**Bell Ringer #9:**

Socrative Room Name:
LEVEL70WARRIOR

# Atomic Structure

## New Seating Chart

http://drmoad.weebly.com/

# Agenda

Bell Ringer
New Seating Chart
Atomic Structure Notes
Turn In Lab, HW, & Notes
*** Unit 1 Test ***
Exit Ticket

## Early Models of the Atom

- An atom is the smallest particle of an element that retains its identity in a chemical reaction.
- Although early philosophers and scientists could not observe individual atoms, they were still able to propose ideas about the structure of atoms.

## Sizing up the Atom:

**Atoms are very small.**

- A pure copper coin the size of a penny contains $2.4 \times 10^{22}$ atoms.
- By comparison, Earth's population is only about $7 \times 10^{9}$ people.
- If you could line up 100,000,000 copper atoms side by side, they would produce a line only 1 cm long!

## Subatomic Particles:

- Three kinds of subatomic particles are electrons, protons, and neutrons.

## Subatomic Particles:

## Electrons

- In 1897, the English physicist J. J. Thomson (1856-1940) discovered the electron.
- Electrons are negatively charged subatomic particles.

## Subatomic Particles:

### Protons

- Positively charged subatomic particles are called protons
- Determines the identity of the atom
- Number of protons is represented on the periodic table as the atomic number

## Subatomic Particles:

## Neutrons

- In 1932, the English physicist James Chadwick (1891-1974) confirmed the existence of yet another subatomic particle: the neutron.
- Neutrons are subatomic particles with no charge, but with a mass nearly equal to that of a proton.

## Properties of Subatomic Particles:

The table below summarizes the properties of these subatomic particles.

| Properties of Subatomic Particles | | | | |
|---|---|---|---|---|
| **Particle** | **Symbol** | **Relative charge** | **Relative mass (mass of proton = 1)** | **Actual mass (g)** |
| Electron | $e^-$ | 1– | 1/1840 | $9.11 \times 10^{-28}$ |
| Proton | $p^+$ | 1+ | 1 | $1.67 \times 10^{-24}$ |
| Neutron | $n^0$ | 0 | 1 | $1.67 \times 10^{-24}$ |

## Atomic Number:

**Remember that atoms are electronically neutral**

- **Thus, the number of electrons (negatively charged particles) must equal the number of protons (positively charged particles)**

**Mass Number:**

**The total number of protons and neutrons in an atom is called the mass number.**

**For each element listed in the table below, the number of protons equals the number of electrons.**

| Atoms of the First Ten Elements | | | | | | |
|---|---|---|---|---|---|---|
| **Name** | **Symbol** | **Atomic number** | **Protons** | **Neutrons** | **Mass number** | **Electrons** |
| Hydrogen | H | 1 | 1 | 0 | 1 | 1 |
| Helium | He | 2 | 2 | 2 | 4 | 2 |
| Lithium | Li | 3 | 3 | 4 | 7 | 3 |
| Beryllium | Be | 4 | 4 | 5 | 9 | 4 |
| Boron | B | 5 | 5 | 6 | 11 | 5 |
| Carbon | C | 6 | 6 | 6 | 12 | 6 |
| Nitrogen | N | 7 | 7 | 7 | 14 | 7 |
| Oxygen | O | 8 | 8 | 8 | 16 | 8 |
| Fluorine | F | 9 | 9 | 10 | 19 | 9 |
| Neon | Ne | 10 | 10 | 10 | 20 | 10 |

# Exit Ticket #4:

**Socrative Room Name:**
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## Atomic Structure