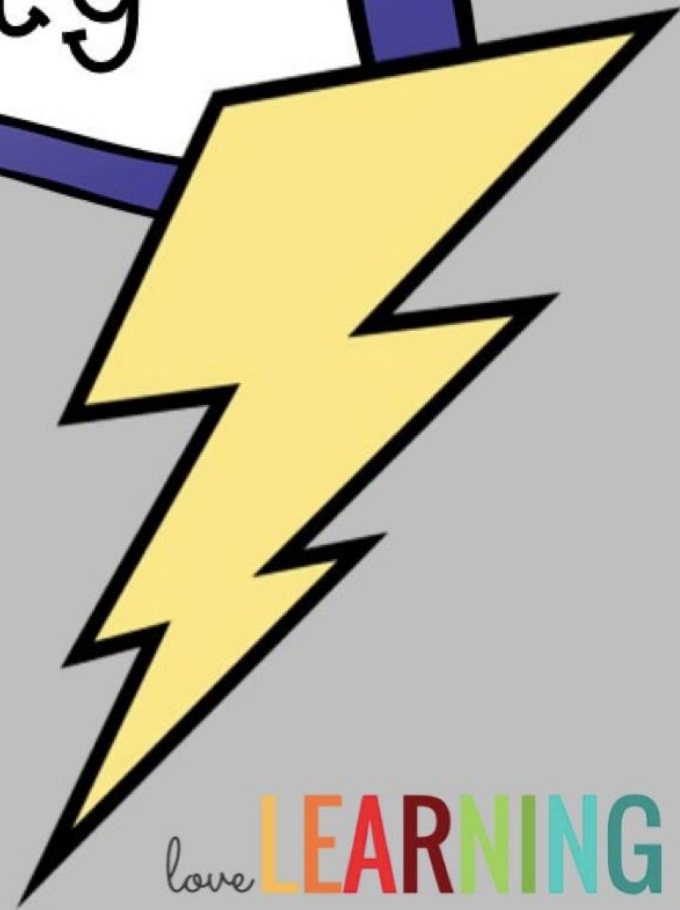


# Static Electricity



# Review

What is matter?

Anything that has mass and takes up space.

# Review

What makes up matter?

Atoms

# Review

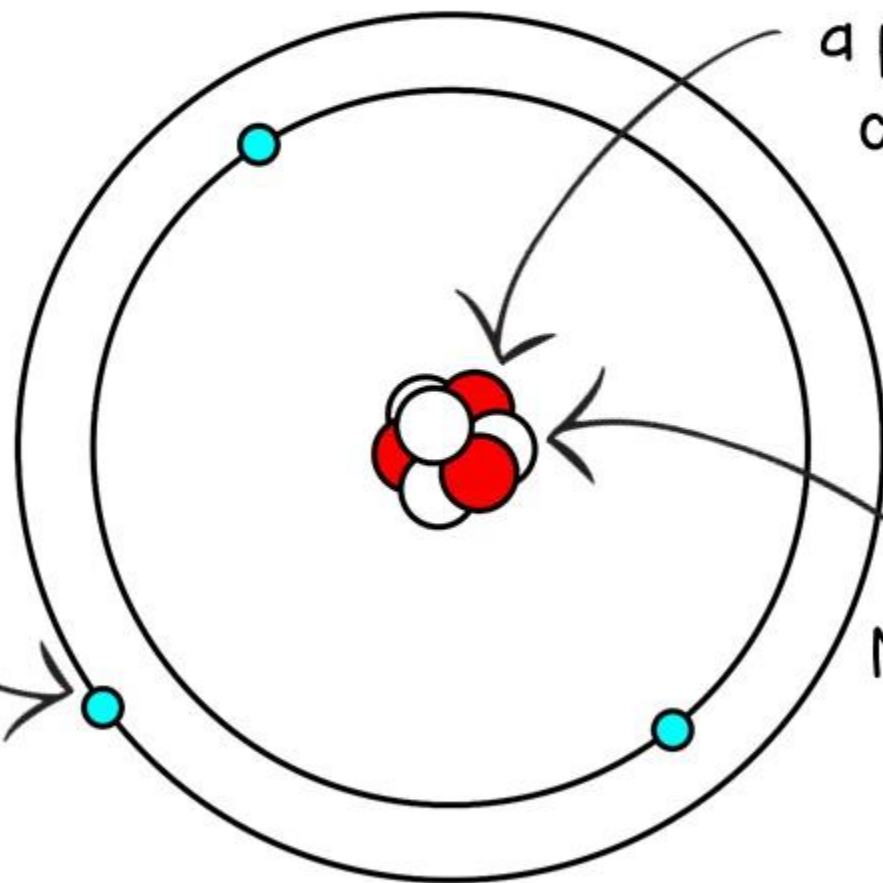
What are the three  
particles in an atom?

