

# ATOMIC STRUCTURE

Name \_\_\_\_\_

An atom is made up of protons and neutrons (both found in the nucleus) and electrons (in the surrounding electron cloud). The atomic number is equal to the number of protons. The mass number is equal to the number of protons plus neutrons. In a neutral atom, the number of protons equals the number of electrons. The charge on an ion indicates an imbalance between protons and electrons. Too many electrons produces a negative charge, too few, a positive charge.

This structure can be written as part of a chemical symbol.

**Example:**

mass  
number  
↓

$^{15}\text{N}$

↑

atomic  
number

7 protons

8 neutrons (15 - 7)

7 electrons

Complete the following chart.

Element/ Ion	Atomic Number	Atomic Mass (FROM PERIODIC TABLE)	Mass Number	Protons	Neutrons	Electrons
$^1_1\text{H}$						
$^2_1\text{H}$						
$^{12}_6\text{C}$						
$^7_3\text{Li}$						
$^{35}_{17}\text{Cl}$						
$^{39}_{19}\text{K}$						
$^{24}_{12}\text{Mg}$						
$^{75}_{33}\text{As}$						
$^{108}_{47}\text{Ag}$						
$^{106}_{47}\text{Ag}$						
$^{32}_{16}\text{S}$						
$^{238}_{92}\text{U}$						

Name \_\_\_\_\_ Period \_\_\_\_\_ Date \_\_\_\_\_

## Atomic Structure

### PART A – SUBATOMIC PARTICLES

The table below contains information about several elements. In each case, enough information has been provided for you to fill in the blanks. Assume all atoms are neutral.

Isotope Name	Nuclear Symbol	Atomic Number	Mass Number	# of Protons	# of Electrons	# of Neutrons
1. calcium-40						
2.		12	24			
3.				2		2
4.	$^{197}_{79}\text{Au}$					
5.					26	30
6.			201	80		
7.		17				18
8.		19	40			
9. silver-108						
10.	$^{119}_{50}\text{Sn}$					
11.		1			1	2
12.		36	84			

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Name KEY

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**Example:**

mass  
number  
↓

$^{15}\text{N}$

↑

atomic  
number

7 protons

8 neutrons (15 - 7)

7 electrons

Complete the following chart. *WEIGHTED AVERAGE OF ALL ISOTOPES*

Element/ Ion	Atomic Number	Atomic Mass (FROM PERIODIC TABLE)	Mass Number	Protons	Neutrons	Electrons
$^1_1\text{H}$	1	1.00794 AMU	1	1	0	1
$^2_1\text{H}$	1	1.00794 AMU	2	1	1	1
$^{12}_6\text{C}$	6	12.0107 AMU	12	6	6	6
$^7_3\text{Li}$	3	6.941 AMU	7	3	4	3
$^{35}_{17}\text{Cl}$	17	35.453 AMU	35	17	18	17
$^{39}_{19}\text{K}$	19	39.0983 AMU	39	19	20	19
$^{24}_{12}\text{Mg}$	12	24.3050 AMU	24	12	12	12
$^{75}_{33}\text{As}$	33	74.92160 AMU	75	33	42	33
$^{108}_{47}\text{Ag}$	47	107.8682 AMU	108	47	61	47
$^{106}_{47}\text{Ag}$	47	107.8682 AMU	106	47	59	47
$^{32}_{16}\text{S}$	16	32.066 AMU	32	16	16	16
$^{238}_{92}\text{U}$	92	238.02891 AMU	238	92	146	92

Name KEY Period \_\_\_\_\_ Date \_\_\_\_\_

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Isotope Name	Nuclear Symbol	Atomic Number	Mass Number	# of Protons	# of Electrons	# of Neutrons
1. calcium-40	${}^{40}_{20}\text{Ca}$	20	40	20	20	20
2. Magnesium-40	${}^{24}_{12}\text{Mg}$	12	24	12	12	12
3. Helium-4	${}^4_2\text{He}$	2	4	2	2	2
4. Gold-197	${}^{197}_{79}\text{Au}$	79	197	79	79	118
5. Iron-56	${}^{56}_{26}\text{Fe}$	26	56	26	26	30
6. Mercury-201	${}^{201}_{80}\text{Hg}$	80	201	80	80	121
7. Chlorine-35	${}^{35}_{17}\text{Cl}$	17	35	17	17	18
8. Potassium-40	${}^{40}_{19}\text{K}$	19	40	19	19	21
9. silver-108	${}^{108}_{47}\text{Ag}$	47	108	47	47	61
10. Tin-119	${}^{119}_{50}\text{Sn}$	50	119	50	50	69
11. Hydrogen-3	${}^3_1\text{H}$	1	3	1	1	2
12. Krypton-84	${}^{84}_{36}\text{Kr}$	36	84	36	36	48