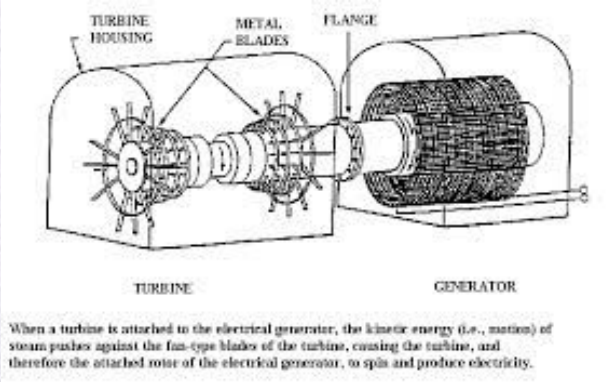
Topic 6 – Generators and Motors

https://www.youtube.com/watch?v=nfV87TgYH78 → Motors video

Generators

- -A device that converts movement (mechanical energy) into electrical energy is called an **electric generator**

Depends on relationship of electricity and magnetism



When a turbine is attached to the electrical generator, the kinetic energy (i.e., motion) of steam pushes against the fan-type blades of the turbine, causing the turbine, and therefore the attached rotor of the electrical generator, to spin and produce electricity.

Generators

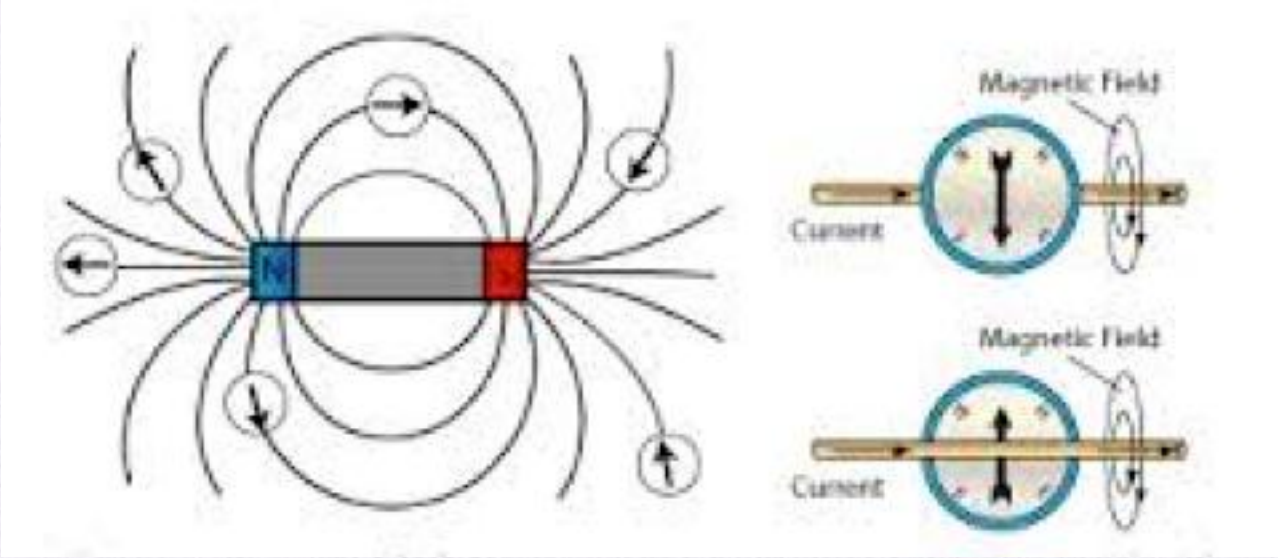
-GENERATORS generate (produce) electricity!

