

Format (Implied Organization) often used for humor

The Periodic Table of Dessert

S Sugar 0.0																	B Butter 0.1	
M Meringue 0.2	Sa Salt 0.3																	Lt Lemon 0.4
Cs Custard 0.5	Ci Cinnamon 0.6																	Cr Cream 0.7
Sm Sorghum 0.8	N Nutmeg 0.9	Pn Peanut 1.0	Ar Apricot 1.1	Pi Pineapple 1.2	Fi Fruit 1.3	W Walnut 1.4	Mc Macadamia 1.5	Ct Custard 1.6	Al Almond 1.7	P Peanut 1.8	Cc Cocoa 1.9							
Ms Marshmallow 2.0	Cl Custard 2.1	Cf Cinnamon 2.2	Mi Mint 2.3	An Anise 2.4	Lc Licorice 2.5	Ps Pistachio 2.6	Ti Tiramisu 2.7	Ta Tiramisu 2.8	Mp Marshmallow 2.9	Ge Gelatin 3.0	Vs Vanilla 3.1							
Bs Biscuits 3.2	Ca Custard 3.3	Cn Cinnamon 3.4	Dt Dessert 3.5	Pr Pineapple 3.6	R Raisin 3.7	Fg Fruit 3.8	Mm Marshmallow 3.9	Rh Rhubarb 4.0	Pu Pumpkin 4.1	Mw Marshmallow 4.2	La Lemon 4.3							
Mo Molasses 4.4	G Ginger 4.5																	
L Lemon 0.20	Li Lime 0.30	Or Orange 0.40	A Apple 0.50	Ba Banana 0.60	At Apricot 0.70	Rb Raspberry 0.80	Bb Blackberry 0.90	Ce Cherry 1.00	Sb Strawberry 1.10									
Ma Mango 1.20	To Tiramisu 1.30	Br Brandy 1.40	Wh Whiskey 1.50	Bn Banana 1.60	Rm Rhubarb 1.70	Gm Ginger 1.80	Cm Custard 1.90	Fr Fruit 2.00	Co Cocoa 2.10									

The Periodic Table of Hardware

Row 1: H (Hammer), He (Headset)

Row 2: Li (Liquor), Be (Belt), Ne (Nail)

Row 3: Na (Nail), Mg (Mug), Ar (Axe)

Row 4: K (Key), Ca (Candle), Sc (Screw), Ti (Tire), V (Vase), Cr (Crown), Mn (Mug), Fe (Fence), Co (Cup), Ni (Nail), Cu (Cup), Zn (Zinc), Ga (Gauge), Ge (Gear), As (Axe), Se (Screw), Br (Belt), Kr (Kettle)

Row 5: Rb (Ruler), Sr (Screw), Y (Yarn), Zr (Zinc), Nb (Nail), Mo (Mug), Tc (Tire), Ru (Ruler), Rh (Rhubarb), Pd (Pumpkin), Ag (Axe), Cd (Candle), In (Iron), Sn (Screw), Sb (Screw), Te (Tire), I (Iron), Xe (X-ray)

Row 6: Cs (Cup), Ba (Belt), La (Liquor), Hf (Hammer), Ta (Tire), W (Wrench), Re (Ruler), Os (Oven), Ir (Iron), Pt (Pumpkin), Au (Axe), Hg (Hammer), Tl (Tire), Pb (Pumpkin), Bi (Belt), Po (Pumpkin), At (Axe), Rn (Ruler)

Row 7: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 8: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 9: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 10: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 11: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 12: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 13: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 14: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

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Row 156: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 157: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 158: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 159: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 160: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 161: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 162: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 163: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 164: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 165: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 166: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 167: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 168: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 169: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 170: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 171: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 172: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 173: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 174: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 175: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 176: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 177: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 178: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 179: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 180: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 181: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 182: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 183: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 184: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 185: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 186: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 187: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 188: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

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Row 190: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 191: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 192: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 193: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 194: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 195: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 196: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 197: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 198: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 199: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 200: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 201: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 202: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 203: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 204: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 205: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 206: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 207: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 208: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

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Row 210: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 211: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 212: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 213: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 214: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 215: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 216: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (Hammer), Db (Dish), Sg (Shovel), Bh (Basketball), Mt (Mug)

