

# The Periodic Table of the Elements

Periods  
Energy Levels

Metals  
Metalloids  
Non-Metals

Element name → Mercury  
Atomic # ← 80  
Symbol → Hg  
Avg. Mass ← 200.59

Non-Metal Reactivity →

Metal Reactivity ←

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Hydrogen 1 H 1.01	Helium 2 He 4.00	Lithium 3 Li 6.94	Beryllium 4 Be 9.01									Boron 5 B 10.81	Carbon 6 C 12.01	Nitrogen 7 N 14.01	Oxygen 8 O 16.00	Fluorine 9 F 19.00	Neon 10 Ne 20.18
Sodium 11 Na 22.99	Magnesium 12 Mg 24.31									Aluminum 13 Al 26.98	Silicon 14 Si 28.09	Phosphorus 15 P 30.97	Sulfur 16 S 32.07	Chlorine 17 Cl 35.45	Argon 18 Ar 39.95		
Potassium 19 K 39.10	Calcium 20 Ca 40.08	Scandium 21 Sc 44.96	Titanium 22 Ti 47.88	Vanadium 23 V 50.94	Chromium 24 Cr 52.00	Manganese 25 Mn 54.94	Iron 26 Fe 55.85	Cobalt 27 Co 58.93	Nickel 28 Ni 58.69	Copper 29 Cu 63.55	Zinc 30 Zn 65.39	Gallium 31 Ga 69.72	Germanium 32 Ge 72.61	Arsenic 33 As 74.92	Selenium 34 Se 78.96	Bromine 35 Br 79.90	Krypton 36 Kr 83.80
Rubidium 37 Rb 85.47	Strontium 38 Sr 87.62	Yttrium 39 Y 88.91	Zirconium 40 Zr 91.22	Niobium 41 Nb 92.91	Molybdenum 42 Mo 95.94	Technetium 43 Tc (98)	Ruthenium 44 Ru 101.07	Rhodium 45 Rh 102.91	Palladium 46 Pd 106.42	Silver 47 Ag 107.87	Cadmium 48 Cd 112.41	Indium 49 In 114.82	Tin 50 Sn 118.71	Antimony 51 Sb 121.76	Tellurium 52 Te 127.60	Iodine 53 I 126.90	Xenon 54 Xe 131.29
Cesium 55 Cs 132.91	Barium 56 Ba 137.33	Lanthanum 57 La 174.97	Hafnium 72 Hf 178.49	Tantalum 73 Ta 180.95	Tungsten 74 W 183.84	Rhenium 75 Re 186.21	Osmium 76 Os 190.23	Iridium 77 Ir 192.22	Platinum 78 Pt 195.08	Gold 79 Au 196.97	Mercury 80 Hg 200.59	Thallium 81 Tl 204.38	Lead 82 Pb 207.20	Bismuth 83 Bi 208.98	Polonium 84 Po (209)	Astatine 85 At (210)	Radon 86 Rn (222)
Francium 87 Fr (223)	Radium 88 Ra (226)	Lutetium 103 Lu (262)	Rutherfordium 104 Rf (267)	Dubnium 105 Db (268)	Seaborgium 106 Sg (271)	Bhassium 107 Bh (272)	Hassium 108 Hs (270)	Mtensium 109 Mt (276)	Darmstadtium 110 Ds (281)	Roentgenium 111 Rg (280)	Copernicium 112 Cn (285)	Ununbium 113 Uub (284)	Ununquadium 114 Uuq (289)	Ununpentium 115 Uup (288)	Ununhexium 116 Uuh (293)	Ununseptium 117 Uus (294?)	Ununoctium 118 Uuo (294)

Group is **Not** Reactive - Noble Gases (outer energy shell complete with valence electrons)

Periods = Rows

Groups = Columns (also called Families)

