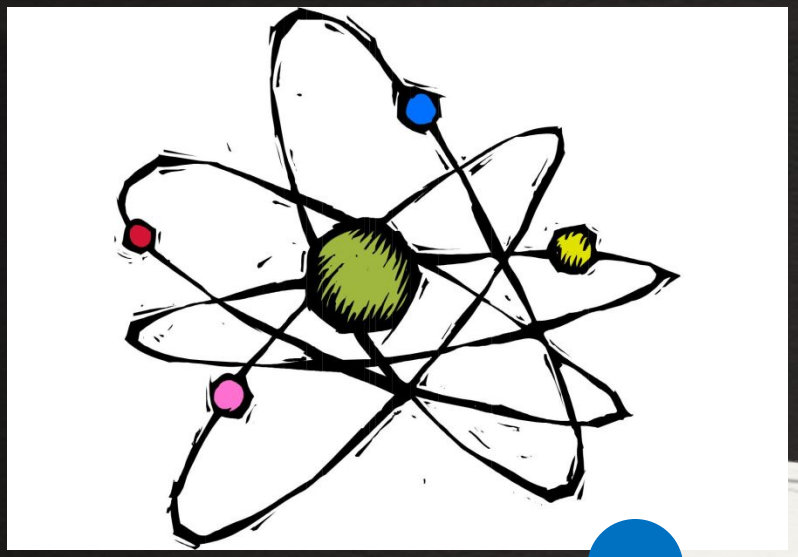
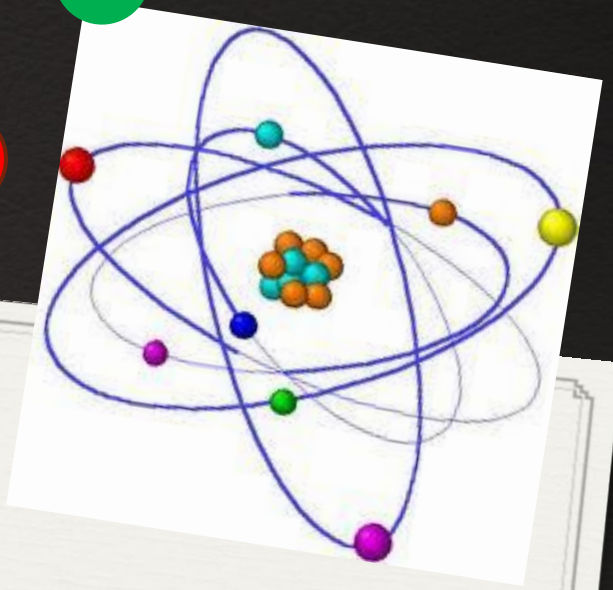




Atomic Structure

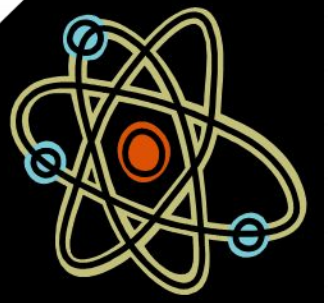
Essential Questions: How do the subatomic particles of an atom help identify each element. How can we predict the behavior of an atom based on its unique properties?

Objectives

- Students will explain that atoms are the smallest unit of an element and are composed of subatomic particles.

Atoms

- Matter is anything that takes up space and has mass. All matter is made of atoms.
- Atoms are the basic building blocks of matter. They make up everything around us; Your desk, the board, your body, everything is made of atoms!
- Atoms are too small to see without powerful microscopes.

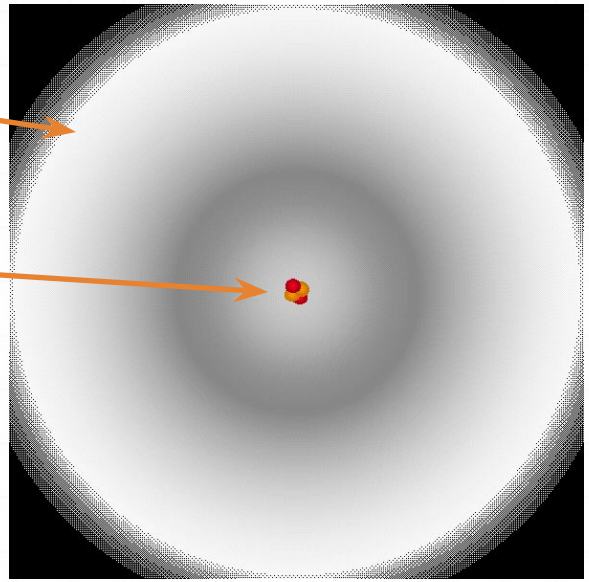


Atomic Structure

There are two basic components in every atom:

