**Periods are horizontal**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 2 |
| **H** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **He** |
| **Hydrogen** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **Helium** |
| 1.0079 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 4.0026 |
| **3** | **4** |  |  |  |  |  |  |  |  |  |  | **5** | **6** | **7** | **8** | **9** | **10** |
| **Li** | **Be** |  |  |  |  |  |  |  |  |  |  | **B** | **C** | **N** | **O** | **F** | **Ne** |
| **Lithium** | **Beryllium** |  |  |  |  |  |  |  |  |  |  | **Boron** | **Carbon** | **Nitrogen** | **Oxygen** | **Fluorine** | **Neon** |
| 6.941 | 9.0122 |  |  |  |  |  |  |  |  |  |  | 10.81 | 12.011 | 14.007 | 15.999 | 18.998 | 20.179 |
| **11** | **12** |  |  |  |  |  |  |  |  |  |  | **13** | **14** | **15** | **16** | **17** | **18** |
| **Na** | **Mg** |  |  |  |  |  |  |  |  |  |  | **Al** | **Si** | **P** | **S** | **Cl** | **Ar** |
| **Sodium** | **Magnesium** |  |  |  |  |  |  |  |  |  |  | **Aluminum** | **Silicon** | **Phosphorus** | **Sulfur** | **Chlorine** | **Argon** |
| 22.990 | 24.305 |  |  |  |  |  |  |  |  |  |  | 26.982 | 28.086 | 30.974 | 32.06 | 35.453 | 39.948 |
| **19** | **20** | **21** | **22** | **23** | **24** | **25** | **26** | **27** | **28** | **29** | **30** | **31** | **32** | **33** | **34** | **35** | **36** |
| **K** | **Ca** | **Sc** | **Ti** | **V** | **Cr** | **Mn** | **Fe** | **Co** | **Ni** | **Cu** | **Zn** | **Ga** | **Ge** | **As** | **Se** | **Br** | **Kr** |
| **Potassium** | **Calcium** | **Scandium** | **Titanium** | **Vanadium** | **Chromium** | **Manganese** | **Iron** | **Cobalt** | **Nickel** | **Copper** | **Zinc** | **Gallium** | **Germanium** | **Arsenic** | **Selenium** | **Bromine** | **Krypton** |
| 39.098 | 40.08 | 44.956 | 47.90 | 50.941 | 51.996 | 54.938 | 55.847 | 58.933 | 58.71 | 63.546 | 65.38 | 69.72 | 72.59 | 74.922 | 78.96 | 79.904 | 83.80 |
| **37** | **38** | **39** | **40** | **41** | **42** | **43** | **44** | **45** | **46** | **47** | **48** | **49** | **50** | **51** | **52** | **53** | **54** |
| **Rb** | **Sr** | **Y** | **Zr** | **Nb** | **Mo** | **Tc** | **Ru** | **Rh** | **Pd** | **Ag** | **Cd** | **In** | **Sn** | **Sb** | **Te** | **I** | **Xe** |
| **Rubidium** | **Strontium** | **Yttrium** | **Zirconium** | **Niobium** | **Molybdenum** | **Technetium** | **Ruthenium** | **Rhodium** | **Palladium** | **Silver** | **Cadmium** | **Indium** | **Tin** | **Antimony** | **Tellurium** | **Iodine** | **Xenon** |
| 85.468 | 87.62 | 88.906 | 91.22 | 92.906 | 95.94 | (98) | 101.07 | 102.91 | 106.4 | 107.87 | 112.41 | 114.82 | 118.69 | 121.75 | 127.60 | 126.90 | 131.30 |
| **55** | **56** | **57** | **72** | **73** | **74** | **75** | **76** | **77** | **78** | **79** | **80** | **81** | **82** | **83** | **84** | **85** | **86** |
| **Cs** | **Ba** | \***La** | **Hf** | **Ta** | **W** | **Re** | **Os** | **Ir** | **Pt** | **Au** | **Hg** | **Tl** | **Pb** | **Bi** | **Po** | **At** | **Rn** |