Row 217: Fr (Fruite), Ra (Ruler), Ac (Axe), Hf (

Scoville Units

Periodic Table of Scoville Units™

1 Bp Sweet Bell 0																	2 Pi Pimento 0	
3 Cy Cherry 0 - 500	4 Pe Pepperoncini 100 - 500																	10 An Ancho 1,000 - 2,000
11 Mu Mulato 1,000 - 2,000	12 Pa Pasilla 1,000 - 2,000																	18 Mi Mirasol 2,500 - 5,000
19 Gu Guajillo 2,500 - 5,000	20 Ja Jalapeno 2,500 - 8,000	21 Cp Chipotle 5,000 - 8,000	22 Hw Hot Wax 5,000 - 10,000	23 Py Puya 5,000 - 10,000	24 Hi Hidalgo 6,000 - 17,000	25 Se Serrano 8,000 - 22,000	26 Ma Manzano 12,000 - 30,000	27 Sh Shipkas 12,000 - 30,000	28 Da De Arbol 15,000 - 30,000	29 Jo Jaloro 30,000 - 50,000	30 Aj Aji 30,000 - 50,000	31 Ta Tabasco 30,000 - 50,000	32 Ca Cayenne 30,000 - 50,000	33 Sk Santitas 40,000 - 50,000	34 Sc Super Chile 40,000 - 50,000	35 Pq Piquin 40,000 - 50,000	36 Ya Yatsufusa 50,000 - 75,000	
37 Hm Haimen 70,000 - 80,000	38 Ci Chiltepin 80,000 - 85,000	39 Th Thai 90,000 - 100,000	40 Tb Tabiche 100,000 - 110,000	41 Ba Bahamian 100,000 - 125,000	42 Cc Carolina Cayenne 100,000 - 125,000	43 Ku Kumataka 125,000 - 150,000	44 Jh Jamaican Hot 150,000 - 200,000	45 Be Birds Eye 150,000 - 225,000	46 Te Tepin (Wild) 200,000 - 240,000	47 Dt Devil Tongue 225,000 - 325,000	48 Fa Fatali 225,000 - 325,000	49 Oh Orange Habanero 325,000 - 375,000	50 Sb Scotch Bonnet 375,000 - 425,000	51 Ch Chocolate Habanero 425,000 - 575,000	52 Rs Red Savina Habanero 575,000 - 1,041,427	53 Bj Bhut Jolokia 1,041,427		

1

Bp

Sweet Bell

0

Pepper Rank

Symbol

Pepper Name

Scoville Units

5

El

El-Paso

500 - 700

6

Sf

Santa Fe Grande

500 - 750

7

Co

Coronado

700 - 1,000

8

Es

Espanola

1,000 - 2,000

9

Po

Poblanco

1,000 - 2,000

10

An

Ancho

1,000 - 2,000

13

An

Anaheim

500 - 2,500

14

Sa

Sandia

500 - 2,500

15

Nu

NuMex big Jim

500 - 2,500

16

Ro

Rocotillo

1,500 - 2,500

17

Pu

Pulla

700 - 2,000

18

Mi

Mirasol

2,500 - 5,000

31

Ta

Tabasco

30,000 - 50,000

32

Ca

Cayenne

30,000 - 50,000

33

Sk

Santitas

40,000 - 50,000

34

Sc

Super Chile

40,000 - 50,000

35

Pq

Piquin

40,000 - 50,000

36

Ya

Yatsufusa

50,000 - 75,000

Scoville Units Foods

thescienceofheat.com

SCOVILLE

FOOD INSTITUTE

EST. 2007

Science-Fiction Periodic Table

PERIODIC TABLE OF SCI-FI FILM AND TELEVISION

Other science fiction is combined from the basic atomic elements to bond as new molecules

20i + Dr → Torchwood
Siv + Tw + Bio → Battle Angel Alita
Iron Legacy + Ir → 2Tm + Rb(Xo)
3Et + 8Rv + Los + Xo → Avatar

starslip.com

Sometimes used for emphasis (Elements of Life)

