

# Elements

Metals - substances that are shiny, bendable and good conductors of electricity and heat.

Ex. gold

Nonmetals - are not shiny, not bendable and are not good conductors.

Solid nonmetals are brittle and lack luster.

Ex. sulfur (S)

Most nonmetals are gases

Ex. oxygen

Metalloids - elements that have properties that are similar to metals and nonmetals.

## SUMMARY

⇒ Metals and nonmetals separated by the "staircase line".

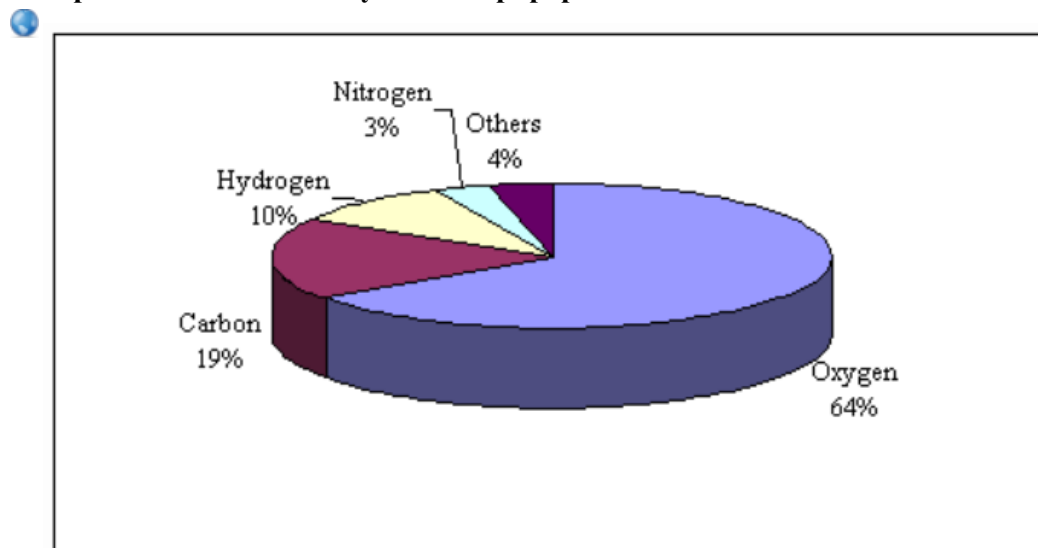
The most common elements in the human body are:

# 1 - oxygen - 65%

# 2 - carbon - 18%

# 3 - hydrogen - 10%

<http://www.freeinfosociety.com/site.php?postnum=658>





# Periodic Law

PERIODIC LAW - when elements are arranged in order of increasing atomic mass, chemical and physical properties form a pattern that repeats at regular intervals.

The organization of Mendeleev's periodic table was based upon placing elements with similar properties in columns in the table.

The table was successful in being accepted because it allowed the prediction of the properties of elements that had not yet been found.

Family - or **group** of elements

- a vertical column in the periodic table.
- elements having similar chemical properties. Ex. Group 1

Period - a horizontal row of elements.

- elements whose properties change from metallic to nonmetallic as you move from left to right on the periodic table.

\*Reactivity of metals increases as you go down and left\*

\*Reactivity of nonmetal increases as you move up and right\*

## **Traditional Groups**

*Alkali Metals* - elements found in group 1. They normally are soft, silver-colored metals that react readily with water forming basic solutions.

*Alkaline Earth Metals* - elements found in group 2. They are light, reactive metals that form oxide coatings.

*Halogens* - elements in group 17  
- are extremely reactive nonmetals.

*Noble Gases* - elements in group 18  
- very unreactive gases.

*Representative Elements* - are elements in groups 1, 2, 13 to 18. These elements best follow the periodic law and are often used to demonstrate theories.

*Transition Elements* - elements found in groups 3 to 10 ("D block")  
- elements whose electrons enter inner shells as atomic number increases

**Atomic Mass** - is the relative mass of an atom as compared to the mass of a carbon atom. (has been assigned a mass of 12 a.m.u's.)

1 atomic mass unit (a.m.u) - is 1/12 the mass of a carbon atom.

