

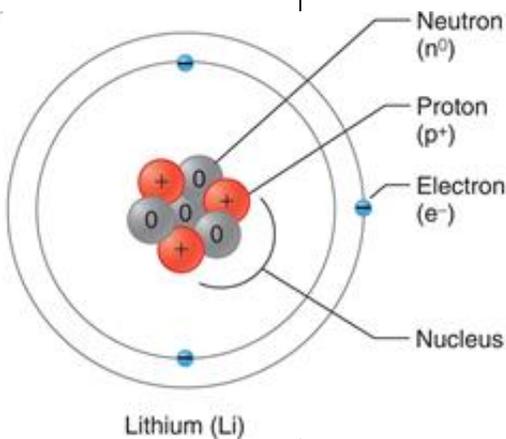
Describe the structure of an atom.  
Be able to identify the number of protons, neutrons, and electrons in an atom.

Identify the subatomic particles and their charges?

Where are the subatomic particles located in an atom?

**Structure of an atom:**

- Atoms are made of smaller particles called subatomic particles:
  - Protons (positive)
  - Neutrons (neutral)
  - Electrons (negative)
- Protons and neutrons are located in the nucleus (the center of the atom).
- Electrons are orbiting the nucleus.
- The particles of opposite charges are attracted to each other, keeping electrons near the nucleus
- The # of electrons = # of protons



Structure of an Atom			
Subatomic Particle	Location	Charge	Mass
Proton	Nucleus of the atom	Positive	1 amu
Neutron	Nucleus of the atom	Neutral	1 amu
Electron	VERY quickly orbiting the nucleus	Negative	Basically no mass

What does the atomic number of an atom represent?

How do the atomic numbers compare between different atoms?

If an atom has 12 protons, how many electrons does it have?

Where do you find the atomic mass of an element on the periodic table?

How do you get the atomic number from this value?

How do you calculate the mass of an atom?

What does the atomic mass of an atom represent?

KEY		
Atomic Mass →	12.011	-4 ← Selected Oxidation States
Symbol →	<b>C</b>	+2
Atomic Number →	<b>6</b>	+4
Electron Configuration →	2-4	

Relative atomic masses are based on  $^{12}\text{C} = 12.000$

**Note:** Mass numbers in parentheses are mass numbers of the most stable or common isotope.

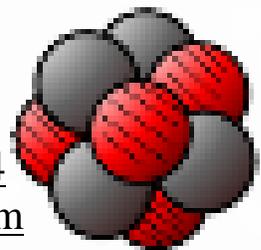
## Atomic Number:

- Number of protons in an atom
- Each atom has a different number of protons
- In atoms the number of protons always equals the number of electrons (making the atom neutral)

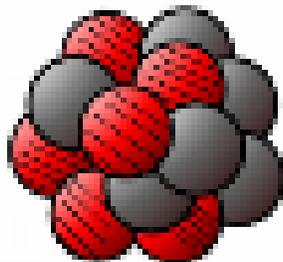
Below are the nuclei of 3 atoms. Which atoms are shown?



2 Protons = Atomic Number 2  
Helium



4 Protons = Atomic Number 4  
Beryllium



6 Protons = Atomic Number 6  
Carbon

## Mass Number

- Mass Number for an atom = number of protons PLUS neutrons
- For the Mass of a single atom, round the atomic mass on the periodic table to the nearest whole number

## Finding the Number of Neutrons

- To Calculate:

$$\frac{\text{Atomic mass (protons + neutrons)} - \text{Atomic number (protons only)}}{\text{Number of neutrons in one atom}}$$

How do you determine the number of neutrons an atom possesses?

Find the following for the aluminum atom:

Atomic number

Atomic mass

Number of neutrons  
Number of protons

Number of electrons

Diagram of the periodic table entry for Carbon (C):

- Atomic Mass: 12.011
- Symbol: C
- Atomic Number: 6
- Electron Configuration: 2-4
- Selected Oxidation States: -4, +2, +4

### Practice:

- Atomic number of carbon \_\_\_\_\_
- Atomic mass of carbon \_\_\_\_\_
- Mass number for a Carbon atom \_\_\_\_\_
- Number of neutrons in a carbon atom \_\_\_\_\_
- Number of protons in a carbon atom \_\_\_\_\_
- Number of electrons in a carbon atom \_\_\_\_\_

- Atomic number of Molybdenum \_\_\_\_\_
- Atomic mass of Molybdenum \_\_\_\_\_
- Mass number for a Molybdenum atom \_\_\_\_\_
- Number of neutrons in a Molybdenum atom \_\_\_\_\_
- Number of protons in a Molybdenum atom \_\_\_\_\_
- Number of electrons in a Molybdenum atom \_\_\_\_\_

Diagram of the periodic table entry for Molybdenum (Mo):

- Atomic Mass: 95.94
- Symbol: Mo
- Atomic Number: 42