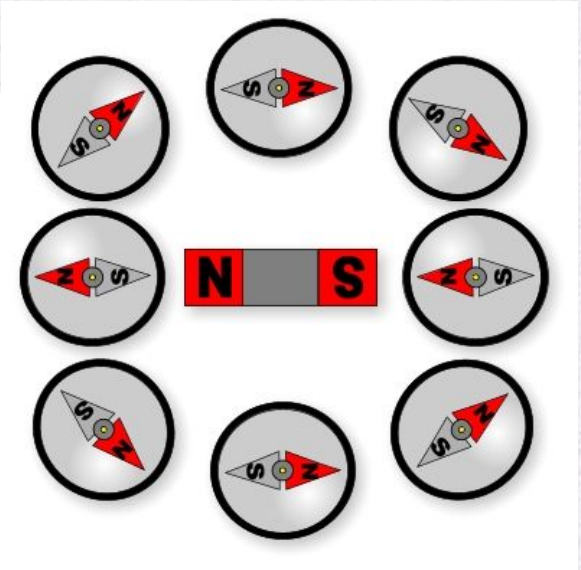
- Magnets pull on electrons, which cause the electrons to move in one direction → this movement is called **Magnetism**

Electricity and magnetism

- Compasses were affected by magnets. The electrical current created a magnetic field

Compass pointed towards direction of the field

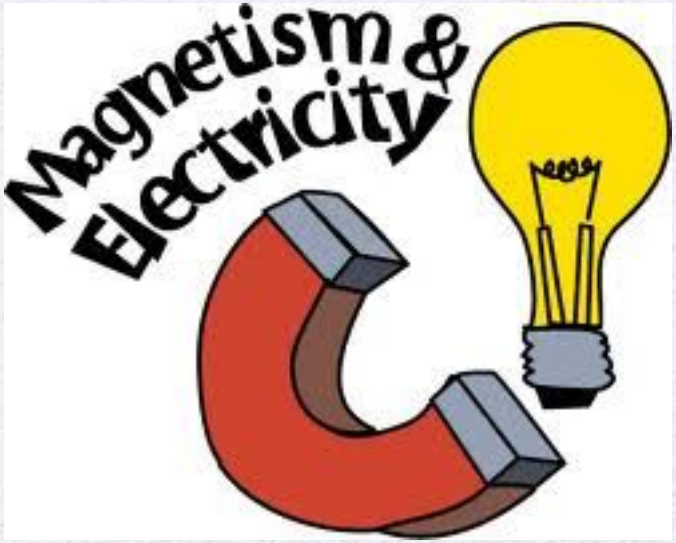




Electromagnets

- When electricity flows, it aligns the electrons in one direction much like a magnet