Protons, Neutrons, and Electrons

# Review

Protons have  
a positive  
charge

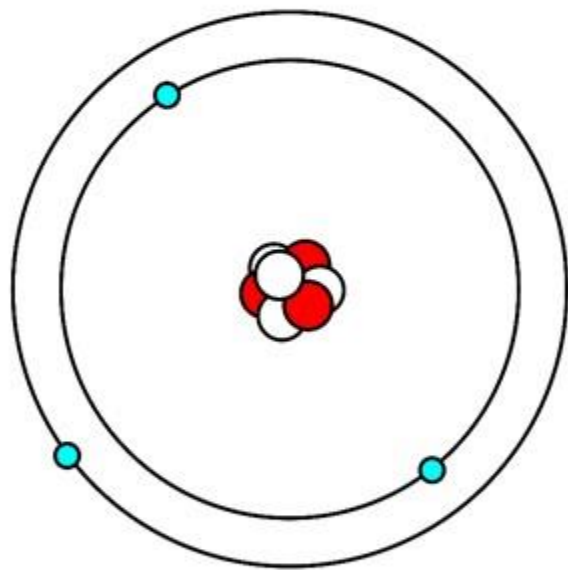
Electrons  
have a  
negative  
charge



Neutrons have  
a neutral  
charge

# Electric Charges

Most objects have a neutral charge



They have the same number of positive and negative charges



# Electric Charges

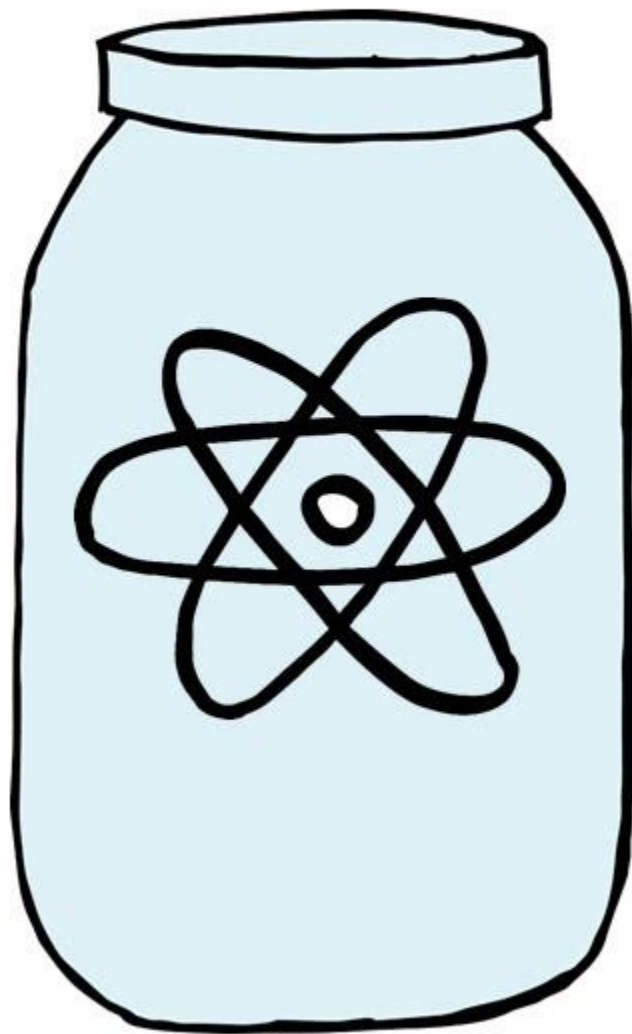
- Since protons and neutrons are located inside the nucleus of the atom, they are held there very tightly.



