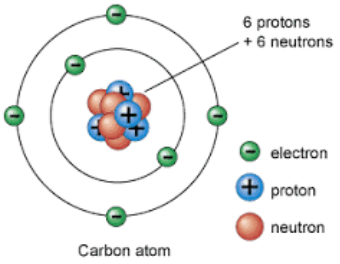
**Science 8**

# Subatomic Particles

Name:
Date:
Block:

In an atom, there are three subatomic particles.

1. protons
2. electrons
3. neutrons




**The proton:**

- This is found in the nucleus.
- It has a charge of +1.
- Its mass is 1 amu.
- The atomic # represents the number of protons.

**Practice!** Find the number of protons for the following elements!

1. Sodium: 11
2. Neon: 10
3. Einsteinium: 99
4. Chlorine 17
5. Tin: 50
6. Platinum 78
7. Tungsten: 74
8. Copper: 29
9. Gold: 79

**The electron:**

- This is found in the surrounding the nucleus
- It has a charge of -1. In a neutral atom, the overall charge is 0.
- Example: If an atom has 17 protons, it must have 17 electrons.
- Its mass is 0. → well not really but it's so small we will go with it!

**Practice!** Find the number of electrons for the following elements!

1. Silver: 47
2. Palladium: 46
3. Gallium: 31
4. Fluorine 9
5. Cesium: 55
6. Krypton 36
7. Lead: 82
8. Actinium: 89
9. Vanadium: 23

**The neutron:**

- This is found in the nucleus.
- It has a charge of 0.
- Its mass is 1 amu.
- The mass # represents the number of protons and neutrons
- Example.
  - Neon has a mass number of 20 and an atomic number of 10. Therefore the number of neutrons is 10. mass # = #p + #n

**Practice!** Find the number of neutrons for the following elements!

1. Manganese: 55-25 = 30
2. Bismuth: 209-83 = 126
3. Osmium: 190-76 = 114
4. Potassium 39-19 = 20
5. Sulfur: 32-16 = 16
6. Arsenic 75-33 = 42
7. Zinc: 65-30 = 35
8. Scandium: 45-21 = 24
9. Helium: 4-2 = 2

Fill in the following table:

| Element Name | Element Symbol | Atomic Number | Mass Number | # of Protons | # of Neutrons | # of Electrons |
|---|---|---|---|---|---|---|
| 1. Chlorine | Cl | 17 | 35 | 17 | 18 | 17 |
| 2. Silver | Ag | 47 | 108 | 47 | 61 | 47 |
| 3. Oxygen | O | 8 | 16 | 8 | 8 | 8 |
| 4. Aluminum | Al | 13 | 27 | 13 | 14 | 13 |
| 5. Cesium | Cs | 55 | 133 | 55 | 78 | 55 |
| 6. Palladium | Pd | 46 | 106 | 46 | 60 | 46 |
| 7. Ruthenium | Ru | 44 | 101 | 44 | 57 | 44 |
| 8. Tungsten | W | 74 | 184 | 74 | 110 | 74 |
| 9. Europium | Eu | 63 | 152 | 63 | 90 | 63 |
| 10. Protactinium | Pa | 91 | 231 | 91 | 140 | 91 |

# The Periodic Table

**Dmitri Mendeleev**: *the dude who invented the table*

- His first periodic table was published in 1869
- Listed the elements in order of increasing atomic mass
- Mendeleev included gaps and predicted the properties of missing elements

Major divisions within Periodic Table

- Period: a row across the table
- Group/Family: a column down the table

**Alkali Metals**

- Group 1
- most reactive of a metals
- similar reativity/properties
- List all alkali metals from your Periodic Table: H, Li, Na, K, Rb, Cs, Fr

**Alkaline Earth**

- Group 2
- All shiny, silvery-white, some what reactive metals
- List all alkaline earth metals from your Periodic Table: Be, Mg, Ca, Sr, Ba, Ra

**Transition Metals**

- Group 3 to 12

**Halogens**

- Group 17
- all gases!
- List all halogens from your Periodic Table: F, Cl, Br, I, At

**Noble Gases**

- Group 18
- Typically unreactive (inert) gases
- List all noble gases from your Periodic Table: He, Ne, Ar, kr, Xe, Rn