Group	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Period	<div><div>Key</div><div>Biologically relevant elements colored</div><div><div></div>Major, essential, all life</div><div><div></div>Major anions, all life</div><div><div></div>Major cations, all life</div><div><div></div>Essential, trace, all life</div><div><div></div>Major biological transition metals</div><div><div></div>Specialized uses, some life</div><div><div></div>May be bound, transported, reduced, and/or methylated</div><div><div></div>Inert or unknown biological function</div></div>																	
1	<div>1</div> <div>H</div>																	<div>2</div> <div>He</div>
2	<div>3</div> <div>Li</div>	<div>4</div> <div>Be</div>											<div>5</div> <div>B</div>	<div>6</div> <div>C</div>	<div>7</div> <div>N</div>	<div>8</div> <div>O</div>	<div>9</div> <div>F</div>	<div>10</div> <div>Ne</div>
3	<div>11</div> <div>Na</div>	<div>12</div> <div>Mg</div>											<div>13</div> <div>Al</div>	<div>14</div> <div>Si</div>	<div>15</div> <div>P</div>	<div>16</div> <div>S</div>	<div>17</div> <div>Cl</div>	<div>18</div> <div>Ar</div>
4	<div>19</div> <div>K</div>	<div>20</div> <div>Ca</div>	<div>21</div> <div>Sc</div>	<div>22</div> <div>Ti</div>	<div>23</div> <div>V</div>	<div>24</div> <div>Cr</div>	<div>25</div> <div>Mn</div>	<div>26</div> <div>Fe</div>	<div>27</div> <div>Co</div>	<div>28</div> <div>Ni</div>	<div>29</div> <div>Cu</div>	<div>30</div> <div>Zn</div>	<div>31</div> <div>Ga</div>	<div>32</div> <div>Ge</div>	<div>33</div> <div>As</div>	<div>34</div> <div>Se</div>	<div>35</div> <div>Br</div>	<div>36</div> <div>Kr</div>
5	<div>37</div> <div>Rb</div>	<div>38</div> <div>Sr</div>	<div>39</div> <div>Y</div>	<div>40</div> <div>Zr</div>	<div>41</div> <div>Nb</div>	<div>42</div> <div>Mo</div>	<div>43</div> <div>Tc</div>	<div>44</div> <div>Ru</div>	<div>45</div> <div>Rh</div>	<div>46</div> <div>Pd</div>	<div>47</div> <div>Ag</div>	<div>48</div> <div>Cd</div>	<div>49</div> <div>In</div>	<div>50</div> <div>Sn</div>	<div>51</div> <div>Sb</div>	<div>52</div> <div>Te</div>	<div>53</div> <div>I</div>	<div>54</div> <div>Xe</div>
6	<div>55</div> <div>Cs</div>	<div>56</div> <div>Ba</div>	<div>71</div> <div>Lu</div>	<div>72</div> <div>Hf</div>	<div>73</div> <div>Ta</div>	<div>74</div> <div>W</div>	<div>75</div> <div>Re</div>	<div>76</div> <div>Os</div>	<div>77</div> <div>Ir</div>	<div>78</div> <div>Pt</div>	<div>79</div> <div>Au</div>	<div>80</div> <div>Hg</div>	<div>81</div> <div>Tl</div>	<div>82</div> <div>Pb</div>	<div>83</div> <div>Bi</div>	<div>84</div> <div>Po</div>	<div>85</div> <div>At</div>	<div>86</div> <div>Rn</div>
7	<div>87</div> <div>Fr</div>	<div>88</div> <div>Ra</div>																
Lanthanoids			<div>57</div> <div>La</div>	<div>58</div> <div>Ce</div>	<div>59</div> <div>Pr</div>	<div>60</div> <div>Nd</div>	<div>61</div> <div>Pm</div>	<div>62</div> <div>Sm</div>	<div>63</div> <div>Eu</div>	<div>64</div> <div>Gd</div>	<div>65</div> <div>Tb</div>	<div>66</div> <div>Dy</div>	<div>67</div> <div>Ho</div>	<div>68</div> <div>Er</div>	<div>69</div> <div>Tm</div>	<div>70</div> <div>Yb</div>		
Actinoids			<div>89</div> <div>Ac</div>	<div>90</div> <div>Th</div>	<div>91</div> <div>Pa</div>	<div>92</div> <div>U</div>	<div>93</div> <div>Np</div>	<div>94</div> <div>Pu</div>	<div>95</div> <div>Am</div>	<div>96</div> <div>Cm</div>	<div>97</div> <div>Bk</div>	<div>98</div> <div>Cf</div>	<div>99</div> <div>Es</div>	<div>100</div> <div>Fm</div>	<div>101</div> <div>Md</div>	<div>102</div> <div>No</div>		

The Modern Periodic Table

Periodic = repeating

Elements ordered by Z show “repeating properties” ◀ Very Important!

