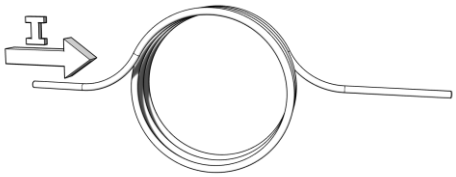
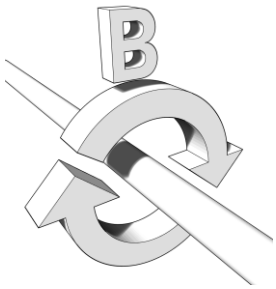
Physics 200
Magnetism Quiz Review *Quiz Format – Multiple Choice with no penalty for guessing; corrections as usual.*

Part 1: Sample Magnetism Quiz Questions

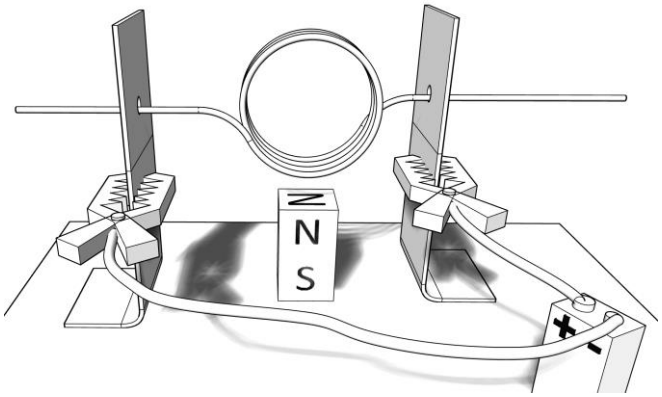
1. The diagram below shows the direction of current flowing through a coil. This creates a magnetic field. Is that field directed away from us or toward us?



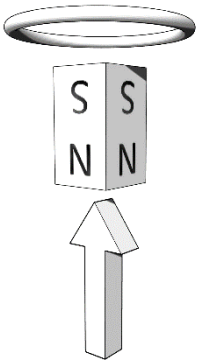
2. Given the direction of the magnetic field, B, is the current in the wire traveling toward us or away from us?



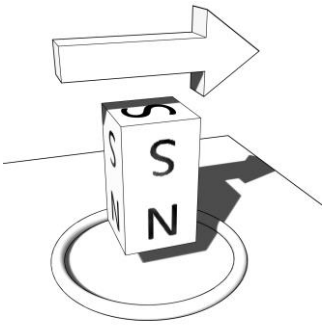
3. As current flows from the battery through the wires below, will the top of the motor coil move toward us or away from us? The magnet is positioned directly beneath the coil.



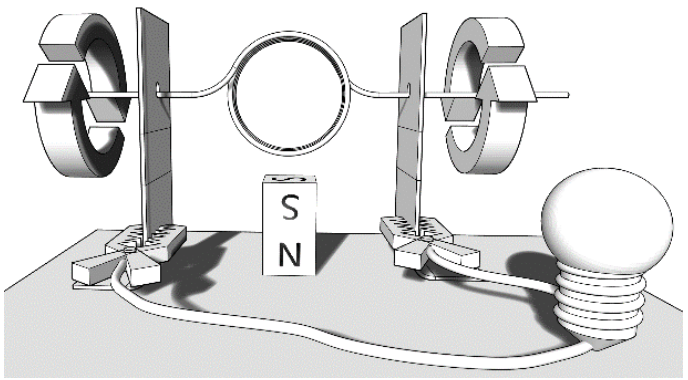
4. In the diagram below a magnet is being pushed into a stationary conducting ring. In what direction is the induced current flowing through the near side of the ring?



5. In the diagram below a magnet is being moved rightward. Below the magnet is a stationary conducting ring. As the magnet continues to move, in what direction will the induced current flow through the near side of the ring? Will it flow to our left or to our right?



6. A student is rotating the coil below in the direction shown by the arrows. This causes the apparatus to function as a generator, and the generator sends current to the light bulb. Through which wire does current flow into the bulb, the left wire or the right wire?



Part 2: What you would write if you were making quiz corrections (you may want to type them):

1. If you grab the coil with your right hand, curling your fingers through it, and you point your thumb in the direction of current, your fingers will **point into the paper.**

2. If you grab the wire with your right hand and curl your fingers so that they point in the direction of the magnetic field, and then you point your thumb along the wire, **your thumb will point away from us**, in the direction of the current.

3. Current flows from positive to negative, so it will flow into the right side of the coil and rotate around the coil clockwise. Therefore, at the top of the coil, current is flowing rightward. Furthermore, the magnet is creating an upward field. Using your right hand, if you point your fingers upward, and you point your thumb to the right, your palm will be facing out of the paper. Therefore, **the top of the coil rotates toward us.**

4. The magnet has a downward field. As the magnet moves closer to the ring, more field lines pass through the ring. To counteract the strengthening downward field, an upward field is induced in the ring. If you grab the ring and curl your fingers around it so that they point upward through it, your right thumb can only point **to the right along the near side of the ring**. That is the direction of induced current.

5. The magnet has a downward field. As the magnet moves to the right, it will no longer be pointing directly through the ring. As the number of downward field lines passing through the ring decreases, an induced downward field will be created by the ring to counteract the magnet's decreasing downward field. If you grab the ring and curl your fingers around it so that they point downward, your thumb will have to point **leftward along the near side of the ring**. That is the direction of induced current in the ring.

6. The permanent magnet has a downward field, so in the initial coil position, no field lines pass through the coil. As the top of the coil rotates away from us, more downward field lines flow through the coil. To counteract this strengthening downward field, an upward field forms in the coil. If you allow the coil to rotate a bit, so that it is in a less vertical plane, and then you grab the coil with your right hand so that your fingers go up through the coil, and you point your thumb along the wires, you will find that your thumb points to the right along the near side (formerly the bottom, before the coil rotated) of the coil. According to the diagram, this means current will exit the generator on its left side and flow to the bulb through the **wire on the left.**

Part 3: Content that you need to understand and be able to apply

- How magnets interact – opposite vs same polarities
- Magnetic field lines
    - Where they enter and exit, base on magnet polarity
    - Field strength is proportional to
        - Number of lines leaving magnet
        - Proximity of lines
    - Infer a magnet's poles from its field lines
- Draw Earth's magnetic field in proper relation to the Northern and Southern hemispheres.
- Know and be able to apply the Right Hand Rules.
    - Curled fingers, for finding B or I
    - Straight fingers, for finding B, I, or F
- Understand how a solenoid buzzer works.
    - Be able to recognize possible problems with a solenoid buzzer design.
    - Be able to draw and explain a solenoid buzzer design
- Understand how a simple motor works.
- Know and be able to apply Lenz's Law.
- Understand how a magnetic pickup works.