→ therefore, current electricity can be use to create a strong magnetic field

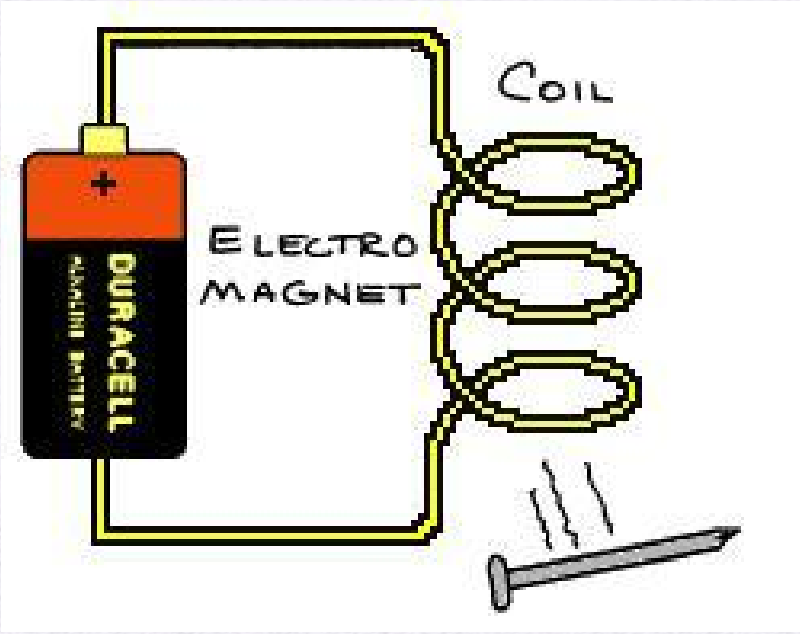


Electromagnet

1) Use a soft iron core (such as a nail) in the middle

2. Coil wire around the iron core

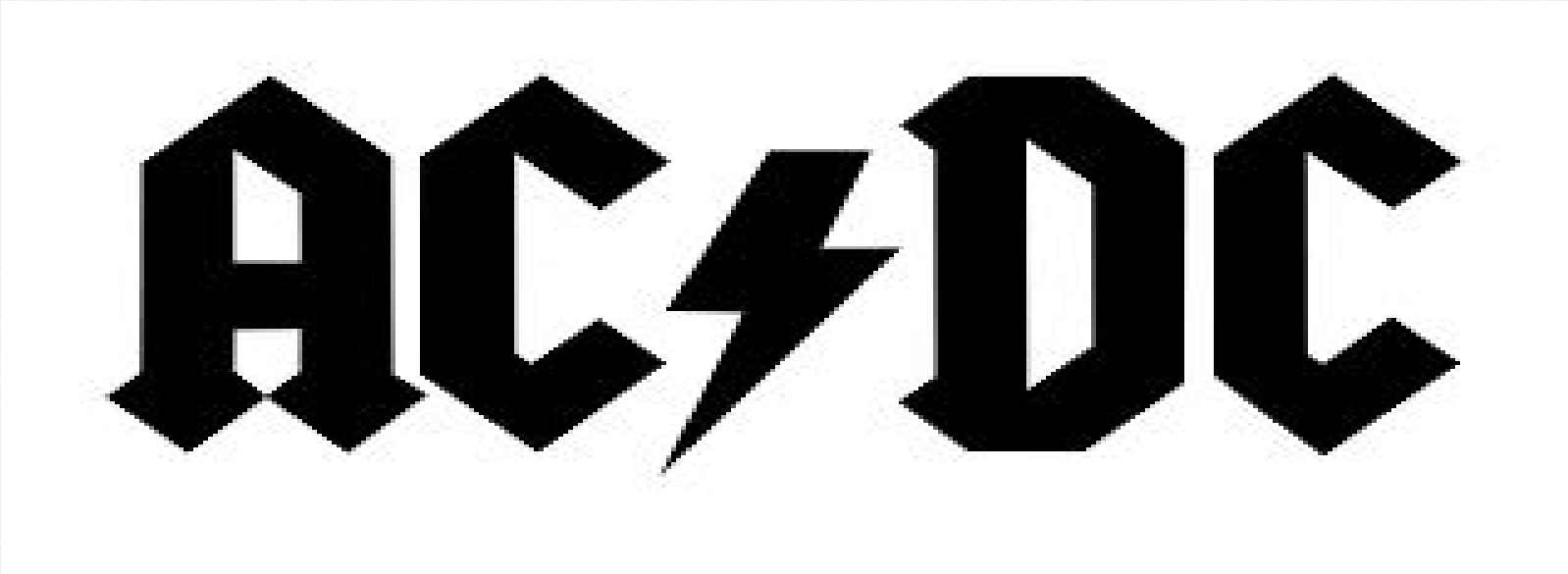
Demagnetizes when electricity turns off



Increase strength:

1) Size of core
2) Strength of current flowing
3) Number of coils

Flowing back and forth



Alternating current (AC)

- AC generators alternate direction of current

e^- flow in one direction, then change. About 50-60 times a second

→ Used in our houses and powerlines

https://www.youtube.com/watch?v=i-j-1j2gD28#t=22

Direct current (DC)

- Direct Current generator has a current that only flows in one direction

- - Uses a device called a split ring commutator to make e^- go in only one direction

→ Used in batteries, thermocouples

STOP

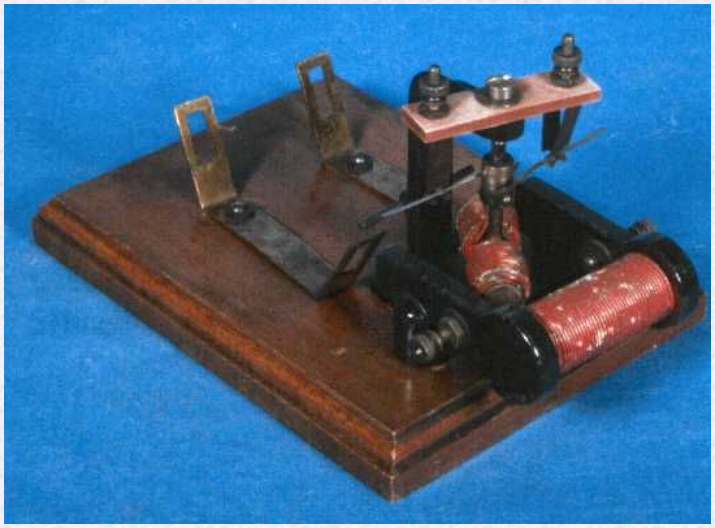
- Alternative energy assignment is due next THURSDAY