Electrons can jump from one atom to another because they are located outside of the nucleus.

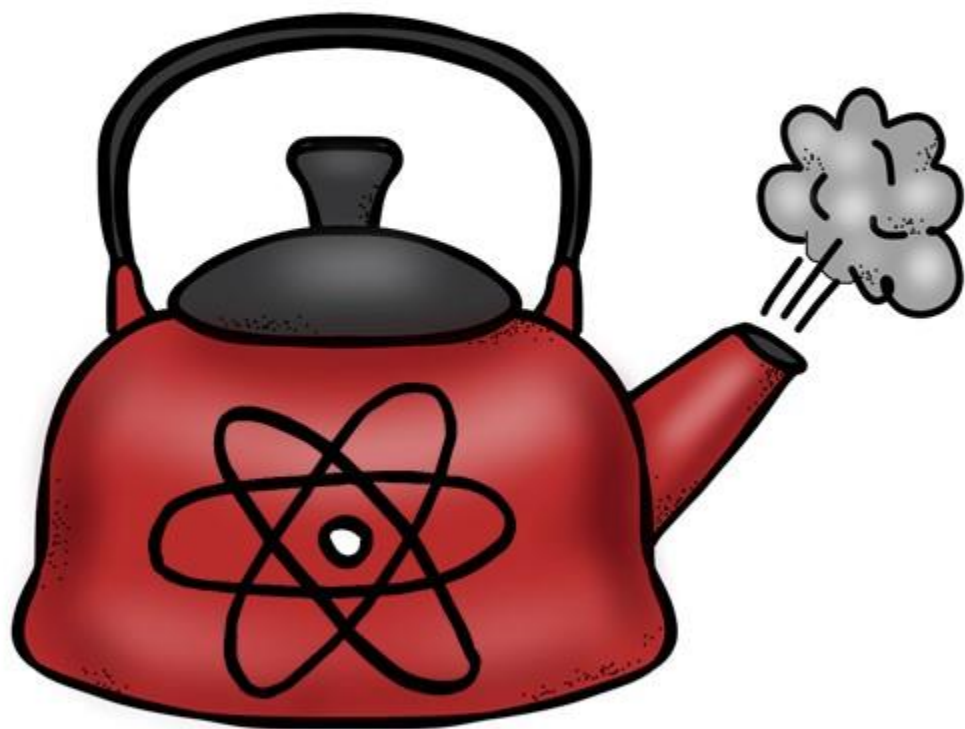
# Electrons

Some objects like glass, plastic, and cloth do not give up their electrons very easily. They are called insulators.