Period: rows ~ similar trends

Groups: columns ~ similar chemical properties

Groups = chemical families

Periodic Table of the Elements

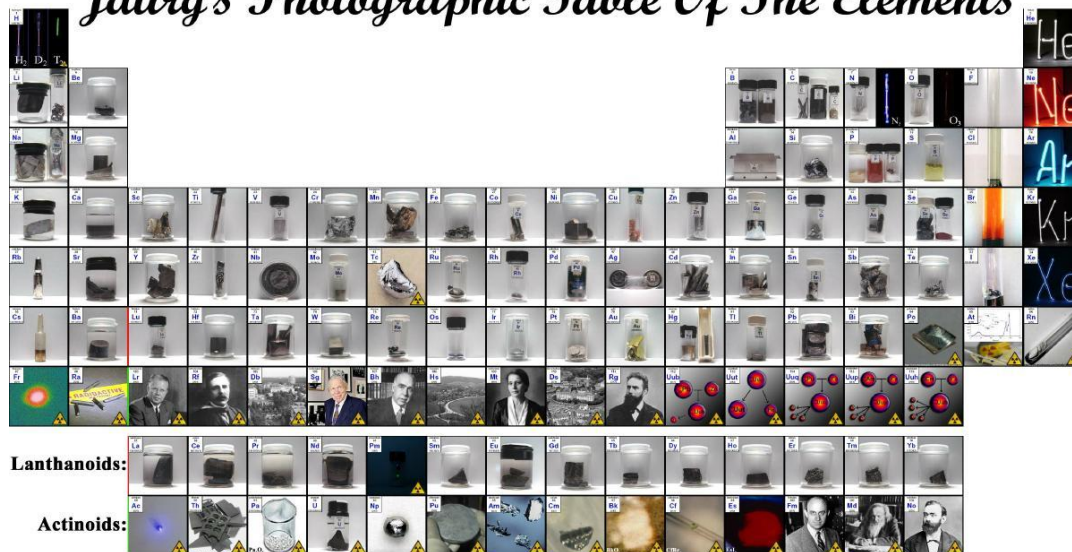
The table shows elements from Hydrogen (H) to Oganesson (Og). The Lanthanide Series (Ce-Lu) and Actinide Series (Th-Lr) are shown below the main table.

Has a variety of Forms
Key element is periodicity

Multiple Formats:
Emphasize Periodicity
Not Tested

Photographic

Jdurg's Photographic Table Of The Elements



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Welch Chart (Hollywood set dressing for years)

Revised Edition 1993

PERIODIC CHART OF THE ATOMS

The Atoms Grouped According to the Number of Outer [Valence] Electrons

NIST

CODE FOR GROUPS

Numbers of electrons in the completed shells

↓	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	↓
↓	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	↓
1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	1
2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	2
3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	3
4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	4
5	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	5
6	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	6
7	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	7
8	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	8
9	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	9
10	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	10
11	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	11
12	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	12
13	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	13
14	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	14
15	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	15
16	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	16
17	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	17
18	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18
19	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
20	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	20
21	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	21
22	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	22
23	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	23
24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	24
25	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	25
26	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	26
27	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	27
28	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	28
29	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	29
30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	30
31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	31
32	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	32
33	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	33
34	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	34
35	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	35
36	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	36
37	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	37
38	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	38
39	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	39
40	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	40
41	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	41
42	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	42
43	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	43
44	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	44
45	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	45
46	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	46
47	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	47
48	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	48
49	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	49
50	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	50
51	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	51
52	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	52
53	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	53
54	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	54
55	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	55
56	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	56
57	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	57
58	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	58
59	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	59
60	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	60
61	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	61
62	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	62
63	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	63
64	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	64
65	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	65
66	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	66
67	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	67
68	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	68
69	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	69
70	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	70
71	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	71
72	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	72
73	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	73
74	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	74
75	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	75
76	1	2	3	4	5	6	7	8	9										

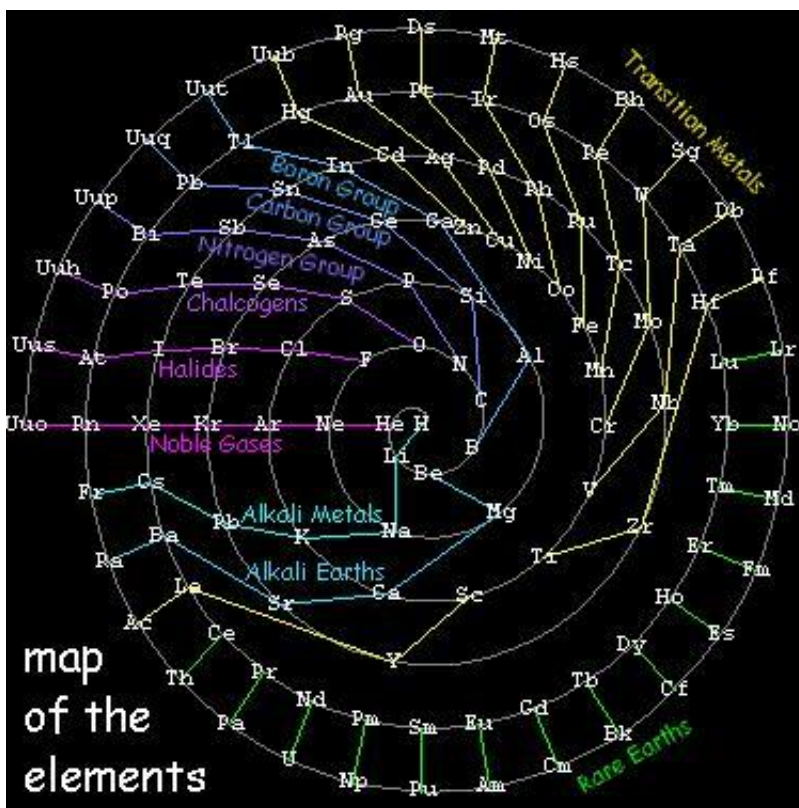
Another “Blocked Version”