Electron Cloud

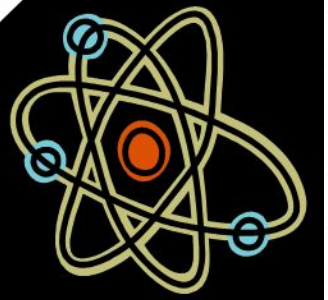
Nucleus



Subatomic Particles

Three subatomic particles make up every atom:

Subatomic Particle	Charge	Location
Proton	Positive (+)	Nucleus or “Core”
Neutron	No Charge (0)	Nucleus or “Core”
Electron	Negative (-)	Electron Cloud



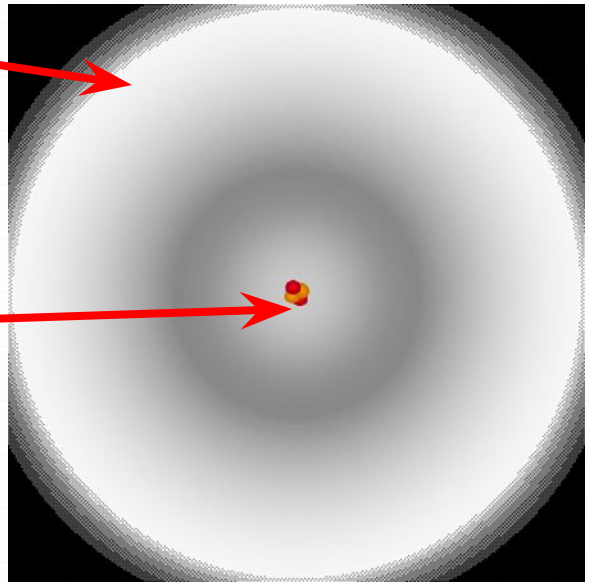
Subatomic Particles

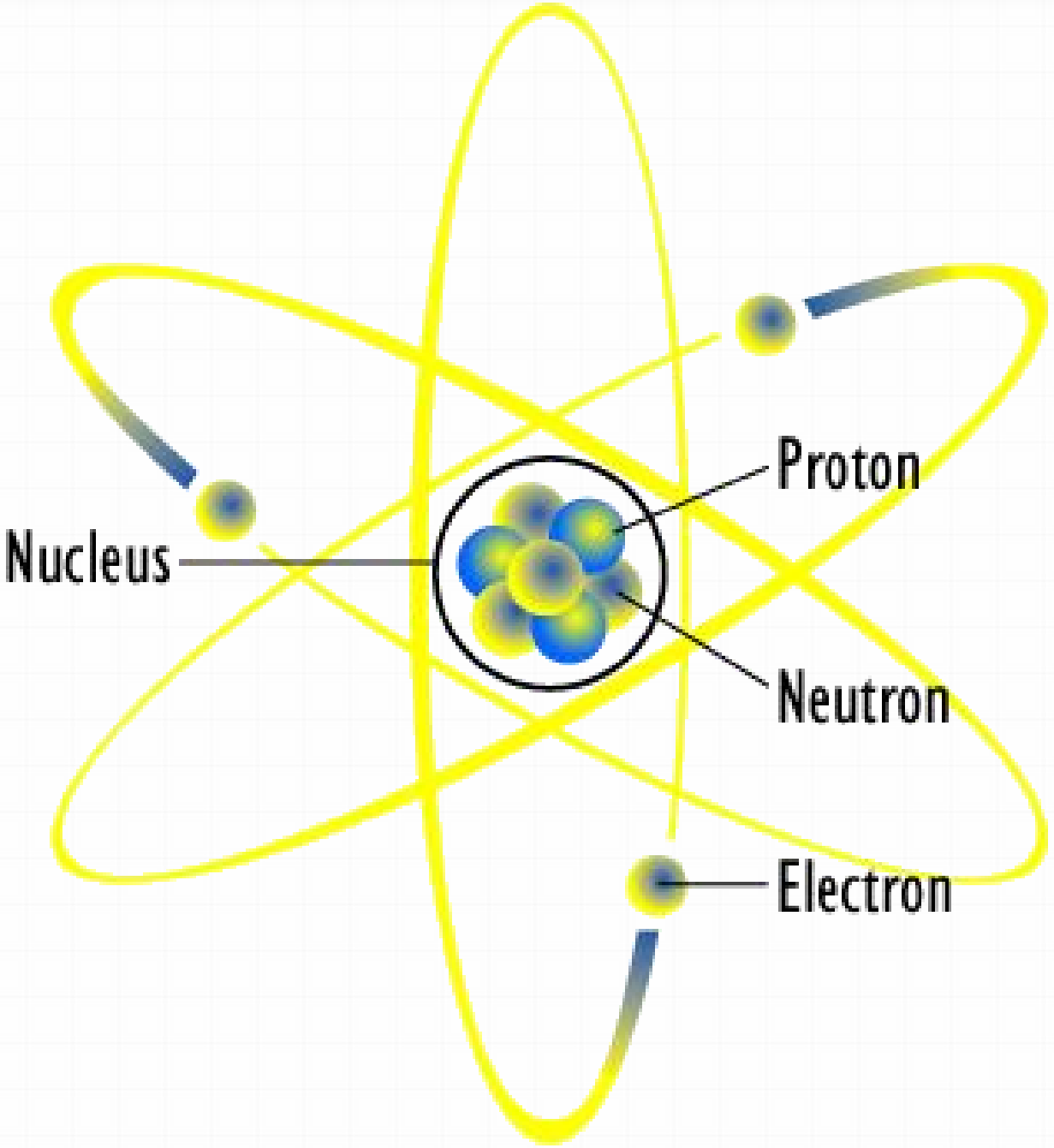
Electron Cloud:

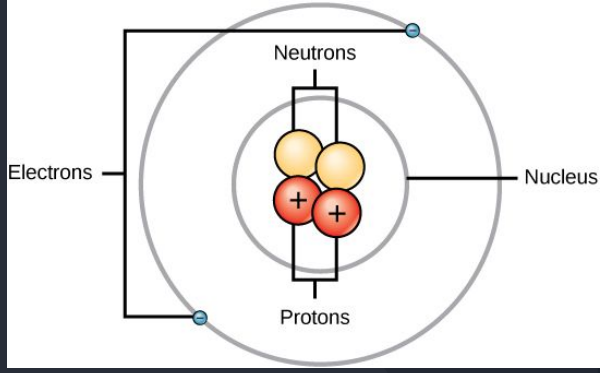
- Electrons orbit the nucleus.

Nucleus or "Core":

- Protons and Neutrons are found in the nucleus.




Proton
Nucleus
Neutron
Electron

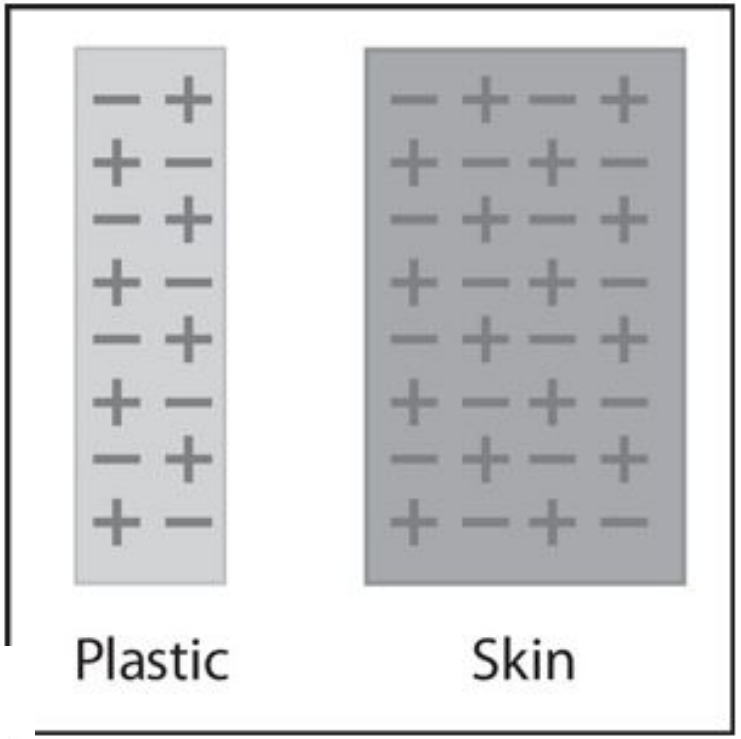


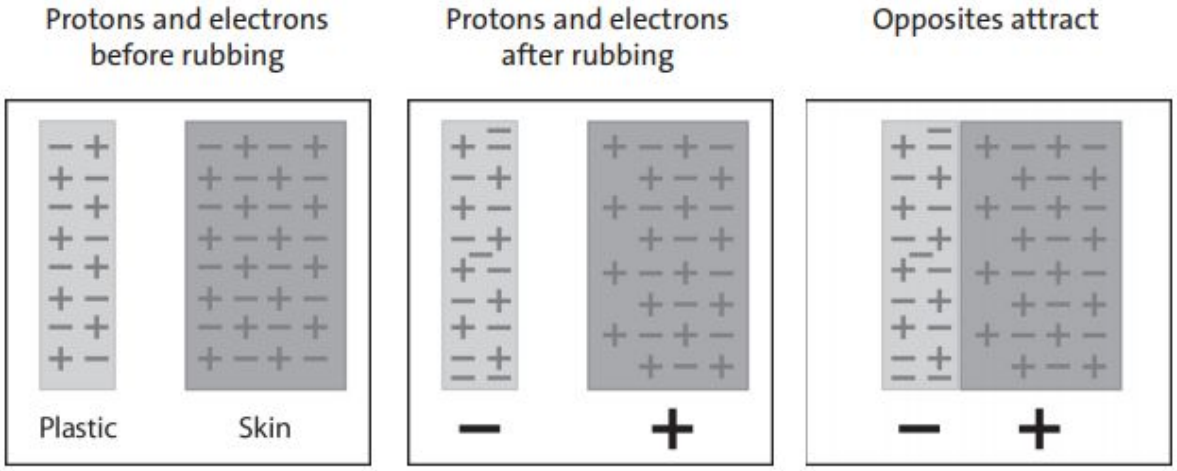
- **protons and electrons have opposite charges and attract each other**

http://www.middleschoolchemistry.com/multimedia/chapter4/lesson1#protons_and_electrons

