Chapter 20: The magnetic field: models of particles and magnetic fields

1. Be able to determine the direction of a magnetic field based upon the direction indicated by a compass.
2. Be able to sketch the magnetic field of bar magnets, of current in a long, straight wire, of current in a single loop, and of a solenoid with magnetic field lines.
3. Be able to use the right hand rule for currents to determine the orientation of magnetic fields created by currents in straight wires, in circular wire loops, and in solenoids.
4. Be able to describe the magnitude and direction of the force exerted by a magnetic field on a charged particle moving through the magnetic field using $\mathbf{F} = q\mathbf{v} \times \mathbf{B}$.
5. Be able to describe the magnitude and direction of the force exerted by a magnetic field on an electric current passing through the magnetic field using $\mathbf{F} = i\mathbf{l} \times \mathbf{B}$.
6. Be able to calculate the radius of the path of a charged particle of known mass, charge, and velocity in a magnetic field of known strength and direction (perpendicular to the particle velocity) or calculate the mass, given the radius, charge and velocity.
7. Be able to describe how a loudspeaker works because of the force exerted by a magnetic field on an electric current.
8. Be able to describe how a motor works because of the force exerted by a magnetic field on an electric current.
9. Be able to describe the difference between "hard" and "soft" magnetic materials.
10. Be able to describe the "domain" model of ferromagnetic materials and to list ferromagnetic elements. http://en.wikipedia.org/wiki/Ferromagnetism
11. Be able to describe things that you have observed that illustrate something we have dealt with in this chapter.