																H	He						
																1	2						
Li	Be															B	C	N	O	F	Ne		
3	4															5	6	7	8	9	10		
Na	Mg															Al	Si	P	S	Cl	Ar		
11	12															13	14	15	16	17	18		
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn						Ga	Ge	As	Se	Br	Kr	
19	20	21	22	23	24	25	26	27	28	29	30						31	32	33	34	35	36	
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd						In	Sn	Sb	Te	I	Xe	
37	38	39	40	41	42	43	44	45	46	47	48						49	50	51	52	53	54	
Cs	Ba	Lu	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg						Tl	Pb	Bi	Po	At	Rn	
55	56	71	72	73	74	75	76	77	78	79	80						81	82	83	84	85	86	
Fr	Ra	Lr	Unq	Unp	Unh	Uns	Pm																
87	88	103	104	105	106	107	108																
La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb										
57	58	59	60	61	62	63	64	65	66	67	68	69	70										
Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No										
89	90	91	92	93	94	95	96	97	98	99	100	101	102										

A “Circular” Version

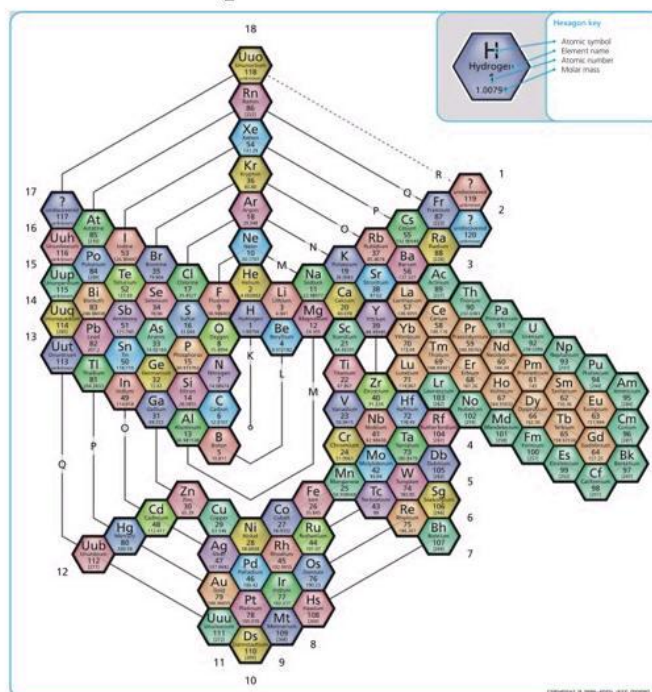
Another Circular Pattern

Spiral “Map”



Hexagonal View

Periodic table gets a makeover



Planar Periodic Table

n = 1

n = 2

n = 3

n = 4

n = 5

n = 6

n = 7

n = 8

Pyramidal Periodic Table

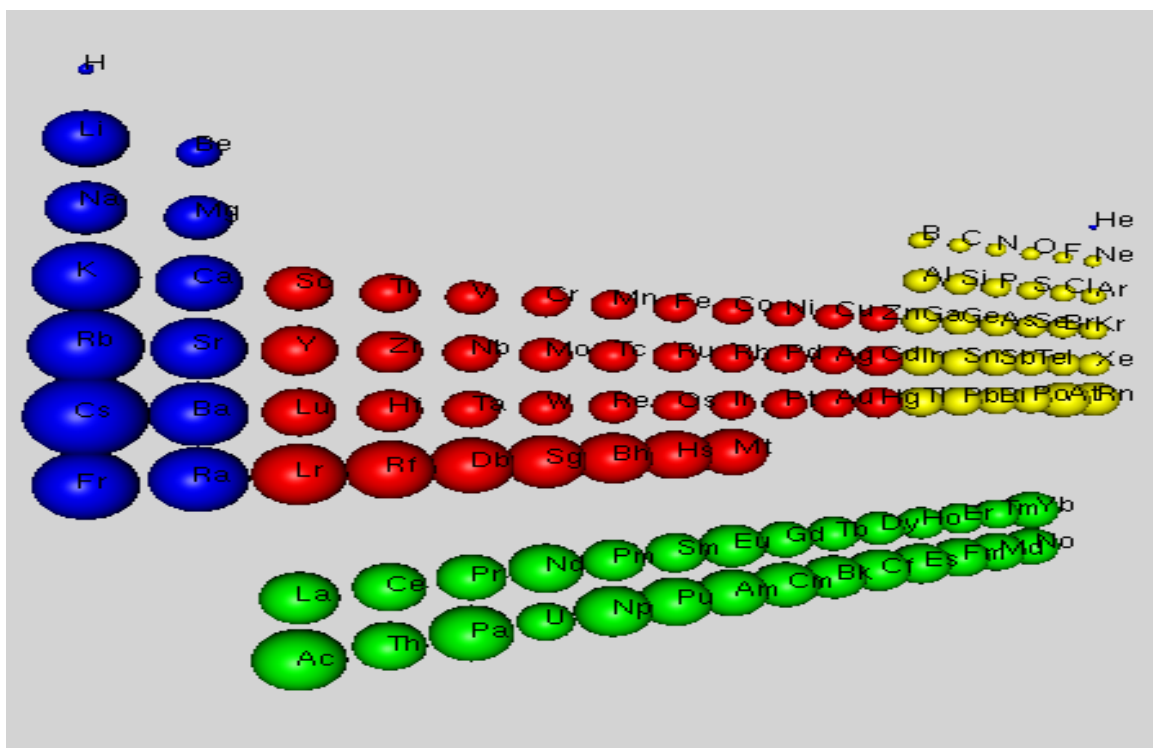
This Pyramidal Table is based upon the periodic table developed by William B. Jensen of the University of Cincinnati.

