

BUILDING THE PERIODIC TABLE LAB ACTIVITY (HONORS LEVEL)

The code letters A to Z have been assigned to the first 26 elements of the periodic table. They do not correlate in any way with the real symbols for these elements. Study the clues, based on experimental data, which are given below. Then place the code letters in their correct position on the table. Hint: First find out which group each family represents, then arrange the elements within the groups.

- The following elements belong together in families:
ZRD, SIFP, JXBE, LHT, QKA, WOV, CMY, UGN
- The element N has 4 valence electrons.
- UA₂ is the formula for a compound. In this compound, there are two atoms with an atomic number of 8.
- X is a noble gas.
- I is an alkali metal.
- M, having 3 half-filled orbitals, can form three bonds.
- H is an alkaline earth metal.
- W is a halogen.
- =====
- The ionization energy of T is greater than that of L, but less than that of H.
- Y is less metallic than M.
- Q's atomic radius is greater than that of K.
- The electrons of atom U are distributed over three energy levels.
- V is a liquid, whereas W is a gas at room temperature.
- The compound IW is less stable than FW. More metallic elements tend to form more stable compounds.
- Atom J has two protons.
- Z has the lowest atomic mass in its group.
- The electronegativity of element O is the largest on the periodic table.
- The density of S is 0.53 and that of I is 0.97. The metal with the most number of energy levels has the highest density.
- R has an outer energy level electron configuration of 3s² 3p¹.
- The products of P₂A and NA₂ are formed when a candle burns.
- E contains 10 protons.
- The electrons of C are distributed over four energy levels.
- The electron configuration of X is the same as that of the ion F⁺¹. (Please note that this refers to the code letter F, not fluorine.)

UNIT 5 - PERIODIC TABLE & PERIODIC LAW

Names:

1							18
	2	13	14	15	16	17	

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PERIODIC TABLE CROSSWORD PUZZLE CLUESACROSS

- has 4 valence electrons and the largest mass in its group
- its electron configuration ends with $3p^4$
- exception to electron configuration rule because of the stability of a filled 3d sublevel
- 1 mole of this element has a mass of 39.10 grams
- noble gas (with 8 valence electrons) with the lowest atomic number
- only gas in Group 15
- exception to electron configuration rule because of the stability of a half-filled 3d sublevel
- heaviest non-radioactive noble gas
- has 76 protons
- alkali metal that has its valence electron in the 5th energy level
- halogen whose ion has the same electron configuration as argon
- named after a very famous scientist and has an atomic number of 99
- lightest metalloid in Group 14
- 6.022×10^{23} atoms of this element have a mass of 24.3 grams
- non-radioactive halogen with highest atomic number
- only noble gas without 8 valence electrons
- Lanthanide Series named after this element
- noble gas with its valence electrons in the 4th energy level
- known to be a poison; will gain 3 electrons to become stable
- "coinage metal" with 2nd largest atomic radius
- 5th period, Group 4
- used in jewelry; 6th period, Group 10
- lightest solid metal
- has the highest atomic number of all elements that do not have any occupied "f" orbitals
- basis for organic chemistry; only true nonmetal in Group 14
- radioactive element in Group 18
- used in light bulb filaments; end of its electron configuration should be $5d^4$
- radioactive element that has 94 electrons when it is a neutral atom
- 2nd lowest ionization energy in Group 15
- largest atomic radius in Group 1; non-radioactive
- its symbol is Mo
- location of this metal would lead us to believe that it is a metalloid

DOWN

- its last electron is the first electron occupying the 4p sublevel
- only gas in Group 1
- has 63 protons; named after a continent
- most electronegative element
- lowest ionization energy of all alkaline earth elements
- its symbol is Nd
- Actinide Series element named after the scientist who arranged Periodic Table by mass
- 10 moles of this element would have a mass of 876.2 grams
- its electron configuration ends with $3d^{10}$
- only liquid metal
- transition element with only 1 completely filled 3d orbital
- makes up 21% of Earth's atmosphere; vital for human life
- solid Group 15 element with the highest electron affinity
- mass of 2 atoms of this element is 117.9 amu
- most common Actinide Series element
- Group 16 element whose ion has the same electron configuration as krypton
- has 2 electrons in its 4s orbital and 1 electron in each 3d orbital
- has 77 protons
- Group 15 element with the lowest electronegativity
- only liquid nonmetal
- alkaline earth metal needed for strong bones and teeth
- Group 17 element with the lowest electron affinity
- 18 grams of this element contains the same number of atoms as 24 grams of carbon
- same name as an American coin
- heaviest noble gas that does not have any electrons in ANY "d" orbital
- lightest metalloid
- 2nd largest atomic radius in Group 14
- heaviest "coinage metal"
- 0.5 moles of this element have a mass of 56.2 grams
- Group 1 element that is a part of common table salt

UNIT 5 - PERIODIC TABLE & PERIODIC LAW

A large crossword puzzle grid with 30 numbered starting points for words. The grid is composed of white squares for letters and grey squares for empty space. The numbers are as follows:

- 1: Down, 10 squares
- 2: Across, 10 squares
- 3: Across, 10 squares
- 4: Down, 10 squares
- 5: Across, 10 squares
- 6: Across, 10 squares
- 7: Down, 10 squares
- 8: Down, 10 squares
- 9: Down, 10 squares
- 10: Across, 10 squares
- 11: Down, 10 squares
- 12: Down, 10 squares
- 13: Down, 10 squares
- 14: Down, 10 squares
- 15: Down, 10 squares
- 16: Down, 10 squares
- 17: Down, 10 squares
- 18: Down, 10 squares
- 19: Down, 10 squares
- 20: Down, 10 squares
- 21: Down, 10 squares
- 22: Down, 10 squares
- 23: Down, 10 squares
- 24: Down, 10 squares
- 25: Down, 10 squares
- 26: Down, 10 squares
- 27: Down, 10 squares
- 28: Down, 10 squares
- 29: Down, 10 squares
- 30: Down, 10 squares

A smaller crossword puzzle grid with 12 numbered starting points for words. The grid is composed of white squares for letters and grey squares for empty space. The numbers are as follows:

- 29: Down, 10 squares
- 30: Down, 10 squares
- 31: Down, 10 squares
- 32: Down, 10 squares
- 33: Down, 10 squares
- 34: Down, 10 squares
- 35: Down, 10 squares
- 36: Down, 10 squares
- 37: Down, 10 squares
- 38: Down, 10 squares
- 39: Down, 10 squares
- 40: Down, 10 squares

