

# Chapter 1: Magnetism – Test Study Guide

## Properties of Magnets

- Material that attracts iron and materials that contain iron
- Lodestones – natural magnets
- Magnets attract or repel other magnets
- Magnets point north when allowed to swing freely

## Magnetic Poles

- Magnets have 2 ends called poles
- Magnets have NORTH and SOUTH poles
- Unlike poles attract (N to S, S to N)
- Like poles repel (N to N, S to S)

## Magnetic Force

- Attraction or repulsion between magnets
- Magnetic force strongest at poles

## Magnetic Fields

- Area of magnetic force around a magnet is MAGNETIC FIELD
- Magnetic field lines are invisible lines that map out magnetic field
- Magnetic field lines spread from one pole, curve around, return to other pole
- Closer magnetic field lines indicate stronger field
- Farther apart field lines indicate weaker magnetic field

## Inside a Magnet – The Atom

- Atom is smallest part of an element
- Atoms contain
  - Protons – positive charge
  - Neutron – no charge
  - Electron – negative charge
- Electron spin creates tiny magnetic field

## Magnetic Domains

- Magnetic fields of atoms in most materials point in random direction – no magnetic force
- Magnetic fields of atoms in magnetic materials point in the same direction – creates magnetic domain
- In magnetized material, all or most of the magnetic domains are arranged in the same direction
- Materials with strong magnetic properties are FERROMAGNETIC MATERIAL

## Making and Changing Magnets

- Magnets can be made, destroyed, or broken
- Magnets can be made of material that contain iron or other magnetic material by rubbing the object with the pole of a strong magnet, in one direction repeatedly. This causes the atoms in the object to become aligned, creating a magnetic domain.
- Temporary magnets: easily made, but do not stay magnetic for very long
- Permanent magnets: harder to make, but keep their magnetism for a long time
- Magnets can be destroyed by:
  - Heating
  - DroppingThis causes the magnetic domains to lose alignment, or become random
- When magnets break, each piece becomes a small magnet with a north pole and south pole