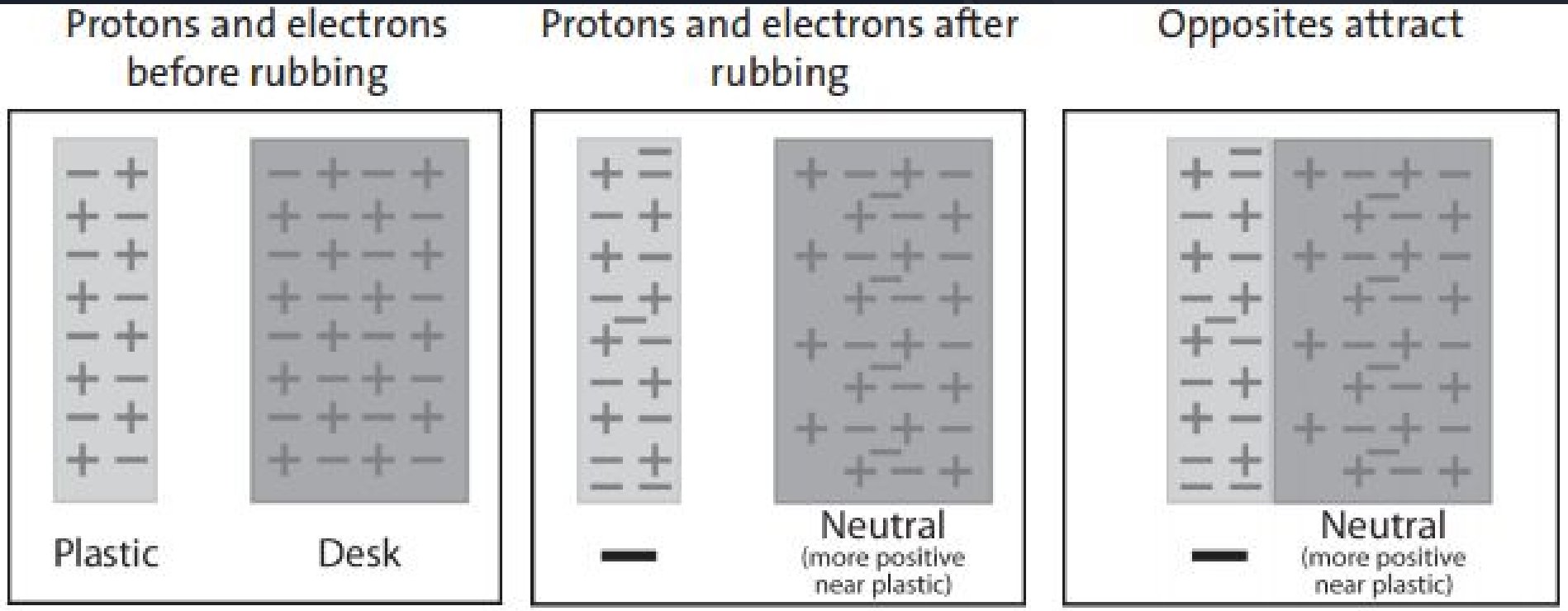
Charged Plastic and Hand

- When the plastic strip is rubbed on the skin, electrons from the skin are transferred to the plastic giving the plastic a negative charge.
- When the plastic is moved near the desk, electrons in the desk are repelled by the negatively charged plastic.
- This leaves an area of positive charge in the desk near the plastic.
- The negative plastic and the positive area of the desk attract.