| **Cesium** | **Barium** | **Lanthanum** | **Hafnium** | **Tantalum** | **Tungsten** | **Rhenium** | **Osmium** | **Iridium** | **Platinum** | **Gold** | **Mercury** | **Thallium** | **Lead** | **Bismuth** | **Polonium** | **Astatine** | **Radon** |
| 132.91 | 137.33 | 138.91 | 178.49 | 180.95 | 183.85 | 186.21 | 190.2 | 192.22 | 195.09 | 196.97 | 200.59 | 204.37 | 207.2 | 208.98 | (209) | (210) | (222) |
| **87** | **88** | **89** | **104** | **105** | **106** | **107** | **108** | **109** | **110** | **111** | **112** | **113** | **114** | **115** | **116** | **117** | **118** |
| **Fr** | **Ra** | ✝**Ac** | **Rf** | **Db** | **Sg** | **Bh** | **Hs** | **Mt** | **Ds** | **Rg** | **Cn** | **Nh** | **Fl** | **Mc** | **Lv** | **Ts** | **Og** |
| **Francium** | **Radium** | **Actinium** | **Rutherfordium** | **Dubnium** | **Seaborgium** | **Bohrium** | **Hassium** | **Meitnerium** | **Darmstadtium** | **Roentgenium** | **Copernicium** | **Nihonium** | **Flerovium** | **Moscovium** | **Livermorium** | **Tennessine** | **Oganesson** |
| (223) | (226) | (227) | (267) | (268) | (271) | (272) | (270) | (276) | (281) | (280) | (285) | (284) | (289) | (288) | (293) | (294) | (294) |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | **58** | **59** | **60** | **61** | **62** | **63** | **64** | **65** | **66** | **67** | **68** | **69** | **70** | **71** |  |
|  |  |  | **Ce** | **Pr** | **Nd** | **Pm** | **Sm** | **Eu** | **Gd** | **Tb** | **Dy** | **Ho** | **Er** | **Tm** | **Yb** | **Lu** |  |
|  | \*Lanthanide Series |  | **Cerium** | **Praseodymium** | **Neodymium** | **Promethium** | **Samarium** | **Europium** | **Gadolinium** | **Terbium** | **Dysprosium** | **Holmium** | **Erbium** | **Thulium** | **Ytterbium** | **Lutetium** |  |
|  |  |  | 140.12 | 140.91 | 144.24 | (145) | 150.4 | 151.96 | 157.25 | 158.93 | 162.50 | 164.93 | 167.26 | 168.93 | 173.04 | 174.97 |  |
|  |  |  | **90** | **91** | **92** | **93** | **94** | **95** | **96** | **97** | **98** | **99** | **100** | **101** | **102** | **103** |  |
|  |  |  | **Th** | **Pa** | **U** | **Np** | **Pu** | **Am** | **Cm** | **Bk** | **Cf** | **Es** | **Fm** | **Md** | **No** | **Lr** |  |
|  |  | ✝Actinide Series | **Thorium** | **Protactinium** | **Uranium** | **Neptunium** | **Plutonium** | **Americium** | **Curium** | **Berkelium** | **Californium** | **Einsteinium** | **Fermium** | **Mendelevium** | **Nobelium** | **Lawrencium** |  |
|  |  |  | 232.04 | 231.04 | 238.03 | (237) | (244) | (243) | (247) | (247) | (251) | (252) | (257) | (258) | (259) | (262) |  |

**Groups are vertical**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 2 |
| **H** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **He** |
| 1.0079 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 4.0026 |
| **3** | **4** |  |  |  |  |  |  |  |  |  |  | **5** | **6** | **7** | **8** | **9** | **10** |
| **Li** | **Be** |  |  |  |  |  |  |  |  |  |  | **B** | **C** | **N** | **O** | **F** | **Ne** |
| 6.941 | 9.0122 |  |  |  |  |  |  |  |  |  |  | 10.81 | 12.011 | 14.007 | 15.999 | 18.998 | 20.179 |
| **11** | **12** |  |  |  |  |  |  |  |  |  |  | **13** | **14** | **15** | **16** | **17** | **18** |