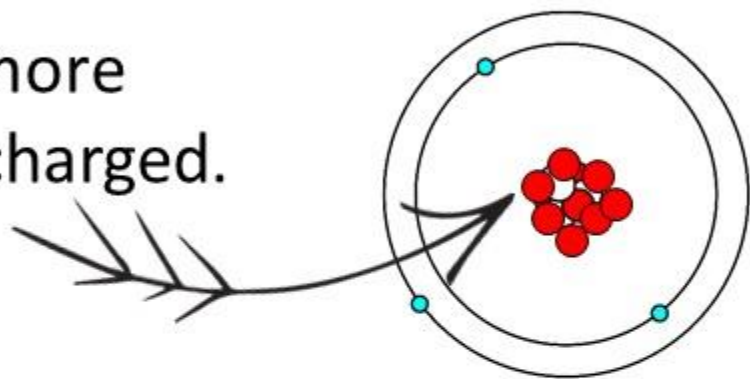
# Electrons



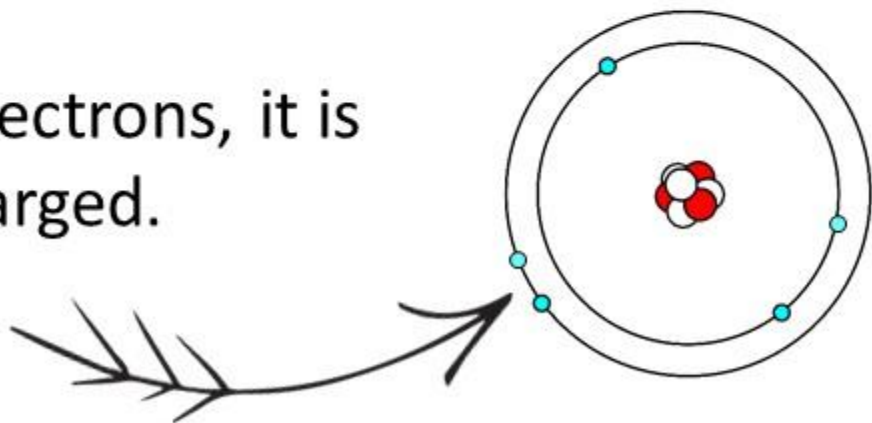
Other objects like metals, water, and dry air hold their electrons very loosely. They are called conductors.

# Electric Charges

When an atom has more protons, it is positively charged.

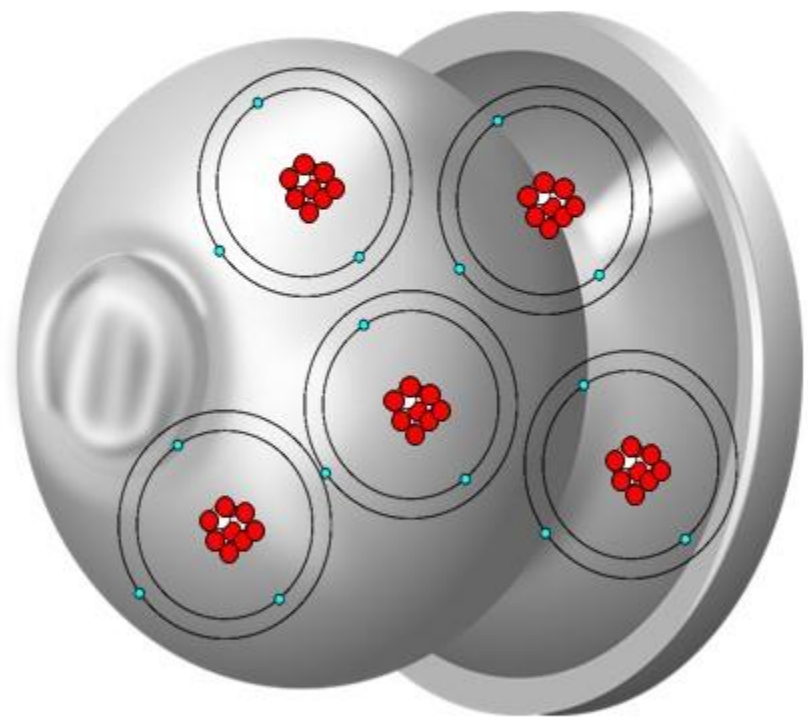


When it has more electrons, it is negatively charged.



