

# Physics Assignment

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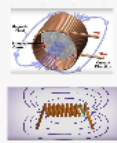
## How Does This Work?

- Approximately 110 volts are directed to a high voltage power supply
- The high voltage power supply charges a capacitor to 8000 volts
- The operator triggers the switch to close, causing two brass electrodes to come in close contact
- A spark forms between the two electrodes, completing the circuit and causing a current to flow through the coil
- The current increases up to about 50,000 Amps

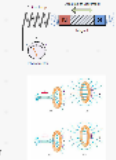


## The Physics Behind It

- The coin is placed inside of the coil
- According to **Oersted's Principle**, an electric current flowing through a wire generates a magnetic field surrounding the wire
- Therefore, as the current passes through the coil of wire, a rapidly increasing magnetic field is generated
- The magnetic field lines inside the coil are all pointing in the same direction and as a result they add to give a stronger field



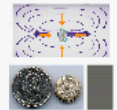
- According to **Faraday's Law**, any change in the magnetic field surrounding a conductor will cause current to be induced in the conductor



- The coil of wire generates a changing magnetic field, and this in turn causes current to be induced within the coin

- Following **Lenz's law**, the directions of the magnetic field surrounding the coin and the coil strongly oppose each other

- Charge particles moving through a magnetic field are subject to a force called the **Lorentz force**



- Because of the opposing directions of the magnetic fields, there is a tremendous repulsive force between the coil and the rim of the coin

- As a result, the coin experiences a force inward which causes it to shrink

- The coil experiences a force in the opposite direction, which causes it to explode outward



By Ava Chaplin

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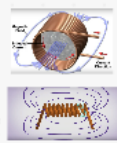
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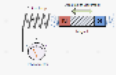


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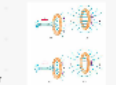


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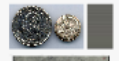
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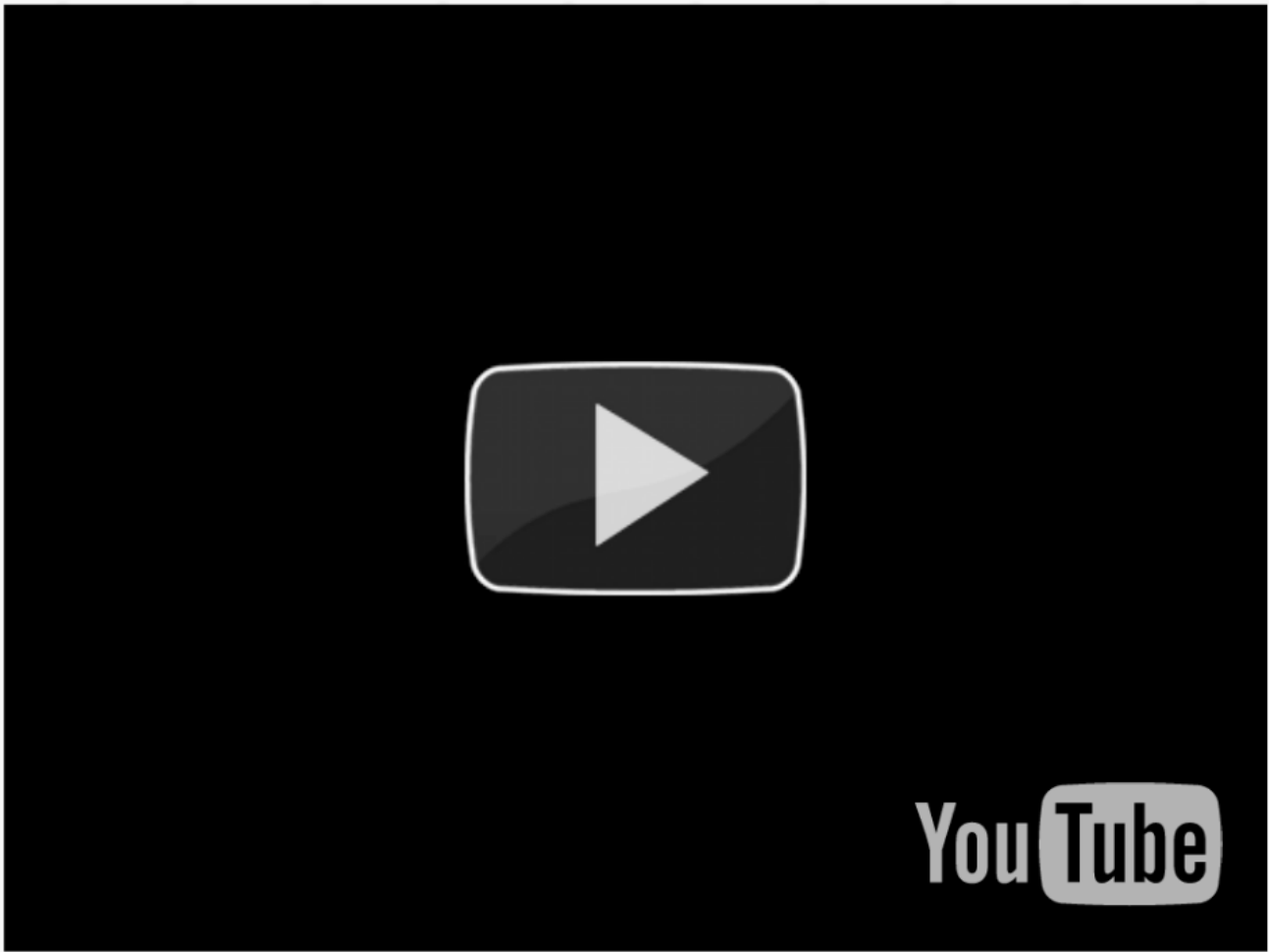


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