Period	1A	2A											3A	4A	5A	6A	7A	8A																													
	H	He	Metals										B	C	N	O	F	Ne																													
1	H	He											B	C	N	O	F	Ne																													
2	Li	Be	Nonmetals and Noble gases										B	C	N	O	F	Ne																													
3	Na	Mg	3B	4B	5B	6B	7B	8B		1B	2B	Al	Si	P	S	Cl	Ar																														
4	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr																													
5	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe																													
6	Cs	Ba	La		Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn																												
7	Fr	Ra	Unq		Unp	Unh	Uns	Uno	Une																																						
			<table border="1"> <tr> <td>6</td> <td>La</td> <td>Ce</td> <td>Pr</td> <td>Nd</td> <td>Pm</td> <td>Sm</td> <td>Eu</td> <td>Gd</td> <td>Tb</td> <td>Dy</td> <td>Ho</td> <td>Er</td> <td>Tm</td> <td>Yb</td> <td>Lu</td> </tr> <tr> <td>7</td> <td>Ac</td> <td>Th</td> <td>Pa</td> <td>U</td> <td>Np</td> <td>Pu</td> <td>Am</td> <td>Cm</td> <td>Bk</td> <td>Cf</td> <td>Es</td> <td>Fm</td> <td>Md</td> <td>No</td> <td>Lr</td> </tr> </table>													6	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	7	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
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## Periodic Table of the Elements

I	II											III	IV	V	VI	VII	0																													
H <sup>1</sup>																	He <sup>2</sup>																													
Li <sup>3</sup>	Be <sup>4</sup>	Transition Metals										B <sup>5</sup>	C <sup>6</sup>	N <sup>7</sup>	O <sup>8</sup>	F <sup>9</sup>	Ne <sup>10</sup>																													
Na <sup>11</sup>	Mg <sup>12</sup>	III B	IV B	V B	VI B	VII B	VIII B				IB	II B	Al <sup>13</sup>	Si <sup>14</sup>	P <sup>15</sup>	S <sup>16</sup>	Cl <sup>17</sup>	Ar <sup>18</sup>																												
K <sup>19</sup>	Ca <sup>20</sup>	Sc <sup>21</sup>	Ti <sup>22</sup>	V <sup>23</sup>	Cr <sup>24</sup>	Mn <sup>25</sup>	Fe <sup>26</sup>	Co <sup>27</sup>	Ni <sup>28</sup>	Cu <sup>29</sup>	Zn <sup>30</sup>	Ga <sup>31</sup>	Ge <sup>32</sup>	As <sup>33</sup>	Se <sup>34</sup>	Br <sup>35</sup>	Kr <sup>36</sup>																													
Rb <sup>37</sup>	Sr <sup>38</sup>	Y <sup>39</sup>	Zr <sup>40</sup>	Nb <sup>41</sup>	Mo <sup>42</sup>	Tc <sup>43</sup>	Ru <sup>44</sup>	Rh <sup>45</sup>	Pd <sup>46</sup>	Ag <sup>47</sup>	Cd <sup>48</sup>	In <sup>49</sup>	Sn <sup>50</sup>	Sb <sup>51</sup>	Te <sup>52</sup>	I <sup>53</sup>	Xe <sup>54</sup>																													
Cs <sup>55</sup>	Ba <sup>56</sup>	57-71	Hf <sup>72</sup>	Ta <sup>73</sup>	W <sup>74</sup>	Re <sup>75</sup>	Os <sup>76</sup>	Ir <sup>77</sup>	Pt <sup>78</sup>	Au <sup>79</sup>	Hg <sup>80</sup>	Tl <sup>81</sup>	Pb <sup>82</sup>	Bi <sup>83</sup>	Po <sup>84</sup>	At <sup>85</sup>	Rn <sup>86</sup>																													
Fr <sup>87</sup>	Ra <sup>88</sup>	89-103	Rf <sup>104</sup>	Ha <sup>105</sup>	106	107	108	109																																						
Lanthanides		<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td>57</td><td>58</td><td>59</td><td>60</td><td>61</td><td>62</td><td>63</td><td>64</td><td>65</td><td>66</td><td>67</td><td>68</td><td>69</td><td>70</td><td>71</td> </tr> <tr> <td>La</td><td>Ce</td><td>Pr</td><td>Nd</td><td>Pm</td><td>Sm</td><td>Eu</td><td>Gd</td><td>Tb</td><td>Dy</td><td>Ho</td><td>Er</td><td>Tm</td><td>Yb</td><td>Lu</td> </tr> </table>															57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
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	Metal		Metalloid		Nonmetal
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Element Name	Atomic Number	Element Symbol	Group Number	Period Number	SATP State
radium	88	Ra	2	7	S
			1	6	
	19				
antimony					
		S			
			9	4	
barium					
	28				
		U			
			17	2	
	30				

# **Homework**

## **Periodic Table Assignment**

**Bring Lab books**