\*lanthanides

\*\*actinides

Lanthanum 57 La 138.91	Cerium 58 Ce 140.12	Praseodymium 59 Pr 140.91	Neodymium 60 Nd 144.24	Promethium 61 Pm (145)	Samarium 62 Sm 150.36	Europium 63 Eu 151.97	Gadolinium 64 Gd 157.25	Terbium 65 Tb 158.93	Dysprosium 66 Dy 162.50	Holmium 67 Ho 164.93	Erbium 68 Er 167.26	Thulium 69 Tm 168.93	Ytterbium 70 Yb 173.04
Actinium 89 Ac (227)	Thorium 90 Th 232.04	Protactinium 91 Pa 231.04	Uranium 92 U 238.03	Neptunium 93 Np (237)	Plutonium 94 Pu (244)	Americium 95 Am (243)	Curium 96 Cm (247)	Berkelium 97 Bk (247)	Californium 98 Cf (251)	Einsteinium 99 Es (252)	Fermium 100 Fm (257)	Mendelevium 101 Md (258)	Nobelium 102 No (259)

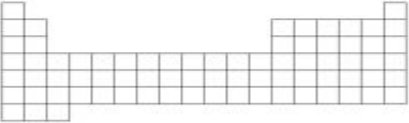

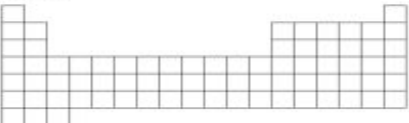
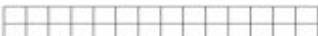
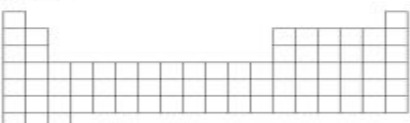
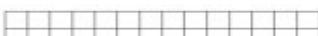
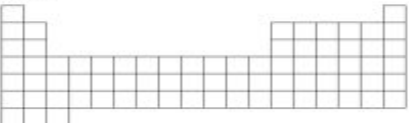

### Directions:




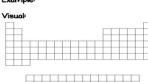
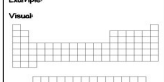
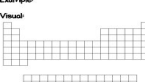
- Color the metals yellow.
- Color the metalloids green.
- Color the non-metals blue.
- Number the periods and circle each number with the correct amount of energy shells.
- Label each group with the number of valence electrons using a dot around each number.

↑ Not Reactive

# Periodic Table Handout

- You need to get some colors (either thin marker or colored pencil)
- You will need the following colors: Pink, Blue, Yellow, Purple

<p style="text-align: center;"><b><u>GROUPS VS. PERIODS</u></b></p> <p><b>Definitions:</b> Groups ( families/columns) Periods ( rows)</p> <p><b>Arranged according to:</b> Groups: Periods</p> <p><b>Visual:</b></p>  <p style="text-align: center;"></p>	<p style="text-align: center;"><b><u>REACTIVE ELEMENT</u></b></p> <p><b>Definition:</b></p> <p><b>Example:</b></p> <p><b>Visual:</b></p>	<p style="text-align: center;"><b><u>NON-REACTIVE ELEMENT</u></b></p> <p><b>Definition:</b></p> <p><b>Example:</b></p> <p><b>Visual:</b></p>
<p style="text-align: center;"><b><u>METAL (COLOR _____)</u></b></p> <p><b>Definition:</b></p> <p><b>Example:</b></p> <p><b>Visual:</b></p>  <p style="text-align: center;"></p>	<p style="text-align: center;"><b><u>NONMETAL (COLOR _____)</u></b></p> <p><b>Definition:</b></p> <p><b>Example:</b></p> <p><b>Visual:</b></p>  <p style="text-align: center;"></p>	<p style="text-align: center;"><b><u>METALLOID (COLOR _____)</u></b></p> <p><b>Definition:</b></p> <p><b>Example:</b></p> <p><b>Visual:</b></p>  <p style="text-align: center;"></p>

GROUPS VS. PERIODS	REACTIVE ELEMENT	NON-REACTIVE ELEMENT
Definition: Groups ( families/columns) Periods ( rows) Arranged according to: Groups Periods Visual: 	Definition: Example: Visual: 	Definition: Example: Visual: 
<b>METAL (COLOR _____)</b> Definition: Example: Visual: 	<b>NONMETAL (COLOR _____)</b> Definition: Example: Visual: 	<b>METALLOID (COLOR _____)</b> Definition: Example: Visual: 

# GROUPS VS. PERIODS

## Definitions:

Groups (**18** families/columns)