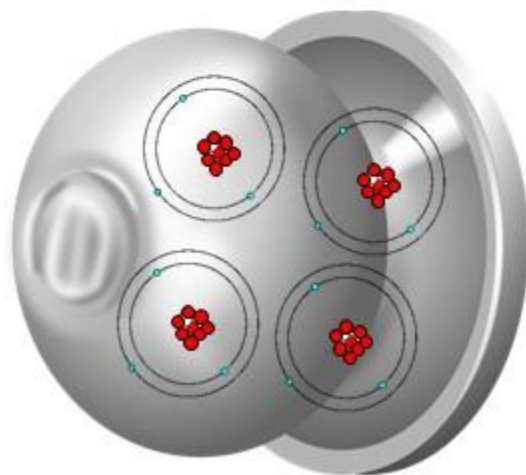
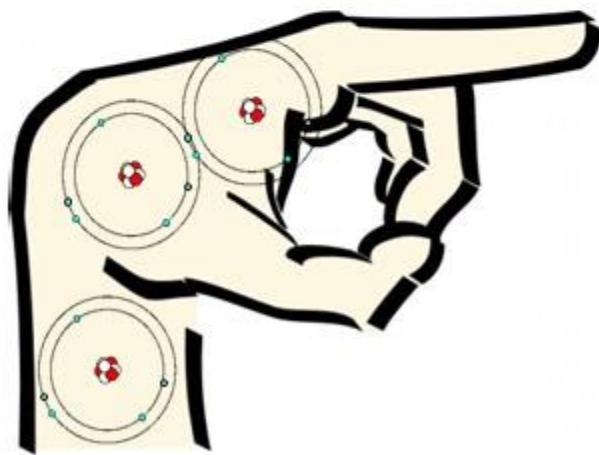
# Static Electricity

- Static Electricity – the buildup of electric charge on an object.
  - This is when an object has too many protons or too many electrons.



# Static Electricity

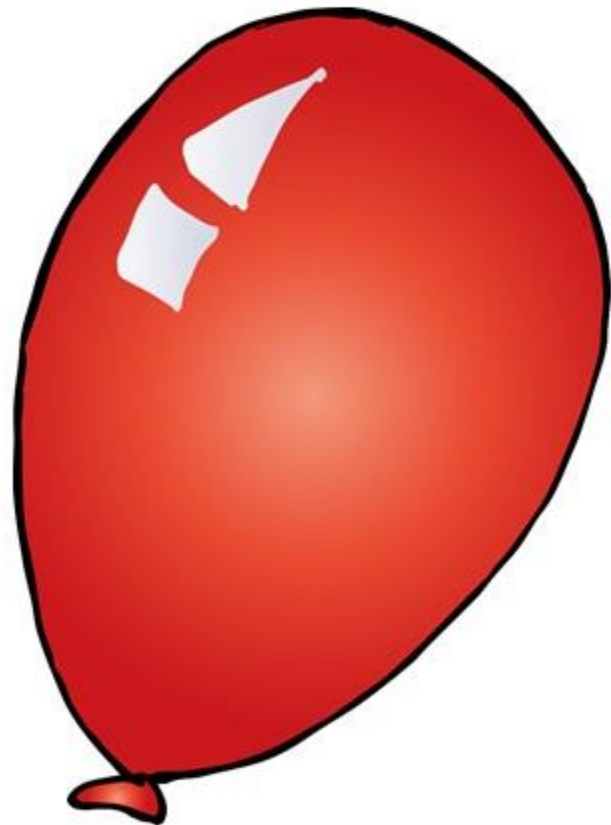
- Static Electricity does not flow through wires.
  - Static means “not moving.”
  - If the charge is strong enough, it “jumps” from one object to another.
    - This causes the “shock” that you feel.





# Charging an Object

- When two objects rub against each other (friction), electrons move or jump from one object to the other.
  - The objects that gain electrons will now have a negative charge.
  - The other object will have a positive charge.



# Walking Across a Carpet

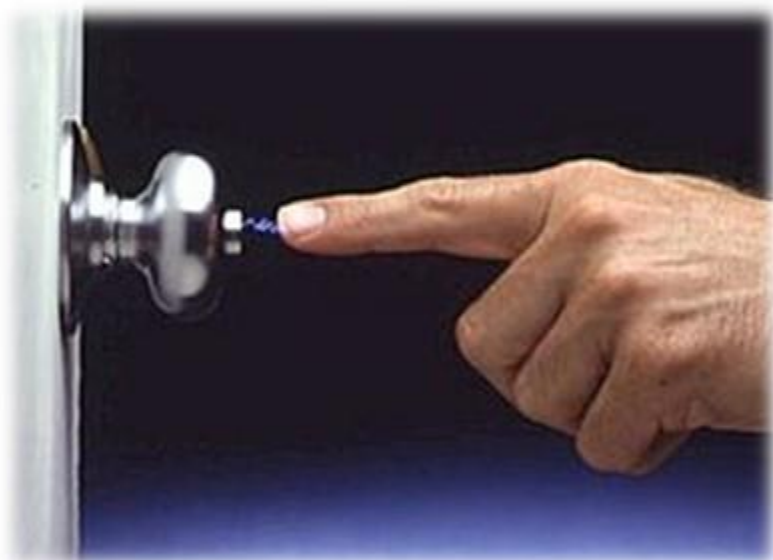
If you walk across a carpet on a dry day, your body will gain a negative charge because electrons are moving from the carpet to your socks.

