

**PHYSICS****DOMAIN THEORY****INDUCED MAGNETISM AND DOMAIN THEORY**

When placed in a magnetic field, some materials become magnetized. These materials include those containing *Iron, Nickel* or *Cobalt*. Because these materials contain properties that allow for magnetic induction, they are referred to as *Ferromagnetic*.

Domain Theory

The atoms of ferromagnetic substances may be thought of as tiny bar magnets with a N-pole and a S-pole. These atomic magnets, or *dipoles*, interact with neighboring dipoles. If a group of these dipoles line up in the same direction they form a *magnetic domain*. In an unmagnetized piece of iron, there are millions of dipoles, however they are not aligned together to form a magnetic domain.



PHYSICS

DOMAIN THEORY

Effects of the Domain Theory

- 1) **Magnetic Induction**
- 2) **Demagnetization**
- 3) **Reverse Magnetization**
- 4) **Breaking a Bar Magnet**
- 5) **Magnetic Saturation**
- 6) **Induced Magnetism by the Earth**

**PHYSICS****DOMAIN THEORY****Homework**

1. What is the name given to materials that are strongly attracted to one another by a magnet? Name two such materials, other than iron and steel.
2. Describe how a screw driver can become magnetized. What might happen if the screwdriver were heated or dropped? Explain your answer.
3. What name is given to the region in which a magnet influences other magnetic materials? How far does this region extend?
4. Describe two ways in which you could detect the presence of a magnetic field. Does any magnetic field exist in the spaces between magnetic field lines? Explain your answer.
5. Is the magnetic pole area in the northern hemisphere an N-Pole or an S-Pole? Explain.
6. Vertical retort-stands in laboratory classrooms are often found to be magnetized, and the polarity of such rods in Canada is opposite to the polarity of those found in Australia. Explain this statement.
7. Given two apparently identical bars of steel, one a permanent bar magnet and the other unmagnetized, and without the help of any other equipment, describe the method for determining which bar is the magnet.
8. Describe what would happen to a magnetic compass and to a dipping needle if each were placed **(a)** at the magnetic north pole, and **(b)** at the equator.