Heavy black lines indicate elements with the same type of outer electron shells. Blue lines show elements belonging to the same groups. Red lines show secondary relationships in chemical properties.

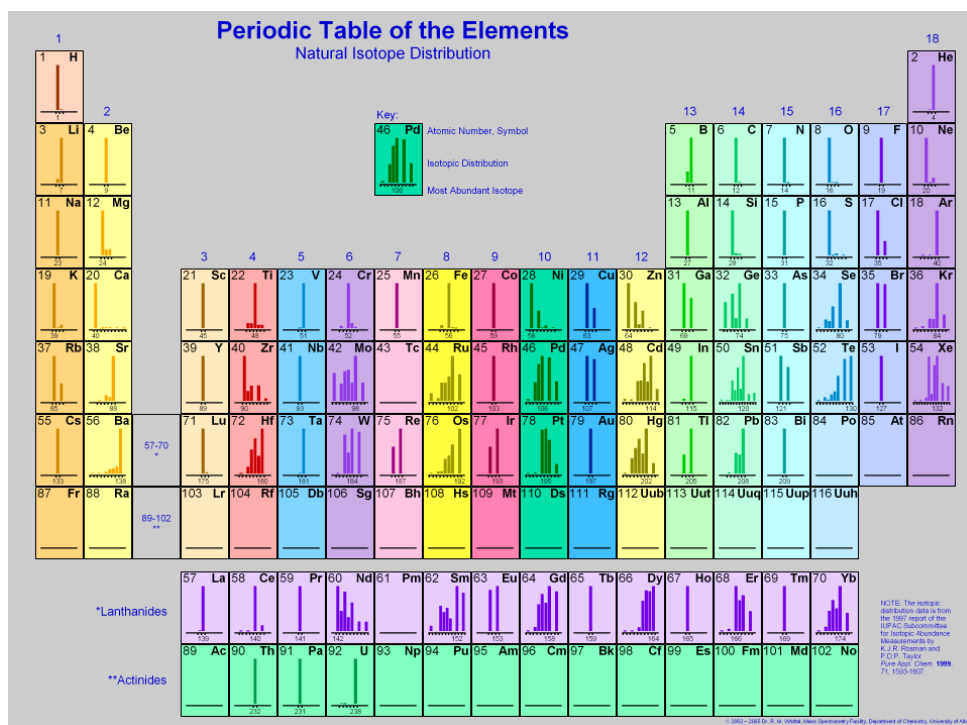
A version of this table accompanied by an informative article about the history of the periodic table appeared in the September 1998 issue of Scientific American, written by Eric R. Scerri, Ph.D.