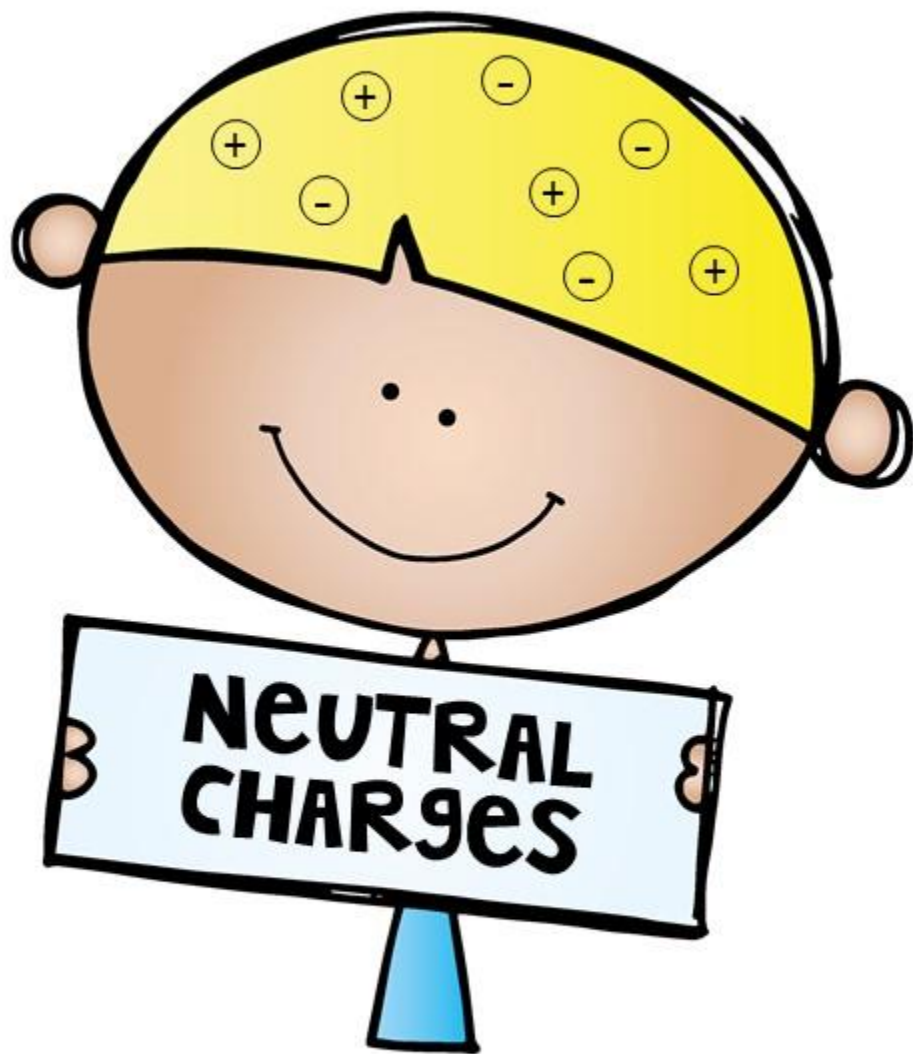
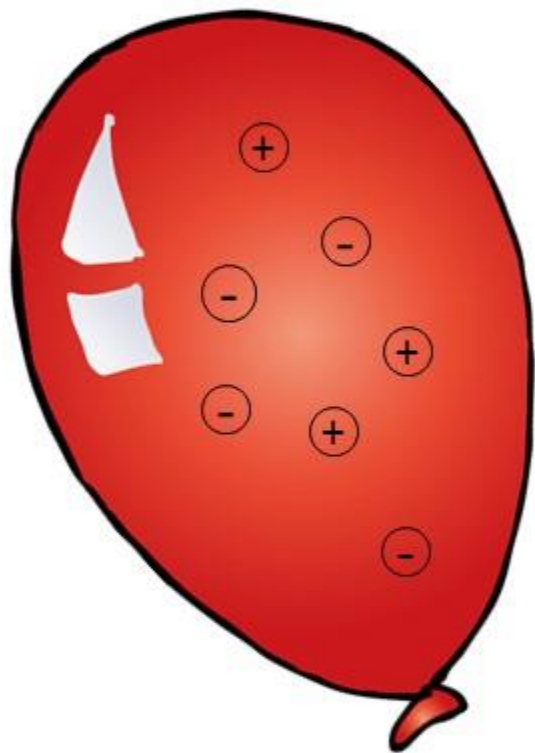




