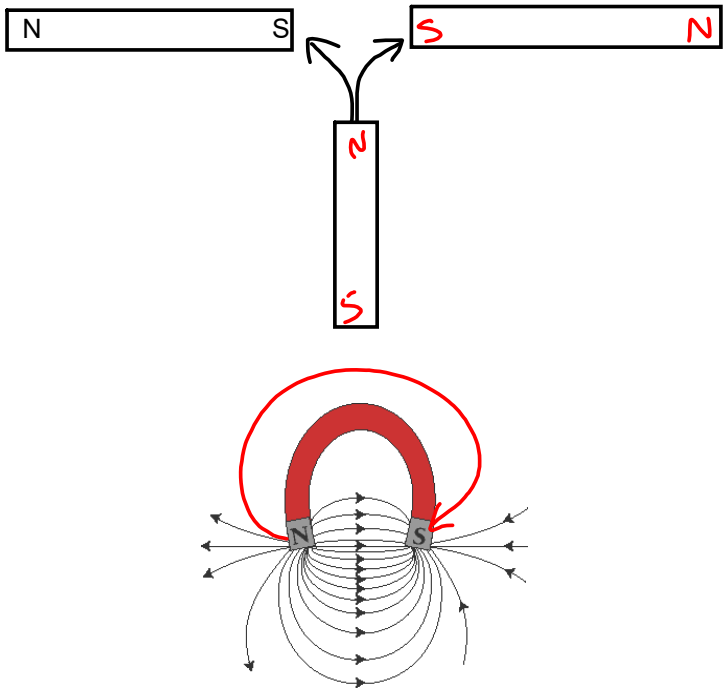
Example 2



Example 3



Example 4

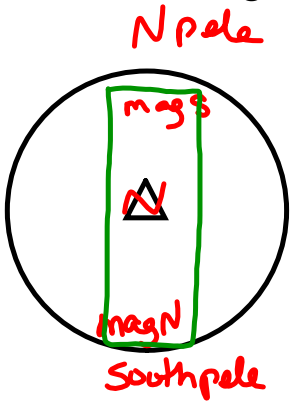


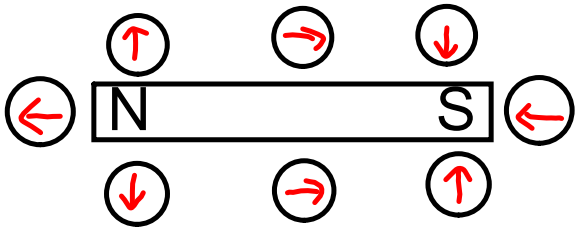
Earth's magnetic field

- Inside the earth's surface there is a huge amount of ferromagnetic liquids (Fe, Co, Ni). These liquids are constantly in motion and produce a massive magnetic field which can be felt anywhere around the world.

How a compass works

- A compass has a magnetic north setting which works like a magnet. A compass points you to geographic north because this is where magnetic south is.
- It points away from geographic south because this is where magnetic north is.





News! A total reversal of Earth's Magnetic Fields is coming!.avi

Bermuda Triangle_ what happened to Flight 19_ - BBC.avi

Bermuda Triangle Coral Castle Mystery Part 5 Conclusion.avi

Crystal Pyramid in the Bermuda Triangle.avi

Magnetic Field of a Live Wire

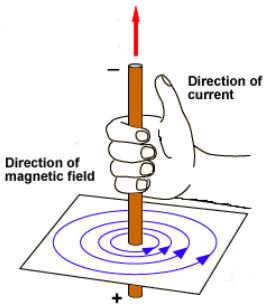
- When current is passing through a wire, a magnetic field is created which cannot be seen or feel the magnetic field, but a compass will react to it.

The right hand rule

- Gives us current direction and magnetic field direction.

Thumb: points to current direction (-) (+ to -)

Fingers: Curls in the magnetic field direction (N to S)



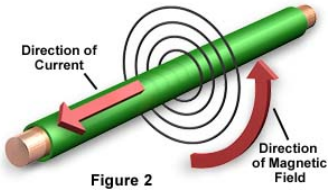


Figure 2

- Your fingertips are like the N part of the compass, they are pointing you towards south.