| **Na** | **Mg** |  |  |  |  |  |  |  |  |  |  | **Al** | **Si** | **P** | **S** | **Cl** | **Ar** |
| 22.990 | 24.305 |  |  |  |  |  |  |  |  |  |  | 26.982 | 28.086 | 30.974 | 32.06 | 35.453 | 39.948 |
| **19** | **20** | **21** | **22** | **23** | **24** | **25** | **26** | **27** | **28** | **29** | **30** | **31** | **32** | **33** | **34** | **35** | **36** |
| **K** | **Ca** | **Sc** | **Ti** | **V** | **Cr** | **Mn** | **Fe** | **Co** | **Ni** | **Cu** | **Zn** | **Ga** | **Ge** | **As** | **Se** | **Br** | **Kr** |
| 39.098 | 40.08 | 44.956 | 47.90 | 50.941 | 51.996 | 54.938 | 55.847 | 58.933 | 58.71 | 63.546 | 65.38 | 69.72 | 72.59 | 74.922 | 78.96 | 79.904 | 83.80 |
| **37** | **38** | **39** | **40** | **41** | **42** | **43** | **44** | **45** | **46** | **47** | **48** | **49** | **50** | **51** | **52** | **53** | **54** |
| **Rb** | **Sr** | **Y** | **Zr** | **Nb** | **Mo** | **Tc** | **Ru** | **Rh** | **Pd** | **Ag** | **Cd** | **In** | **Sn** | **Sb** | **Te** | **I** | **Xe** |
| 85.468 | 87.62 | 88.906 | 91.22 | 92.906 | 95.94 | (98) | 101.07 | 102.91 | 106.4 | 107.87 | 112.41 | 114.82 | 118.69 | 121.75 | 127.60 | 126.90 | 131.30 |
| **55** | **56** | **57** | **72** | **73** | **74** | **75** | **76** | **77** | **78** | **79** | **80** | **81** | **82** | **83** | **84** | **85** | **86** |
| **Cs** | **Ba** | \***La** | **Hf** | **Ta** | **W** | **Re** | **Os** | **Ir** | **Pt** | **Au** | **Hg** | **Tl** | **Pb** | **Bi** | **Po** | **At** | **Rn** |
| 132.91 | 137.33 | 138.91 | 178.49 | 180.95 | 183.85 | 186.21 | 190.2 | 192.22 | 195.09 | 196.97 | 200.59 | 204.37 | 207.2 | 208.98 | (209) | (210) | (222) |
| **87** | **88** | **89** | **104** | **105** | **106** | **107** | **108** | **109** | **110** | **111** | **112** | **113** | **114** | **115** | **116** | **117** | **118** |
| **Fr** | **Ra** | ✝**Ac** | **Rf** | **Db** | **Sg** | **Bh** | **Hs** | **Mt** | **Ds** | **Rg** | **Cn** | **Nh** | **Fl** | **Mc** | **Lv** | **Ts** | **Og** |
| (223) | (226) | (227) | (267) | (268) | (271) | (272) | (270) | (276) | (281) | (280) | (285) | (284) | (289) | (288) | (293) | (294) | (294) |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | **58** | **59** | **60** | **61** | **62** | **63** | **64** | **65** | **66** | **67** | **68** | **69** | **70** | **71** |  |
|  |  |  | **Ce** | **Pr** | **Nd** | **Pm** | **Sm** | **Eu** | **Gd** | **Tb** | **Dy** | **Ho** | **Er** | **Tm** | **Yb** | **Lu** |  |
|  |  | \*Lanthanide Series | 140.12 | 140.91 | 144.24 | (145) | 150.4 | 151.96 | 157.25 | 158.93 | 162.50 | 164.93 | 167.26 | 168.93 | 173.04 | 174.97 |  |
|  |  |  | **90** | **91** | **92** | **93** | **94** | **95** | **96** | **97** | **98** | **99** | **100** | **101** | **102** | **103** |  |
|  |  | ✝Actinide Series | **Th** | **Pa** | **U** | **Np** | **Pu** | **Am** | **Cm** | **Bk** | **Cf** | **Es** | **Fm** | **Md** | **No** | **Lr** |  |
|  |  |  | 232.04 | 231.04 | 238.03 | (237) | (244) | (243) | (247) | (247) | (251) | (252) | (257) | (258) | (259) | (262) |  |