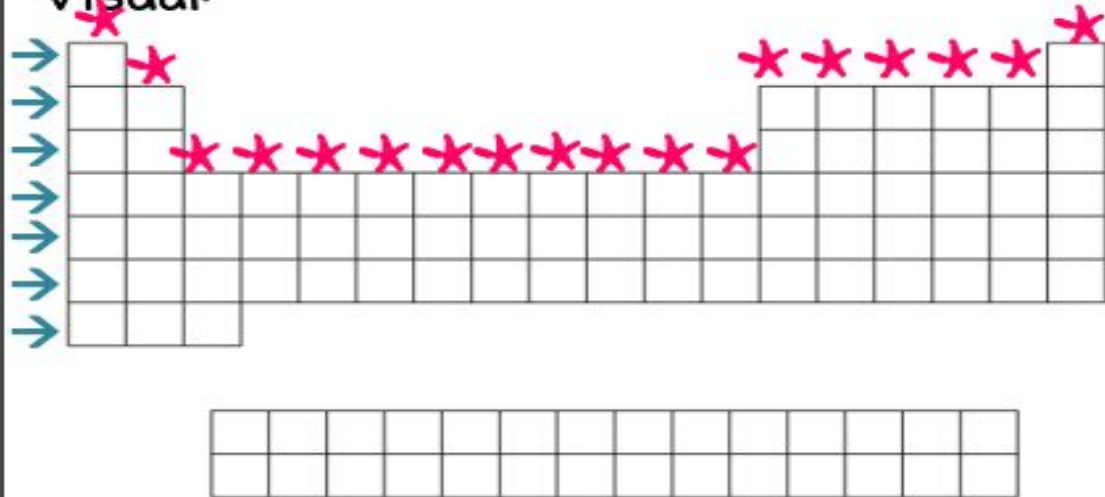
Periods (**7** rows)


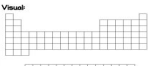
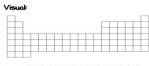
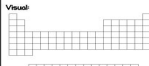
## Arranged according to:

Groups: **Elements with similar properties**

Periods **Increasing atomic number**

## Visual:



GROUPS VS. PERIODS	REACTIVE ELEMENT	NON-REACTIVE ELEMENT
Definition: Groups ( families/columns) Periods ( rows) Arranged according to Groups Periods Visual: 	Definition: Example: Visual:	Definition: Example: Visual:
METAL (COLOR ) Definition: Example: Visual: 	NONMETAL (COLOR ) Definition: Example: Visual: 	METALLOID (COLOR ) Definition: Example: Visual: 

# REACTIVE ELEMENT

Definition:







Element that easily, or readily responds (joining, repelling, forming a new substance) to other elements.

Example:

K and Na are stored separately because they're highly reactive, especially with  $O_2$ . Also,  $Na + Cl$  react to form  $NaCl$ .

Visual:



GROUPS VS. PERIODS	REACTIVE ELEMENT	NON-REACTIVE ELEMENT
Definition: Groups ( ) Periods ( ) Arranged according to Groups Periods Visual: 	Definition: Example: Visual: 	Definition: Example: Visual: 
METAL (COLOR ) Definition: Example: Visual: 	NONMETAL (COLOR ) Definition: Example: Visual: 	METALLOID (COLOR ) Definition: Example: Visual: 

# NON-REACTIVE ELEMENT

## Definition:

Element that does not respond noticeably to the presence of other elements.

## Example:

Elements in Group 18 (Noble Gas Family)

## Visual:

Group 1 Elements:  
Let's react with everyone!

H

Na

K


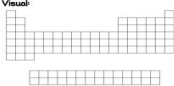

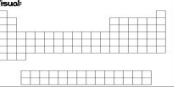
Group 18 Elements:  
Did some element say something?

Group 18 Elements:  
No thanks.  
We don't feel like it

He

Ne

Kr

GROUPS VS. PERIODS	REACTIVE ELEMENT	NON-REACTIVE ELEMENT
Definition: Groups ( families/columns) Periods ( rows) Arranged according to Groups Periods Visual: 	Definition: Example: Visual: 	Definition: Example: Visual: 
<b>METAL (COLOR )</b> Definition: Example: Visual: 	<b>NONMETAL (COLOR )</b> Definition: Example: Visual: 	<b>METALLOID (COLOR )</b> Definition: Example: Visual: 