1		2													
H		He													
3		4		5		6		7		8		9		10	
Li		Be		B		C		N		O		F		Ne	
11		12		13		14		15		16		17		18	
Na		Mg		Al		Si		P		S		Cl		Ar	
19		20		21		22		23		24		25		26	
K		Ca		Sc		Ti		V		Cr		Mn		Fe	
27		28		29		30		31		32		33		34	
Co		Ni		Cu		Zn		Ga		Ge		As		Se	
35		36		37		38		39		40		41		42	
Br		Kr		Rb		Sr		Y		Zr		Nb		Mo	
43		44		45		46		47		48		49		50	
Tc		Ru		Rh		Pd		Ag		Cd		In		Sn	
51		52		53		54		55		56		57		58	
Sb		Te		I		Xe		Fr		Ra		Ac		Th	
59		60		61		62		63		64		65		66	
La		Ce		Pr		Nd		Pm		Sm		Eu		Gd	
67		68		69		70		71		72		73		74	
Tb		Dy		Ho		Er		Tm		Yb		Lu		Hf	
75		76		77		78		79		80		81		82	
Re		Os		Ir		Pt		Au		Hg		Tl		Pb	
83		84		85		86		87		88		89		90	
Bi		Po		At		Rn		Fr		Ra		Ac		Th	
91		92		93		94		95		96		97		98	
Pa		U		Np		Pu		Am		Cm		Bk		Cf	
99		100		101		102		103		104		105		106	
Es		Fm		Md		No		Lr		Rf		Db		Sg	
107		108		109		110		111		112		113		114	
Bh		Hs		Mt											
115		116		117		118									

Atomic Size (Increases Within Family With Increasing Weight)



Isotope Information (typically not given)



The Periodic Table Notation

16	← Z
S	← Symbol
32.07	← AMU (weighted)

Families – Direct Result of Periodicity
Families have similar chemical properties

- Group 1A: alkali metals
- Group 2A: alkaline earth metals
- Group 7A: halogens
- Group 8A: noble (inert) gases

Representative: Outside Columns
Left: 2 Columns Right: 6 Columns
Transition: Inner Block (10 columns)

