

Magnets

Magnets have two _____ called _____

- _____ and _____ poles
- There are no _____ poles

Like poles _____, Opposite poles _____

Electromagnetism

- It was discovered that running _____ through a _____ produced a _____
- The magnetism around _____ magnets and _____ are very similar, so both must have common _____.
- _____ is the cause of all _____

Ferromagnetism

- Magnetic materials have an _____ outer _____.
- _____ near each other line up so that the unpaired _____ spin the _____ direction.
- This _____ creates _____

In permanent magnet the current is _____ in atoms.

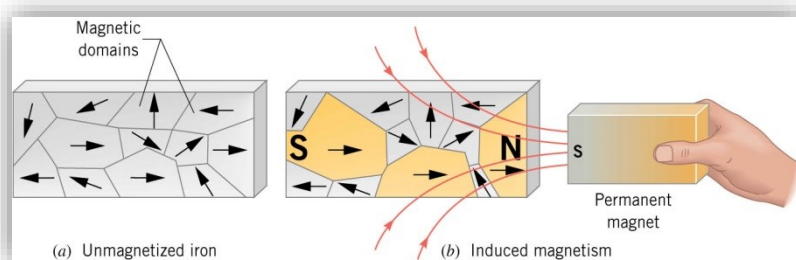
- Move around _____ and _____
- Most materials _____ out except in _____ materials

Ferromagnetic materials

- Electron magnetic effects _____ cancel over large _____ of atoms.
- This gives _____ magnetic _____ size of _____ to _____ mm called magnetic _____.
- In a permanent magnet, these _____ are aligned.
- Common magnetic materials are _____, _____, _____, and _____.

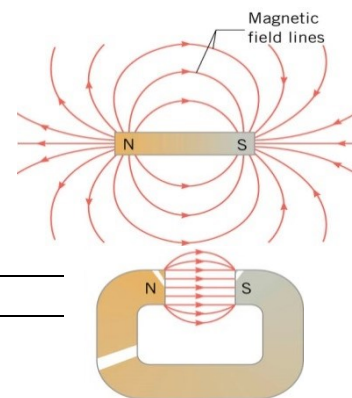
Induced Magnetism

- Usually the magnetic _____ are _____ arranged.
- When it is placed in a _____, the domains that are aligned with the B-field grow _____ and the orientation of other domains may _____ until they are aligned.
- This gives the material an _____ magnetism.



Magnetic Fields

- Around a magnet is a magnetic _____ (B-field)
- At _____ point in _____ there is a magnetic _____
- Can be seen with a _____
- Unit is _____ (T)



Magnetic Field Lines

- Magnetic fields can be _____ with field _____.
- Start at _____ pole and end at _____ pole
- The more lines in one area means _____ field

Practice Work

1. Sketch the magnetic field around the earth.
2. Is the Earth's magnetic field parallel to the ground at all locations? If not, where is it parallel to the surface? Is its strength the same at all locations? If not, where is it greatest?
3. (a) Sketch the magnetic field around a bar magnet. (b) Where is the field the strongest? (c) Where is it the weakest?
4. Compare and contrast electric and magnetic field lines.
5. Compare and contrast electromagnets and permanent ferromagnets.
6. What is the cause of all magnetic fields?
7. Explain how inducing a ferromagnet to have a stronger field works.