

Electrostatics

'ηλεκτρον - transliterated - elektron
- translated - amber

16th Century - William Gilbert - physician to QEI

De Magnete - treatise on electricity and magnetism \Rightarrow Father of electromagnetism
- found that some substances could be "elektrified"

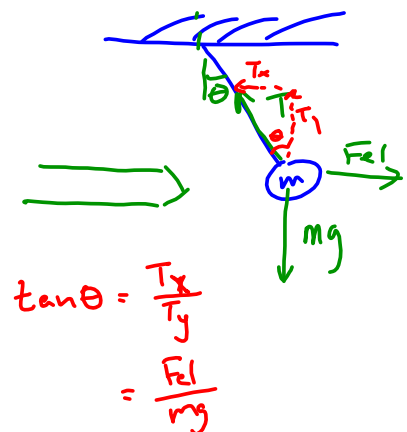
18th Century - Stephen Gray & Charles Dufay

- All substances can be elektrified but to varying degrees.

By Benjamin Franklin's time. . .

Supported by experiment:

1. Charged objects attract uncharged objects
2. Two charged objects can attract or repel
3. As the distance between two charged objects decreases, the electrical force increases.
4. The electrical force is much greater than the gravitational force
5. The electrical force acts through a vacuum.



Ben Franklin realized that statements 1 & 2 implied

- There are (at least) 2 types of charges.
positive and negative. Uncharged objects have
equal amounts of + and -.
- + charge → the charge left on a glass rod
when rubbed with silk.
- charge → the charge left on rubber when
rubbed with wool (or fur).


Law of Conservation of Charge

The total charge in a closed system remains constant regardless of the interactions taking place within the system.

So ... can we create charge? Yes we can. But we can't create NET charge.

Charge can be transferred from one object to another, but net charge can't be destroyed.

Transfer of charge - 3 options

- 1) positive charges could transfer
- 2) negative charges could transfer 
- 3) both + and - charges transfer

Conductors and Insulators