# METAL (COLOR blue )

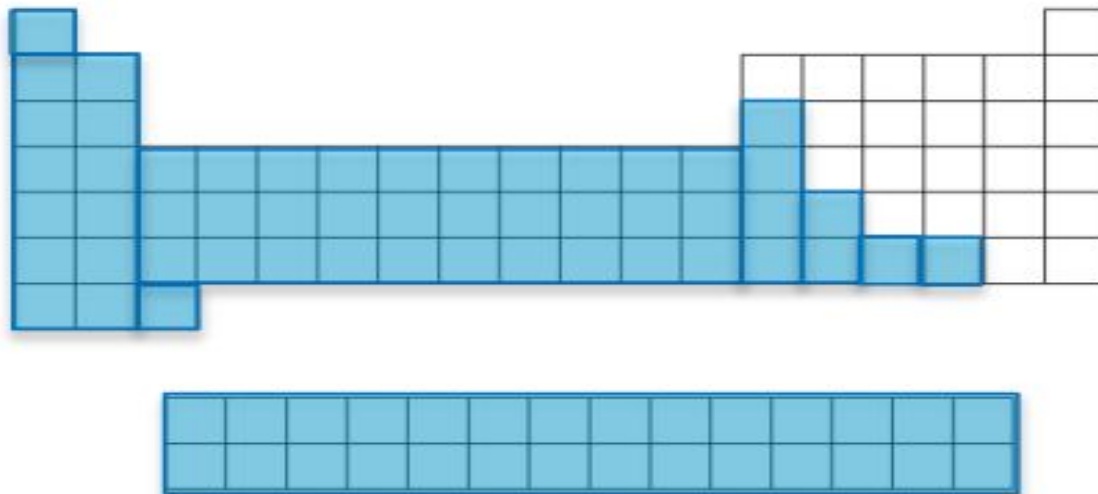
Definition:




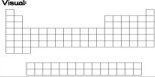
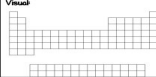
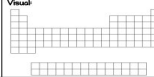
Elements that easily conduct heat and electricity. The majority of the periodic table is made of metals. Mostly found in a solid phase.

Example:

Ni (nickel), Ti (titanium), Cu (copper), etc.

Visual:



GROUPS VS. PERIODS	REACTIVE ELEMENT	NON-REACTIVE ELEMENT
Definition: Groups ( Families/columns) Periods ( rows) Arranged according to Groups Periods Visual: 	Definition: Example: Visual: 	Definition: Example: Visual: 
METAL (COLOR ) Definition: Example: Visual: 	NONMETAL (COLOR yellow) Definition: Example: Visual: 	METALLOID (COLOR ) Definition: Example: Visual: 

# NONMETAL (COLOR yellow)

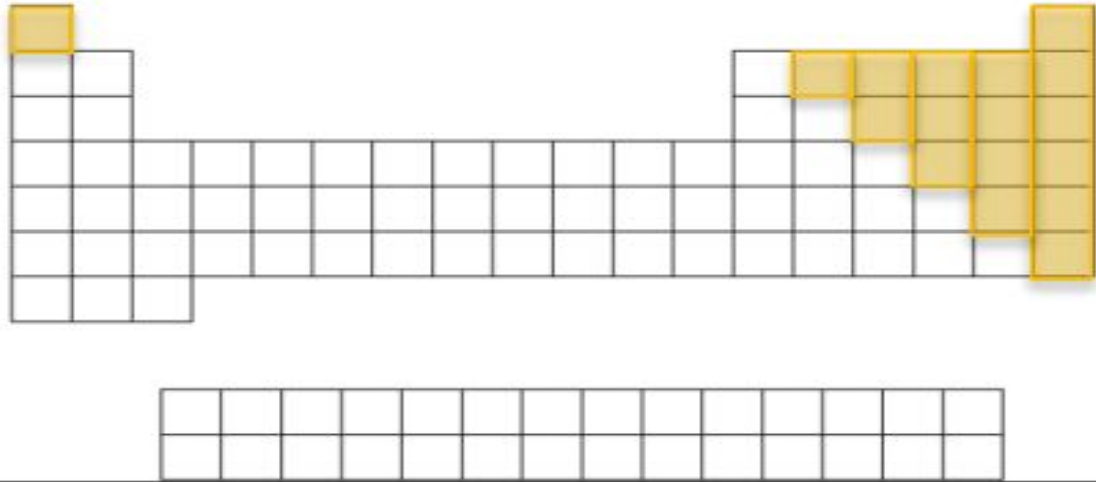
## Definition:

Elements that lack metallic properties and are poor conductors of heat and electricity. Mostly on the right side of the PTE and found in a gas phase.