- Homework questions 1 are due this Thursday

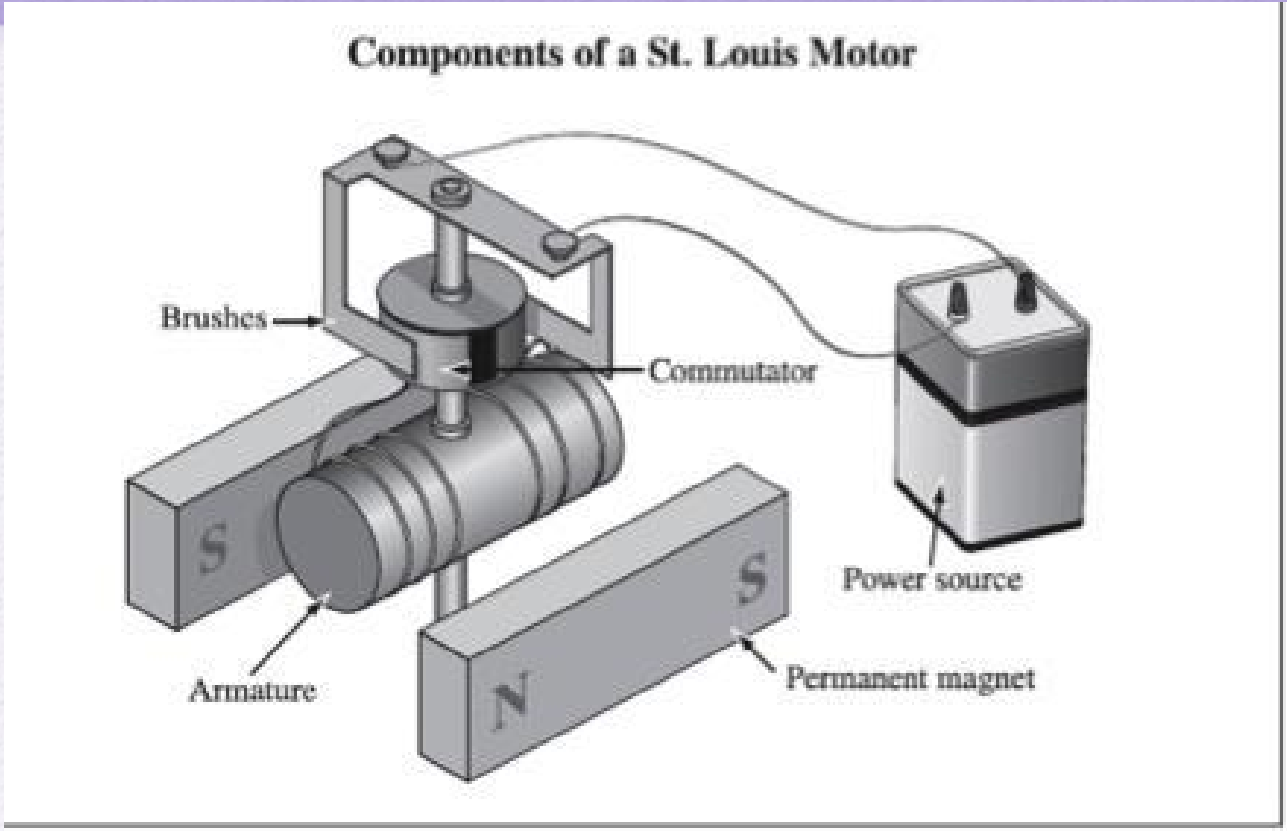
MOTORS

- An electric motor can be constructed in exactly the same way as a generator
- Where generators use movement to create electricity, motors use electricity to create movement
  - → They're opposites!

- One of the most common motors is the **St. Louis Motor** (DC Motor)



St. Louis Motor



Which motor component functions as an electromagnet?

A. Permanent magnet
B. Power source
C. Commutator
D. Armature

- https://www.youtube.com/watch?v=d_aTC0iKO68 (0:25 sec in)