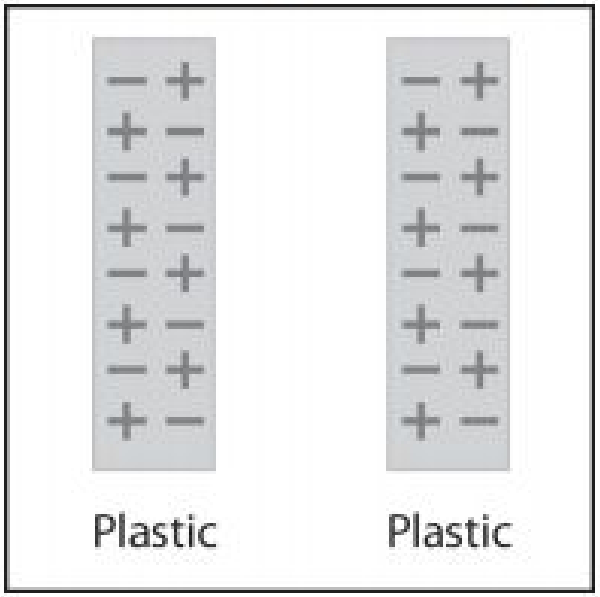


Plastic Bag Near a Desk or Chair

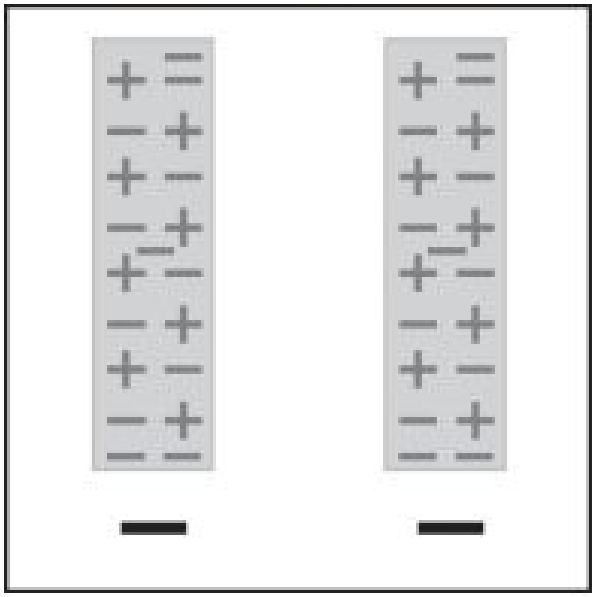


2 Pieces of Plastic
What did you notice and Why?

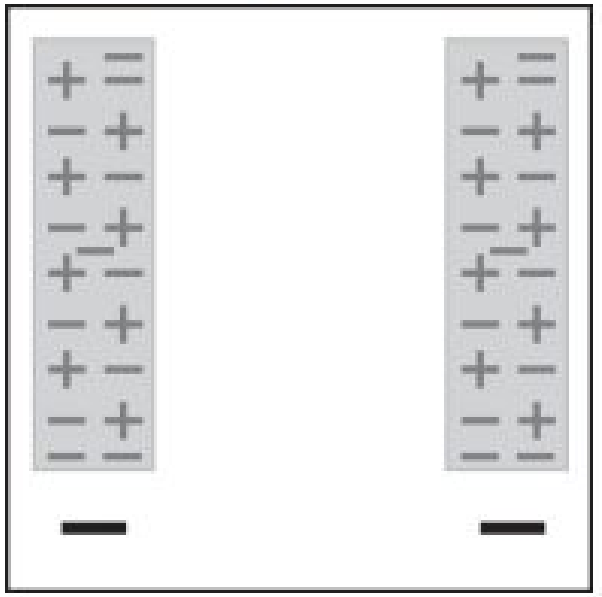
Two neutral plastic strips



Two charged plastic strips