The Right Hand Rule and the Magnetic Field Straight Wire.mp4
Magnetic Field Around Current Carrying Conductors.avi
Rules for Determining the Direction of the Magnetic Field.avi

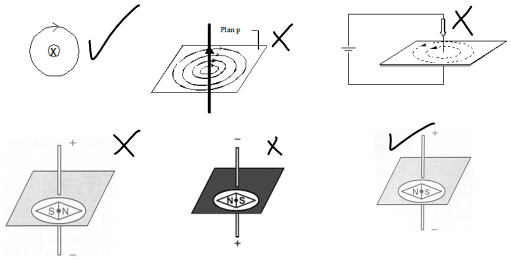
Bulls eye


= thumb points up away from paper

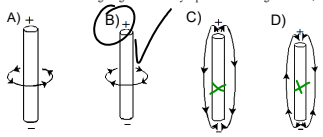

= thumb points into paper

Past exam questions

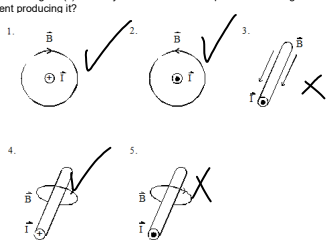
1. Which diagram(s) correctly show the relationship between the magnetic field and the electric current producing it?



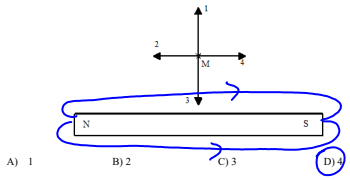
2. An electric current flows through a straight wire and produces a magnetic field.
Which of the following diagrams correctly represents this magnetic field?



3. Which diagram(s) correctly show the relationship between a magnetic field and the electric current producing it?

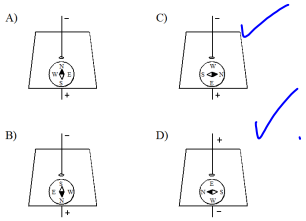


4. Given a point M in the magnetic field surrounding a bar magnet. Of the four arrows shown below, which one correctly shows the magnetic force which would act on a point charge at point M?

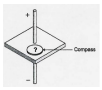


A) 1 B) 2 C) 3 D) 4

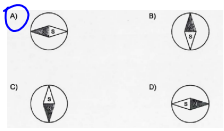
5. A magnetic compass is placed on the piece of cardboard near the wire. Which of the following diagrams shows the direction in which the compass needle will point?



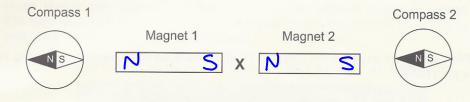
6. The following diagram shows a straight current-bearing wire that runs through a surface on which a compass has been placed.



Which of the following compass needles is pointing in the direction of the magnetic field produced by the current flowing through the wire?



7. The diagram below shows two compasses placed at the ends of the two magnets.



Which statement correctly describes the force acting between the two magnets at the location marked with an X?

A) The north pole of magnet 1 and the south pole of magnet 2 attract each other.
B) The south pole of magnet 1 and the north pole of magnet 2 attract each other.
C) The south pole of magnet 1 and the south pole of magnet 2 repel each other.
D) The north pole of magnet 1 and the north pole of magnet 2 repel each other.

Attachments

- Magnet_Mania!.avi
- News!_A_total_reversal_of_Earth's_Magnetic_Fields_is_coming!.avi
- Bermuda_Triangle__what_happened_to_Flight_19__-_BBC.avi
- Bermuda_Triangle_Coral_Castle_Mystery_Part_5_Conclusion.avi
- Crystal_Pyramid_in_the_Bermuda_Triangle.avi
- The_Right_Hand_Rule_and_the_Magnetic_Field_Straight_Wire.mp4
- Magnetic_Field_Around_Current_Carrying_Conductors.avi
- Rules_for_Determining_the_Direction_of_the_Magnetic_Field.avi