

Magnetism - Outline

1. For given situations, predict whether magnets will repel or attract each other.
2. Describe the magnetic field around a permanent magnet.
3. Describe the orientation of Earth's magnetic field.
4. Describe the magnetic field produced by current in a straight conductor and in a solenoid.
5. Use the right-hand rule to determine the direction of the magnetic field in a current-carrying wire.
6. Given the force on a charge in a magnetic field, determine the strength of the magnetic field.
7. Use the right-hand rule to find the direction of the force on a charge moving through a magnetic field.
8. Determine the magnitude and direction of the force on a wire carrying current in a magnetic field.

Notes

•Magnets

✓ Like and Unlike Poles:

✓ Magnetic Domains:

•Magnetic Fields

✓ Magnetic Flux:

✓ Earth's Magnetic Field:

•Magnetic Field and a Current-Carrying Wire

✓ A Long Straight Wire:

✓ Right-Hand Rule #1 (RHR1):

•Magnetic Field of a Current Loop

✓ Solenoid:

- Charge Particles in a Magnetic Field

- ✓ Force Exerted on a Charged Particle in a Magnetic Field:

- ✓ Right-Hand Rule #2 (RHR2)

- ✓ Path of a Charged Particle in a Magnetic Field

- Magnetic Force on a Current-Carrying Conductor

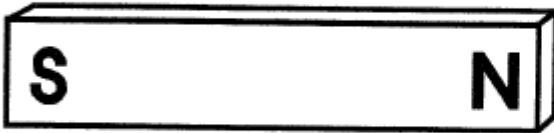
- ✓ The Force Between Two Parallel Conducting Wire:

- **Sample/Practice Problems**

A. Magnetic Fields

1.

Sketch the magnetic fields of the following magnets.

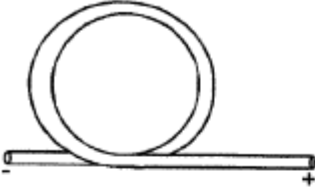
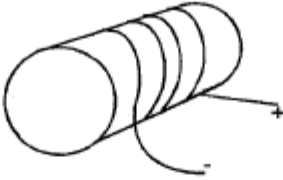
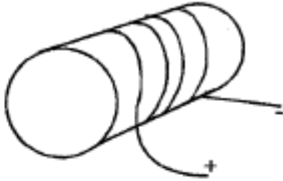

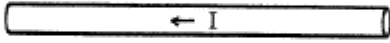

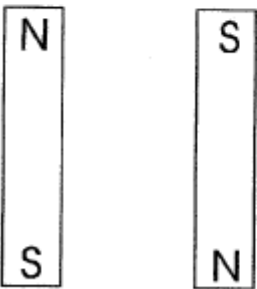
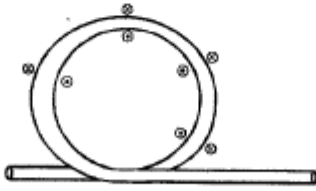
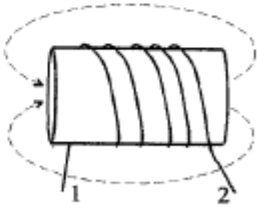


2. Use the first right hand rule to determine and sketch in the magnetic fields created by these two current bearing wires.


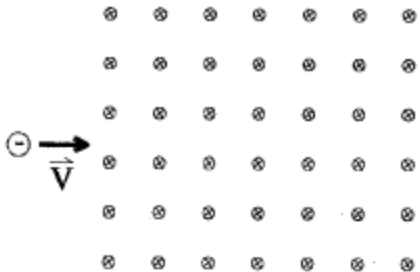


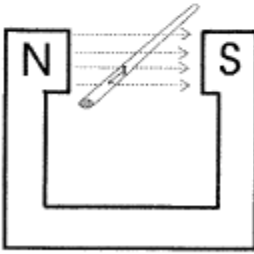
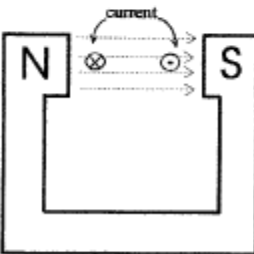


B. Magnetic Fields and Direction of Current

Directions: Answer each of the following questions based on your knowledge of magnetism.

 <p>a) Show the direction of the current. b) Sketch the magnetic field including the direction of it.</p>	 <p>a) Show the direction of the current. b) Sketch the magnetic field including the direction of it.</p>	 <p>a) Show the direction of the current. b) Sketch the magnetic field including the direction of it. c) Would the North end of a compass point to the near or far end?</p>
 <p>If this represents the current, sketch the magnetic field.</p>	 <p>Sketch the magnetic field about this current bearing wire.</p>	 <p>If this represents the current, sketch the magnetic field.</p>
 <p>Sketch the magnetic field about these two bar magnets.</p>	 <p>Draw in the direction current is traveling in this wire loop, if the magnetic field is represented.</p>	 <p>a) Label the diagram as to which end of the solenoid is N or S. b) Which terminal on the solenoid is positive? _____</p>

C. Charged Particles in a Magnetic Field

 <p>Which direction will this charge, traveling with a velocity \vec{V}, move when it encounters the magnetic field as shown above?</p>	 <p>Which direction will this charge, traveling with a velocity \vec{V}, move when it encounters the magnetic field as shown above?</p>
 <p>Draw in a magnetic field that would make this moving charged particle curve into the paper.</p>	 <p>Draw in a magnetic field that would make this moving charged particle curve into the paper.</p>
 <p>Draw in the force acting on the current bearing wire.</p>	 <p>Draw in the force acting on each current bearing wire.</p>