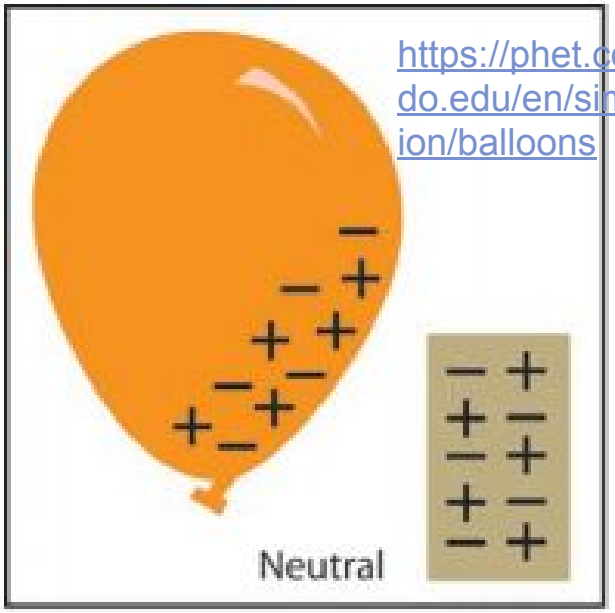
Like charges repel

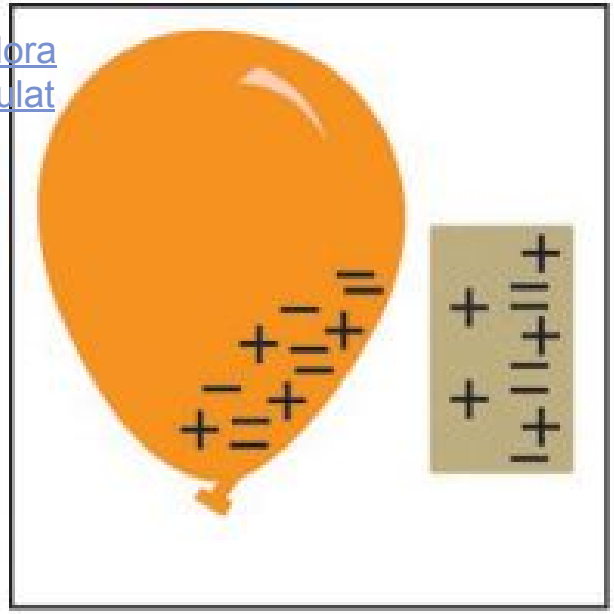


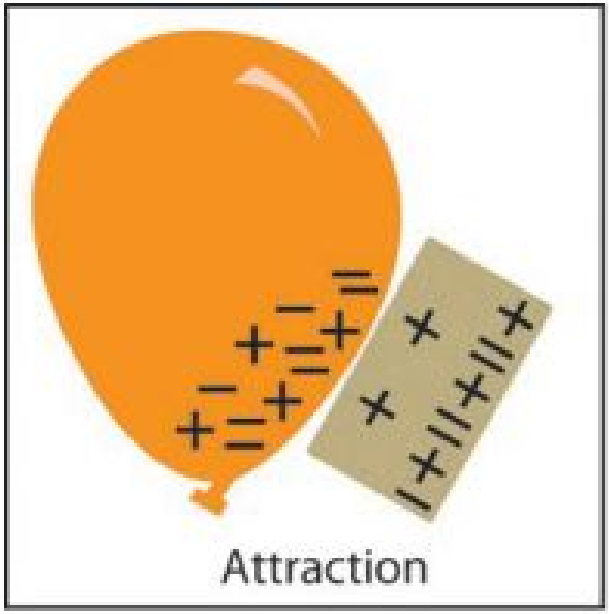
What did you observe when the charged balloon was held near the pieces of paper?

Use what you know about electrons, protons, and charges to explain why this happens.

