Class: Physics II, Dates: Lab performed 2/22/2023

Lab #5: Magnetic field.

by

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1. **Objective:**
2. **Introduction**:

The magnetic field is our way of describing the condition of space around a bar magnet or around any moving charge, such as the moving charges in a current. If a magnetic field exists at a certain point in space, any point charge "q" moving through that point in space will experience a magnetic force which is perpendicular both to the direction of the magnetic field and to the direction of "q". The Magnetic field is a quantity that has both Magnitude as well as Direction.

3. **Apparatus and Materials**:

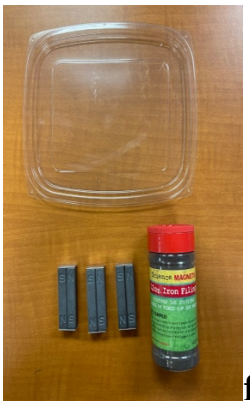
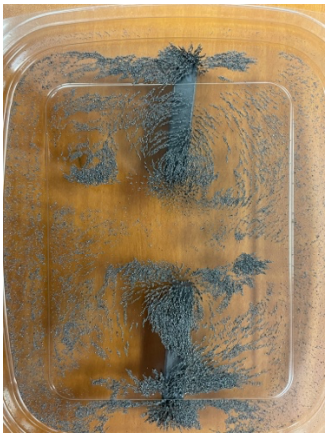


fig.1

fig.2



4. **Procedure and Results**:

We used a magnet, a clear tray and some iron flakes, by placing the clear tray over a magnet and the shake the iron particles around the magnet, we noticed that as we shake the flakes will became to arrange themselves almost magically across distinct lines. This a result of the North and South pole of each particle arranging with the magnetic field. There is a specific pattern from when we had two magnets with opposite poles in (fig.2) and then when we placed two magnets with alike poles (fig.3).

On the side the magnetic field is three-dimensional meaning the magnetic field extends all dimension from the North pole and wraps back around to the South.

On fig.2 is shown the magnetic field lines are close curves that do not intersect or merge with other field line, and they are going from one North pole of one magnet to the South pole of the magnet situated in front of the first one.
On fig.3 we can see how the magnetic field lines from one magnet aren't in the direction of the other magnet in front of the first one and this is due to both magnetic poles that we faced were the same South pole of each magnet and as we know the field lines follow a path from North pole to South pole and never from poles alike.

6. Conclusions

As a wrap up we can say that the magnetic fields line is closer to each other at poles but are widely apart at other places. More crowded the field lines, stronger is the magnet. The magnetic Field lines are like closed curves they emerge from North pole and merge to South pole. Inside the magnet, field lines are opposite (from South pole to North pole).

7. Question:

If there was a point of intersection between two field lines, that means that the magnetic field has two different directions. Is it possible?

No, a magnetic field only have one direction for the field lines from the North pole to the South pole.