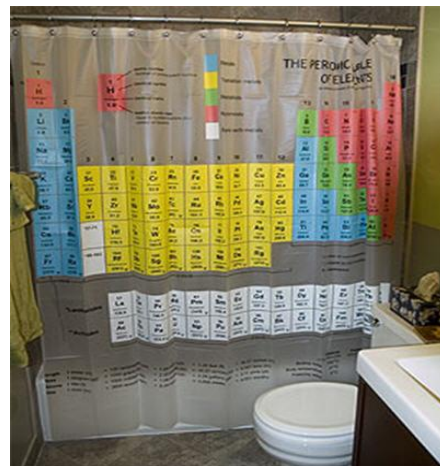
Periodic Table of the Elements																				
1	2											11	12						19	20
H	He											Na	Mg						K	Ca
3	4											13	14						31	32
Li	Be											B	C						Ga	Ge
5	6											15	16						33	34
Na	Mg											Al	Si						In	Sn
7	8											17	18						51	52
Li	Be											P	S						Sb	Te
9	10											19	20						53	54
Na	Mg											Cl	Ar						I	Xe
11	12											35	36						83	84
Li	Be											Br	Kr						Pol	At
13	14											37	38						85	86
Na	Mg											Rb	Sr						Fr	Ra
15	16											39	40						87	88
Li	Be											Y	Zr						Ac	Th
17	18											39	40						89	90
Na	Mg											Sc	Ti						Pa	U
19	20											41	42						91	92
Li	Be											V	Cr						Np	Pu
21	22											43	44						93	94
Na	Mg											Mn	Fe						Am	Cm
23	24											45	46						95	96
Li	Be											Co	Ni						97	98
25	26											47	48						99	100
Na	Mg											Cu	Zn						101	102
27	28											49	50						103	104
Li	Be											Ga	Ge						105	106
29	30											51	52						107	108
Na	Mg											As	Se						109	110
31	32											53	54						111	112
Li	Be											Sb	Te						113	114
33	34											55	56						115	116
Na	Mg											Bi	Po						117	118
35	36											57	58						119	120
Li	Be											Fr	Ra						121	122
37	38											87	88						123	124
Na	Mg											Ac	Th						125	126
39	40											89	90						127	128
Li	Be											Y	Zr						129	130
41	42											91	92						131	132
Na	Mg											Sc	Ti						133	134
43	44											93	94						135	136
Li	Be											V	Cr						137	138
45	46											95	96						139	140
Na	Mg											Mn	Fe						141	142
47	48											97	98						143	144
Li	Be											Co	Ni						145	146
49	50											99	100						147	148
Na	Mg											Cu	Zn						149	150
51	52											101	102						151	152
Li	Be											Ga	Ge						153	154
53	54											103	104						155	156
Na	Mg											As	Se						157	158
55	56											105	106						159	160
Li	Be											Sb	Te						161	162
57	58											107	108						163	164
Na	Mg											Bi	Po						165	166
59	60											109	110						167	168
Li	Be											Fr	Ra						169	170
61	62											87	88						171	172
Na	Mg											Ac	Th						173	174
63	64											89	90						175	176
Li	Be											Y	Zr						177	178
65	66											91	92						179	180
Na	Mg											Sc	Ti						181	182
67	68											93	94						183	184
Li	Be											V	Cr						185	186
69	70											95	96						187	188
Na	Mg											Mn	Fe						189	190
71	72											97	98						191	192
Li	Be											Co	Ni						193	194
73	74											99	100						195	196
Na	Mg											Cu	Zn						197	198
75	76											101	102						199	200
Li	Be											Ga	Ge						201	202
77	78											103	104						203	204
Na	Mg											As	Se						205	206
79	80											105	106						207	208
Li	Be											Sb	Te						209	210
81	82											107	108						211	212
Na	Mg											Bi	Po						213	214
83	84											109	110						215	216
Li	Be											Fr	Ra						217	218
85	86											87	88						219	220
Na	Mg											Ac	Th						221	222
87	88											89	90						223	224
Li	Be											Y	Zr						225	226
89	90											91	92						227	228
Na	Mg											Sc	Ti						229	230
91	92											93	94						231	232
Li	Be											V	Cr						233	234
93	94											95	96						235	236
Na	Mg											Mn	Fe						237	238
95	96											97	98						239	240
Li	Be											Co	Ni						241	242
97	98											99	100						243	244
Na	Mg											Cu	Zn						245	246
99	100											101	102						247	248
Li	Be											Ga	Ge						249	250
101	102											103	104						251	252
Na	Mg											As	Se						253	254
103	104											105	106						255	256
Li	Be											Sb	Te						257	258
105	106											107	108						259	260
Na	Mg											Bi	Po						261	262
107	108											109	110						263	264
Li	Be											Fr	Ra						265	266
109	110											87	88						267	268
111	112											89	90						269	270
Na	Mg											Ac	Th						271	272
113	114											91	92						273	274
Li	Be											Y	Zr						275	276
115	116											93	94						277	278
Na	Mg											Sc	Ti						279	280
117	118											95	96						281	282
Li	Be											V	Cr						283	284
119	120											97	98						285	286
Na	Mg											Mn	Fe						287	288
121	122											99	100						289	290
Li	Be											Co	Ni						291	292
123	124											101	102						293	294
Na	Mg											Cu	Zn						295	296
125	126											103	104						297	298
Li	Be											Ga	Ge						299	300
127	128											105	106						301	302
Na	Mg											As	Se						303	304
129	130											107	108						305	306
Li	Be											Sb	Te						307	308
131	132											109	110						309	310
Na	Mg											Bi	Po						311	312
133	134											111	112						313	314
Li	Be											Fr	Ra						315	316
135	136											87	88						317	318
Na	Mg											Ac	Th						319	320
137	138											89	90						321	322
Li	Be											Y	Zr						323	324
139	140											91	92						325	326
Na	Mg											Sc	Ti						327	328
141	142											93	94						329	330
Li	Be											V	Cr						331	332
143	144											95	96						333	334
Na	Mg											Mn	Fe						335	336
145	146											97	98						337	338
Li	Be											Co	Ni						339	340
147	148											99	100						341	342
Na	Mg											Cu	Zn						343	344
149	150											101	102						345	346
Li	Be											Ga	Ge						347	348
151	152											103	104						349	350
Na	Mg											As	Se						351	352
153	154											105	106						353	354
Li	Be											Sb	Te						355	356
155	156											107	108						357	358
Na	Mg											Bi	Po						359	360
157	158											109	110						361	362
Li	Be											Fr	Ra						363	364
159	160											87	88						365	366
Na	Mg											Ac	Th						367	368
161	162											89	90						369	370
Li	Be											Y	Zr						371	372
163	164											91	92						373	374
Na	Mg											Sc	Ti						375	376
165	166											93	94						377	378
Li	Be											V	Cr						379	380
167	168											95	96						381	382
Na	Mg											Mn	Fe						383	384
169	170											97	98						385	386
Li	Be											Co	Ni						387	388
171	172											99	100						389	390
Na	Mg											Cu	Zn						391	392
173	174											101	102						393	394
Li	Be											Ga	Ge						395	396
175	176											103	104						397	398
Na	Mg											As	Se						399	400
177	178											105	106						401	402
Li	Be											Sb	Te						403	404
179	180											107	108						405	406
Na	Mg											Bi	Po						407	408
181	182											109	110						409	410
Li	Be											Fr	Ra						411	412
183	184											87	88						413	414
Na	Mg											Ac	Th						415	416

* Lanthanide Series

+ Actinide Series

Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

'cause memorizing is preferable to these training aids



Assignment

Continue Taking Unit 4 Practice Test

Blackboard only records highest score

Take until multiple 100's have been scored (questions are variable)

(Gives sense of test exam format and content)

The Practice Quiz is very similar to the Unit Exam

Success on Unit exam is directly related to practice exam experiences

Continue memorizing:

Polyatomic Ions

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