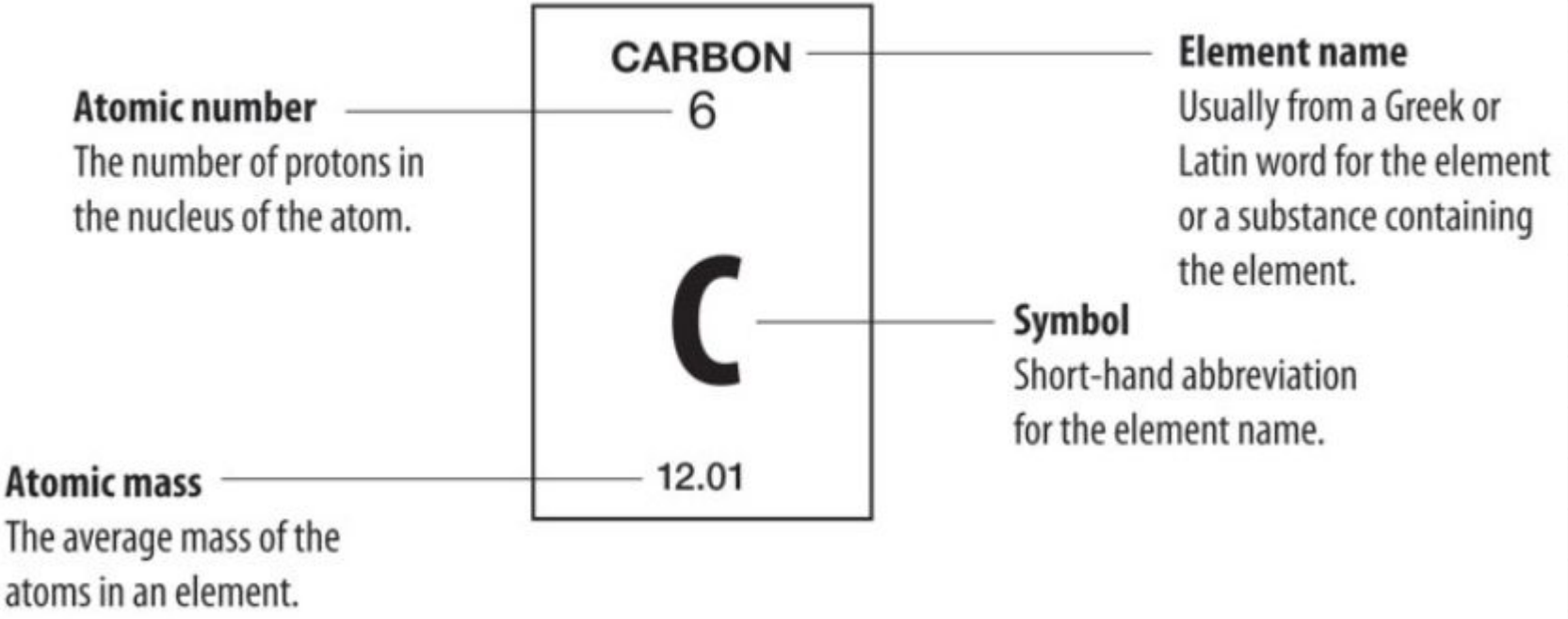
https://phet.colorado.edu/en/simulation/balloons







Intro 2 Elements



Atomic Structure Review

Proton

- +
- atomic number = protons

Electron

- -
- E = P

Neutron

- Neutral
- Mass - Protons = neutrons (bottom #- top #)