

OVERVIEW

- 1.) Earth's magnetic field and how the ends of a compass are defined (including the complete, formal name for each pole).
- 2.) Magnetic field lines and how magnetic field directions are defined (that is, how do you determine the direction of a magnetic field).
- 3.) Two MAIN differences between magnetic fields and electric fields.
- 4.) What *type* of force is generated by magnetic fields?
- 5.) Determining the force on a charge moving in a magnetic field (both magnitude and direction).
 - a.) How does this relate to a mass spectrometer?
 - b.) Be able to do a mass spec. problem, complete with velocity trap.
- 6.) Force on a current-carrying wire in a magnetic field (both magnitude and direction).
- 7.) What produces a magnetic field in general, and where magnetic fields come from in a bar magnet (Ampere's Theory of Magnetism).
- 8.) What kind of B-fld pole is found in the earth's north geographic hemisphere?

- 9.) How is the direction of a magnetic field defined?
- 10.) What technique do you use to determine the net direction of a magnetic field for:
- a.) A single current-carrying wire.
 - b.) Two current carrying wires.
 - c.) A coil.
- 11.) How do magnetic fields interact with one another when you have:
- a.) Two current-carrying wires.
 - b.) When all you have are the magnetic field lines from two sources?
- 12.) Torque generated in a current carrying coil pinned in an external magnetic field. (Don't take much time on this one.)
- 13.) Be able to reproduce and know how to use Lorentz's relationship. (mass spectrometer)
- 14.) Galvanometer design, and:
- a.) Using a galvanometer to make an ammeter.
 - b.) Using a galvanometer to make a voltmeter.

- 15.) How do each of the following devices work:
- a.) Door bell.
 - b.) Speaker.
 - c.) AC motor. (what's common to all motors)
 - d.) DC motor.
 - e.) what's the difference between a motor and a generator?
- 16.) If time, do bar sliding down incline in magnetic field problem.
- 17.) What did the Hall Effect prove?
- 18.) Right hand rules:
- a.) determine the direction of force on a charge moving through a magnetic field (or a current carrying wire in a B-fld)—this is the one that requires you to “wave in the direction of the B-fld”
 - b.) right thumb rule—to determine the circulation of a B-fld around a current-carrying wire—right thumb along the current, fingers wrap in direction of B-fld's circulation.
 - c.) direction of B-fld down axis of coil—put right hand on coil with fingers in direction of current flow—thumb will be in direction of B-fld down axis of coil.