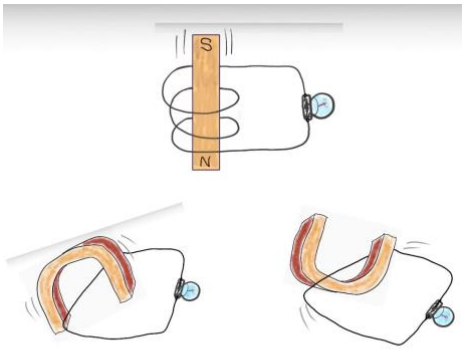
PHYSICS

Induction

- **Historical Review**:
  - **Over 13 scientists independently discovered electromagnetism.**
  - **_____ in USA – Lightning is Electricity**
  - **_____ in Italy - Battery**
  - **_____ in Denmark – Electricity produces Magnetism**
  - **_____ in England – Generator, Motor, Transformer**
  - **_____ in Germany – Field**

- **Induction: voltage is induced by _____ between a conductor and a magnetic field.**
  Examples: credit card, traffic light, tape recorder, metal detectors.



- **Two of the most important laws in Physics:**
  _____ Law: An electric field is created in any region of space in which a magnetic field is changing with time.

Electric current is induced when either a magnetic field moves near a wire or the wire moves relative to the magnetic field.

- **_____ Law: A magnetic field is created in any region of space in which an electric field is changing with time.**

- **Better Generators**
  Generators often _____ coils. This naturally makes AC current.

- **Nikola Tesla**
  - **Tesla built _____, AC _____, and _____ that are still in use today.**
  - **The _____ is a tuned transformer. It is tuned to make best use of the *resonant frequency* of a circuit to optimize voltage.**

- **Transformers**
  - **Two coils that are aligned cause a transfer of energy. The magnetic field induced in the first coil generates current into the second coil.**

- **Self Induction: every coil induces its own magnetic field that induces a voltage that opposes the original. This is called a back _____ or back emf.**