



Lightning and Capacitors

Shocking and Charged!

Lights off learning

- Conductors, Insulators, and Semiconductors
- Polarization
- Path of least resistance
- Charge location
- Electric fields
- Coulomb and his law
- Electrophorus
 - Alessandro Volta

Quiz #3: Electrostatics

- Closed notes, closed computers, no help from neighbors, no talking.
- 10 points
- One or two word answers
- Roughly 7-8 minutes
- Get out a sheet of paper

Quiz #3: Electrostatics

1. What is one characteristic of a conductor? Example of a conductor?
2. What is one characteristic of an insulator? Example of an insulator?
3. Charged objects attract neutral objects by the process of _____.
4. How do we explain being able to hold an iron nail between the two ends of the Wimshurst generator and not have to worry about being shocked because the ark doesn't travel through us?
5. Where is the charge of a charged object located?
6. Draw the electric field of a proton.
7. What is the force between two charges of 1 C and $5\mu\text{C}$ that are separated by 3 meters?
8. Who improved and popularized the electrophorus?
9. Extra Credit: Who is $F_e = Kq_1q_2/d^2$ named after?

Make-up or Improve Quiz Score

- Write a paragraph (roughly 5 sentences) about Coulomb and his contributions to electricity and magnetism. You can also include some of his other contributions. Max 10 sentences. Maximum points is 10. Due Monday March 12th.

Disposable cameras capacitor

- Demo showing camera and it's flash
- Other unique capacitors

Show Caddy Shack

- Lightning clip.

Super Slow motion Lightning

- <https://www.youtube.com/watch?feature=endscreen&NR=1&v=RLWIBrweSU8>

Airplanes being hit by lightning

- Video
- <https://www.youtube.com/watch?v=emCcbawLVx4>
 - Airplane hit by lightning

Upward lightning

- <https://www.youtube.com/watch?v=RDDfkKEa2ls>

Fulgurite

- <https://gaggle.net/gaggleVideoProxy.do?op=view&v=a7059407f66417d83e885166f37b59c0>
 - 50:45-51:45

Superconductors

- Conductors and Insulators (very specific materials) cooled to a temperature such that these materials exhibit ZERO resistance to current running through it.
- Combining this idea with Lenz's Law we get a very neat effect known as the Meissner Effect.
 - The superconductor opposes magnetic flux so much that it is equal and opposite magnetic field.
 - Magnets levitate over it.