Chapter 21 – Magnetism

Section 21.1 – Magnets and Magnetic Fields

- _____ is the force a magnet exerts on another _____, on iron or a similar metal, or on _____.
- Magnetic forces, like electric forces, act over a _____.
- Magnetic forces, like electric forces, _____ with distance.
- All magnets have _____ magnetic poles, regions where the magnet's force is _____.
- One end of a magnet is its _____; the other end is its _____.
- _____ magnetic poles _____ one another, and _____ magnetic poles _____ one another.
- A _____ surrounds a magnet and can exert magnetic forces.
- A magnetic field, which is _____ near a magnet's poles, will either _____ another magnet that enters the field.
- The magnetic field _____ always travel from the _____ pole to the _____ pole of a magnet.
- _____ is like a giant magnet surrounded by a _____.
- The area surrounding Earth that is influenced by this field is the _____.
- Within an atom, _____ move around the nucleus.
- This movement, along with a property called _____, causes electrons to act like tiny _____.
- In many materials, each electron is _____ with another having an _____ spin, so magnetic effects _____ each other out.
- Many other materials have one or more _____ electrons, but the _____ usually don't combine because the _____ of atoms is not right.
- In a few materials, such as iron, nickel, and cobalt, the _____ make a strong _____.

- Then the fields combine to form _____.
- A _____ is a region that has a very large number of atoms with _____ magnetic fields.
- A _____ can be magnetized because it contains _____.
- When a material is _____, most of its magnetic domains are _____.
- If the _____ of a ferromagnetic material are aligned _____, the magnetization of the domains is _____, and it is not a magnet.
- If a ferromagnetic material is placed in a _____, then the electron domain can _____ which produces a _____.
- _____ are materials whose domains will stay _____ for a long time.
- No matter how many times you _____ a magnet, each piece will always have a _____.

Section 21.1 Assessment

- Describe the interaction of magnetic poles.

- What two things can happen to a magnet entering a magnetic field?

- What makes a material magnetic?

- Describe what happens to the fields of two bar magnets when you bring their north poles together.

- What happens if you suspend a bar magnet so that it can swing freely?

- How are electrons responsible for magnetism?

Section 21.2 - Electromagnetism

- _____ and magnetism are different aspects of a single force known as the _____.
- The electric force results from _____.
- The magnetic force usually results from the _____ in an atom.
- Both aspects of the electromagnetic force are caused by _____.
- _____ electric charges create a _____.
- The magnetic field lines form _____ around a straight wire carrying a _____.
- A _____ moving in a magnetic field will be deflected in a direction _____ to both the _____ and to the _____ of the charge.
- If the current is _____ to the magnetic field, the force is _____ and there is no _____.
- The magnetic fields of _____ combine so that a coiled wire acts like a _____.
- A _____ of current-carrying wire that produces a magnetic field is called a _____.
- If you place a _____, such as an iron rod, inside the coil of a solenoid, the strength of the magnetic field _____.
- The magnetic field also _____ as the _____ increase.
- An _____ is a solenoid with a _____.
- Changing the _____ in an electromagnet controls the _____ of its magnetic field.

Section 21.2 Assessment

- Besides a magnet, what can create a magnetic field?

- How is the magnetic field of an electromagnet controlled?
- How does a ferromagnetic rod inside a solenoid affect the strength of an electromagnet?
- What is the effect of a magnetic field on a stationary electric charge? On a moving electric charge?
- Why is it a good idea to have the coil of a solenoid wound closely with many turns of wire?