## Example:

F (fluorine), O (oxygen), Cl (chlorine), etc.

## Visual:



# METALLOID (COLOR purple )

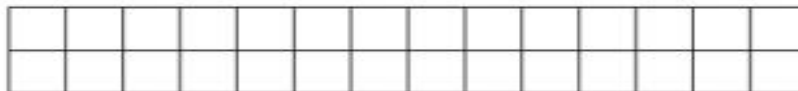
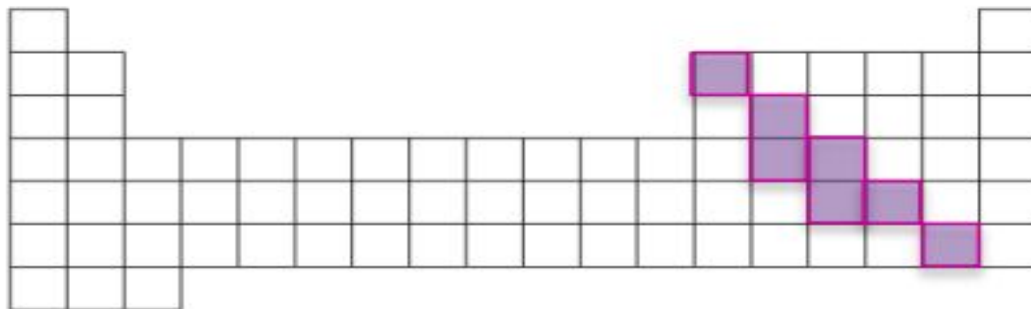
Definition:

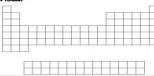
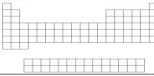
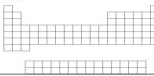
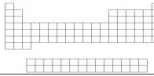
Elements look like metals but that lack true metallic properties and are poor conductors of heat and electricity. Found in the "stairs/steps" on the PTE.

Example:

As (arsenic), B (boron), Si (silicon) etc.

Visual:



GROUPS VS. PERIODS	REACTIVE ELEMENT	NON-REACTIVE ELEMENT
<p>Definition: Groups ( Families/columns) Periods ( rows) Arranged according to Groups Periods</p> <p>Visual:</p> 	<p>Definition:</p> <p>Example:</p> <p>Visual:</p>	<p>Definition:</p> <p>Example:</p> <p>Visual:</p>
<p>METAL (COLOR )</p> <p>Definition:</p> <p>Example:</p> <p>Visual:</p> 	<p>NONMETAL (COLOR )</p> <p>Definition:</p> <p>Example:</p> <p>Visual:</p> 	<p>METALLOID (COLOR )</p> <p>Definition:</p> <p>Example:</p> <p>Visual:</p> 



## GROUPS VS. PERIODS

### Definitions:

Groups (18 families/columns)

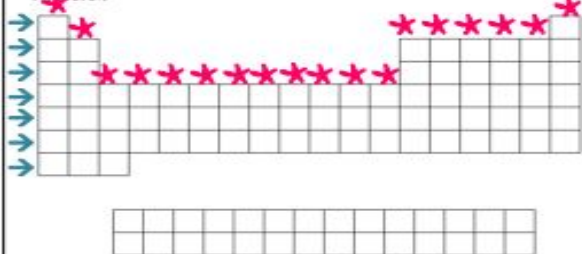
Periods (7 rows)

### Arranged according to:

Groups: Elements with similar properties

Periods: Increasing atomic number

### Visual:



## REACTIVE ELEMENT

### Definition:

Element that easily, or readily responds (joining, repelling, forming a new substance) to other elements.

### Example:

K and Na are stored separately because they're highly reactive, especially with  $O_2$ . Also, Na + Cl react to form NaCl.

### Visual:



## NON-REACTIVE ELEMENT

### Definition:

Element that does not respond noticeably to the presence of other elements.