# Walking Across a Carpet

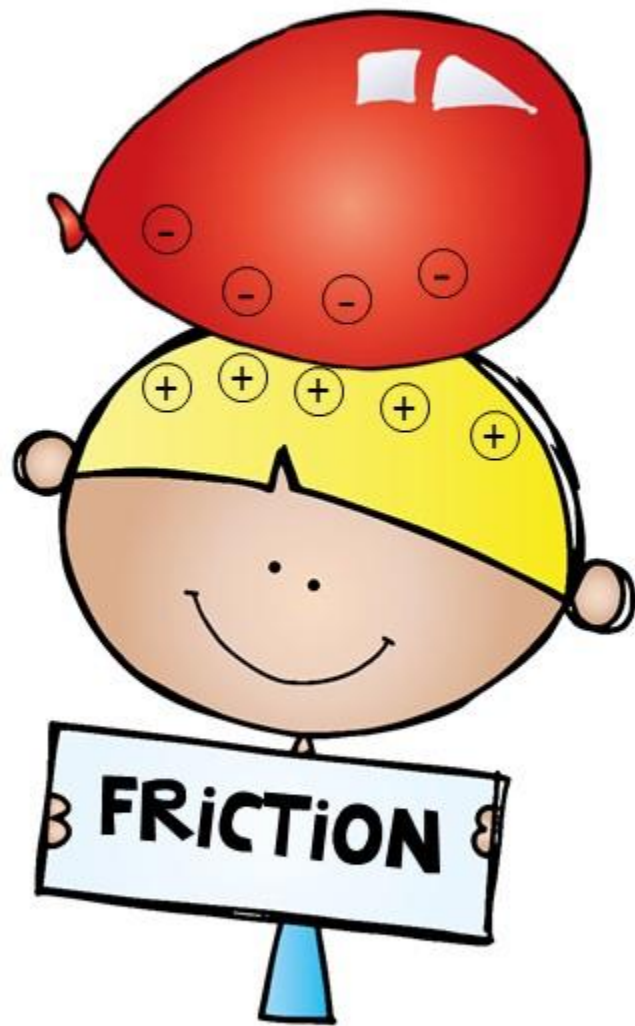
- Your hand (negative charge) will now attract to the protons on a metal doorknob
  - Electrons will jump from your hand to the doorknob and you will feel a shock
  - This is called *electric discharge*: when electrons move quickly from one object to another
  - You now have a neutral charge again





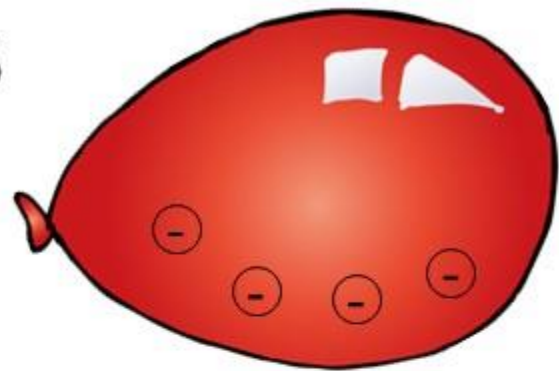
# Balloons

- Balloon:
  - Rub a balloon on your hair
    - Negative electrons move from your hair to the balloon



