**Magnetic Resonance Imaging:**

**Specific Goals for learning outcomes**

Students will learn and understand:

1. Moving charges generate magnetic fields in a particular direction and of a certain magnitude.
2. How electric currents in coils generate the magnetic fields used in MRIs.
3. Recall that MRIs require large magnetic fields.
4. Hydrogen is important for MRIs because it is present in different parts of the body and because of its configuration. Hydrogen shows up differently depending on how it’s configured with the body.
5. The Larmor frequency is the frequency [of radio waves] which can trigger hydrogen nuclei to flip. This frequency increases with the strength of the external magnetic field.
6. That to produce a gradient an additional set of solenoids creates variations in the magnetic field and thus a detectable variation in the Larmor frequency.
7. Gradient fields are used to select a slice during the MRI Scan, which gives a 2-d picture of a 3-d body