### Example:

Elements in Group 18 (Noble Gas Family)

### Visual:



## METAL (COLOR blue)

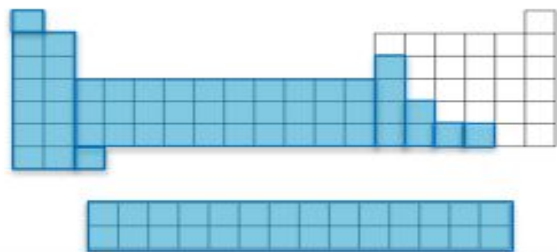
### Definition:

Elements that easily conduct heat and electricity. The majority of the periodic table is made of metals. Mostly found in a solid phase.

### Example:

Ni (nickel), Ti (titanium), Cu (copper), etc.

### Visual:



## NONMETAL (COLOR yellow)

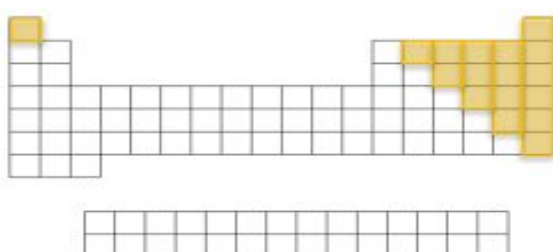
### Definition:

Elements that lack metallic properties and are poor conductors of heat and electricity. Mostly on the right side of the PTE and found in a gas phase.

### Example:

F (Fluorine), O (oxygen), Cl (chlorine), etc.

### Visual:



## METALLOID (COLOR purple)

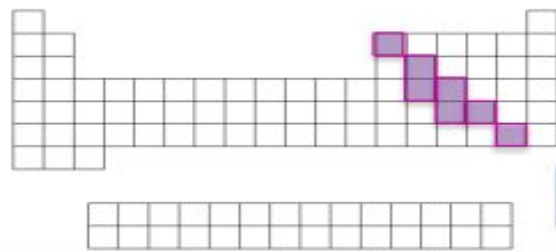
### Definition:

Elements look like metals but that lack true metallic properties and are poor conductors of heat and electricity. Found in the "stairs/steps" on the PTE.

### Example:

As (arsenic), B (boron), Si (silicon) etc.

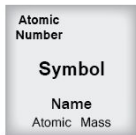
### Visual:



