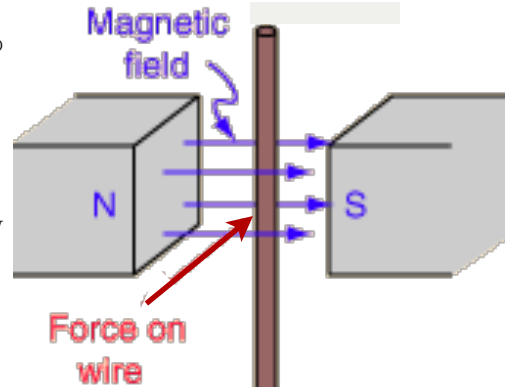


Name: _____

Lab Quiz 08: Magnetic Induction

Answer each of the following questions using the information you collected during the lab. Please submit your completed quiz before you leave the lab. No papers will be accepted after the end of the lab period. Each question is worth 2 points.

A wire is placed between the poles of a permanent magnet as shown. When the current is switched on, the wire experiences a force directed straight into the page.



- True or false:** The direction of the current in the wire is up.
- True or false:** The magnitude of the force is proportional to the current, so more current means more force.
- True or false:** Reversing the direction of the current at the power supply reverses the direction of the force.
- True or false:** Turning the magnet upside down has no effect on the direction of the force on the wire.



A long straight wire is surrounded by a ring of small magnetic compasses, as demonstrated in lab. A current passes through the wire.

- True or false:** When the current is switched on, the compass needles all move to point directly outward, radially away from the wire.
- True or false:** When the direction of the current is reversed, the compass needles reverse, and point in the opposite direction.

You are testing the wire coils by passing a magnet through a coil that has been attached to a galvanometer.



- True or false:** Passing a magnet through the 1-turn coil impressed more voltage than the 100-turn coil.
- True or false:** The slower the magnet is pulled through the coil, the less voltage is impressed.
- True or false:** Using a stronger magnet would make no difference. Only the number of coils matters.



In the picture shown on the left, the wire is attached to the leads of a hand-crank generator. A magnetic compass is placed below the wire as shown, and initially it is lined up parallel to the wire.

- True or false:** When you crank the generator, the compass needle will turn 180° in half-circle. The red end, pointing right, will turn until it points exactly to the left.
- True or false:** Cranking the generator clockwise deflected the compass needle in the opposite direction as cranking counterclockwise.

You now clip the leads of the generator to the terminal posts of the light bulb.

- True or false:** Cranking clockwise lights the bulb, but cranking counterclockwise has no effect at all.
- True or false:** The faster you crank, the brighter the bulb gets.

You clip the leads of one hand crank generator to the leads of a second: you attach the **red to the red** and the **black to the black** wire. When you crank one generator **clockwise**, the other crank also turns **clockwise**.

- True or false:** Cranking the first generator counterclockwise would not effect the second crank, which would continue to spin clockwise.
- True or false:** If you reverse the leads (red to black and black to red), a clockwise turn of the first would still cause a clockwise spin of the second generator.
- True or false:** You stop cranking the first generator. If you crank the second generator instead, the first remains stopped. The current can only flow in one direction.
- True or false:** All these demonstrations prove that electricity and magnetism are closely related phenomena.