# Balloons

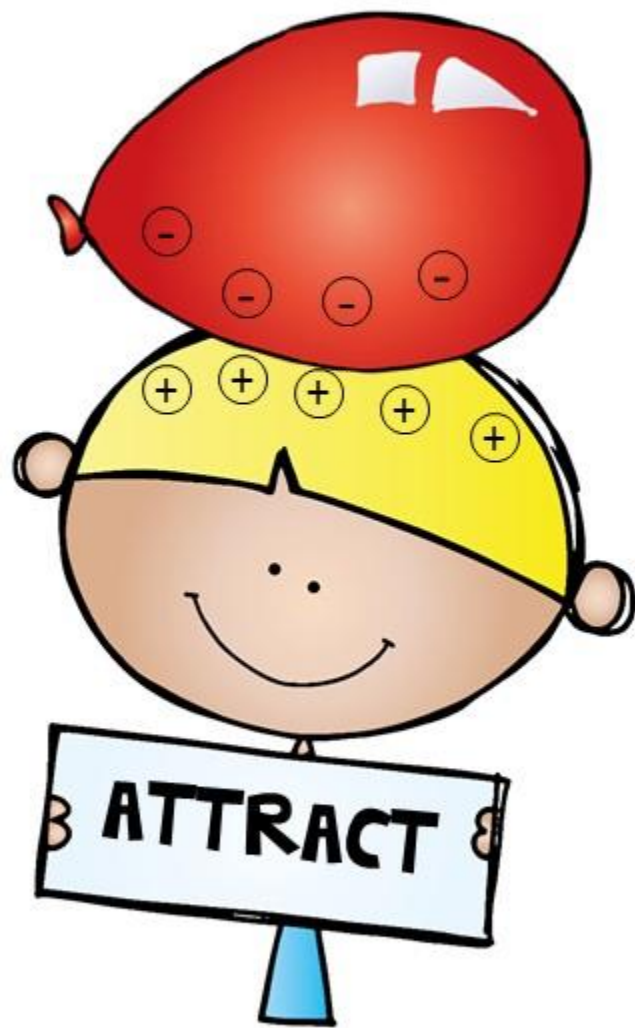
- Balloon:
  - The balloon now has a **NEGATIVE** charge, and your hair has a **POSITIVE** charge





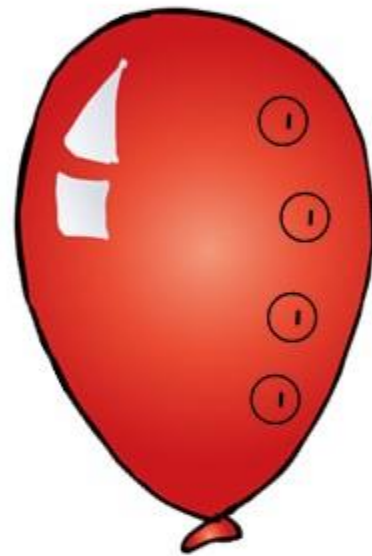
# Balloons

- Balloon:
  - Since opposite charges attract, the balloon now sticks to your hair.



# Balloons

- Bring the balloon near a wall – it will push away electrons (like charges repel)
  - The wall will now have a positive charge
- The balloon sticks to the wall because it has an opposite charge





# Lightning

- Lightning is an example of electric discharge
  - The bottom of the cloud gains a negative charge
    - This creates a positive charge on the ground
    - When the charge is strong enough, the charge jumps from the cloud to the ground (lightning).



# Static Electricity



- When you go down a slide, your hair gives off electrons leaving behind a positive charge
  - Your hair sticks straight up because the positive charges do not want to touch each other.