# How is the Periodic Table of Elements Organized?

**Periodic Table of the Elements**

1 IA 1A																	13 IIIA 3A	14 IVA 4A	15 VA 5A	16 VIA 6A	17 VIIA 7A	18 VIIIA 8A																			
1 <b>H</b> Hydrogen 1.008																	5 <b>B</b> Boron 10.811	6 <b>C</b> Carbon 12.011	7 <b>N</b> Nitrogen 14.007	8 <b>O</b> Oxygen 15.999	9 <b>F</b> Fluorine 18.998	10 <b>Ne</b> Neon 20.180																			
3 <b>Li</b> Lithium 6.941	4 <b>Be</b> Beryllium 9.012																	11 <b>Na</b> Sodium 22.990	12 <b>Mg</b> Magnesium 24.305																	13 <b>Al</b> Aluminum 26.982	14 <b>Si</b> Silicon 28.086	15 <b>P</b> Phosphorus 30.974	16 <b>S</b> Sulfur 32.066	17 <b>Cl</b> Chlorine 35.453	18 <b>Ar</b> Argon 39.948
19 <b>K</b> Potassium 39.098	20 <b>Ca</b> Calcium 40.078	21 <b>Sc</b> Scandium 44.956	22 <b>Ti</b> Titanium 47.867	23 <b>V</b> Vanadium 50.942	24 <b>Cr</b> Chromium 51.996	25 <b>Mn</b> Manganese 54.938	26 <b>Fe</b> Iron 55.845	27 <b>Co</b> Cobalt 58.933	28 <b>Ni</b> Nickel 58.693	29 <b>Cu</b> Copper 63.546	30 <b>Zn</b> Zinc 65.38	31 <b>Ga</b> Gallium 69.723	32 <b>Ge</b> Germanium 72.631	33 <b>As</b> Arsenic 74.922	34 <b>Se</b> Selenium 78.971	35 <b>Br</b> Bromine 79.904	36 <b>Kr</b> Krypton 84.798																								
37 <b>Rb</b> Rubidium 84.468	38 <b>Sr</b> Strontium 87.62	39 <b>Y</b> Yttrium 88.906	40 <b>Zr</b> Zirconium 91.224	41 <b>Nb</b> Niobium 92.906	42 <b>Mo</b> Molybdenum 95.95	43 <b>Tc</b> Technetium 98.907	44 <b>Ru</b> Ruthenium 101.07	45 <b>Rh</b> Rhodium 102.906	46 <b>Pd</b> Palladium 106.42	47 <b>Ag</b> Silver 107.868	48 <b>Cd</b> Cadmium 112.411	49 <b>In</b> Indium 114.818	50 <b>Sn</b> Tin 118.711	51 <b>Sb</b> Antimony 121.760	52 <b>Te</b> Tellurium 127.6	53 <b>I</b> Iodine 126.904	54 <b>Xe</b> Xenon 131.294																								
55 <b>Cs</b> Cesium 132.905	56 <b>Ba</b> Barium 137.328	57-71	72 <b>Hf</b> Hafnium 178.49	73 <b>Ta</b> Tantalum 180.948	74 <b>W</b> Tungsten 183.84	75 <b>Re</b> Rhenium 186.207	76 <b>Os</b> Osmium 190.23	77 <b>Ir</b> Iridium 192.217	78 <b>Pt</b> Platinum 195.085	79 <b>Au</b> Gold 196.967	80 <b>Hg</b> Mercury 200.592	81 <b>Tl</b> Thallium 204.383	82 <b>Pb</b> Lead 207.2	83 <b>Bi</b> Bismuth 208.980	84 <b>Po</b> Polonium [208.982]	85 <b>At</b> Astatine 209.987	86 <b>Rn</b> Radon 222.018																								
87 <b>Fr</b> Francium 223.020	88 <b>Ra</b> Radium 226.025	89-103	104 <b>Rf</b> Rutherfordium [261]	105 <b>Db</b> Dubnium [262]	106 <b>Sg</b> Seaborgium [266]	107 <b>Bh</b> Bohrium [264]	108 <b>Hs</b> Hassium [269]	109 <b>Mt</b> Meitnerium [268]	110 <b>Ds</b> Darmstadtium [269]	111 <b>Rg</b> Roentgenium [272]	112 <b>Cn</b> Copernicium [277]	113 <b>Uut</b> Ununtrium unknown	114 <b>Fl</b> Flerovium [289]	115 <b>Uup</b> Ununpentium unknown	116 <b>Lv</b> Livermorium [298]	117 <b>Uus</b> Ununseptium unknown	118 <b>Uuo</b> Ununoctium unknown																								



Lanthanide Series	57 <b>La</b> Lanthanum 138.905	58 <b>Ce</b> Cerium 140.116	59 <b>Pr</b> Praseodymium 140.908	60 <b>Nd</b> Neodymium 144.243	61 <b>Pm</b> Promethium 144.913	62 <b>Sm</b> Samarium 150.36	63 <b>Eu</b> Europium 151.964	64 <b>Gd</b> Gadolinium 157.25	65 <b>Tb</b> Terbium 158.925	66 <b>Dy</b> Dysprosium 162.500	67 <b>Ho</b> Holmium 164.930	68 <b>Er</b> Erbium 167.259	69 <b>Tm</b> Thulium 168.934	70 <b>Yb</b> Ytterbium 173.055	71 <b>Lu</b> Lutetium 174.967
Actinide Series	89 <b>Ac</b> Actinium 227.028	90 <b>Th</b> Thorium 232.038	91 <b>Pa</b> Protactinium 231.036	92 <b>U</b> Uranium 238.029	93 <b>Np</b> Neptunium 237.048	94 <b>Pu</b> Plutonium 244.064	95 <b>Am</b> Americium 243.061	96 <b>Cm</b> Curium 247.070	97 <b>Bk</b> Berkelium 247.070	98 <b>Cf</b> Californium 251.080	99 <b>Es</b> Einsteinium [254]	100 <b>Fm</b> Fermium 257.095	101 <b>Md</b> Mendelevium 258.1	102 <b>No</b> Nobelium 259.101	103 <b>Lr</b> Lawrencium [262]

