

Good Morning!!

Please take out your PTE, a pencil and a notebook.

Write down 2 things that the Periodic Table of Elements (PTE) tells us about elements.

Atomic Mass

Charges of ions

Energy levels, Orbitals, e⁻ organization

of protons: Atomic

State of matter

Ch. 6: The Periodic Table of Elements

	Group →	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
↑ Period		H																He	
1		1																	
2		3	4																
3		11	12																
4		19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
5		37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	
6		55	56	Ba		72	73	74	75	76	77	78	79	80	81	82	83	84	
7		87	88		104	105	106	107	108	109	110	111	112	113	114	115	116	117	
	Lanthanides	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71			
	Actinides	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103			

Essential Questions

- What information does the Periodic Table provide about atoms?
- Why are the elements arranged in the way that they are?
- What are the trends of the elements of the PTE?

Mendeleev's PTE

ОПЫТЪ СИСТЕМЫ ЭЛМЕНТОВЪ.

ОСНОВАННЫЙ НА ИХЪ АТОМНОМЪ ВЪСЪ И ХИМИЧЕСКОМЪ СХОДСТВѦ.

Ti = 50	Zr = 90	? = 180.
V = 51	Nb = 94	Ta = 182.
Cr = 52	Mo = 96	W = 186.
Mn = 55	Rh = 104, ⁴	Pt = 197, ¹
Fe = 56	Ru = 104, ⁴	Ir = 198.
Ni = Co = 59	Pt = 106, ⁴	O = 199.
H = 1	Cu = 63, ⁴	Ag = 108
Be = 9	Mg = 24	Zn = 65, ⁴
B = 11	Al = 27, ¹	? = 68
C = 12	Si = 28	? = 70
N = 14	P = 31	As = 75
O = 16	S = 32	Se = 79, ⁴
F = 19	Cl = 35, ⁴	Br = 80
Li = 7	Na = 23	K = 39
		Rb = 85, ⁴
		Ca = 40
		Sr = 87, ⁴
		?
		45
		Ce = 92
		?Er = 56
		La = 94
		?Y = 60
		Dy = 95
		?In = 75, ⁴
		Th = 118?
		Tl = 204.
		Cs = 133
		Ba = 137
		Pb = 207.

Mendeleev's PTE: Increasing order of
atomic mass. Why?

The genius of Mendeleev's periodic table

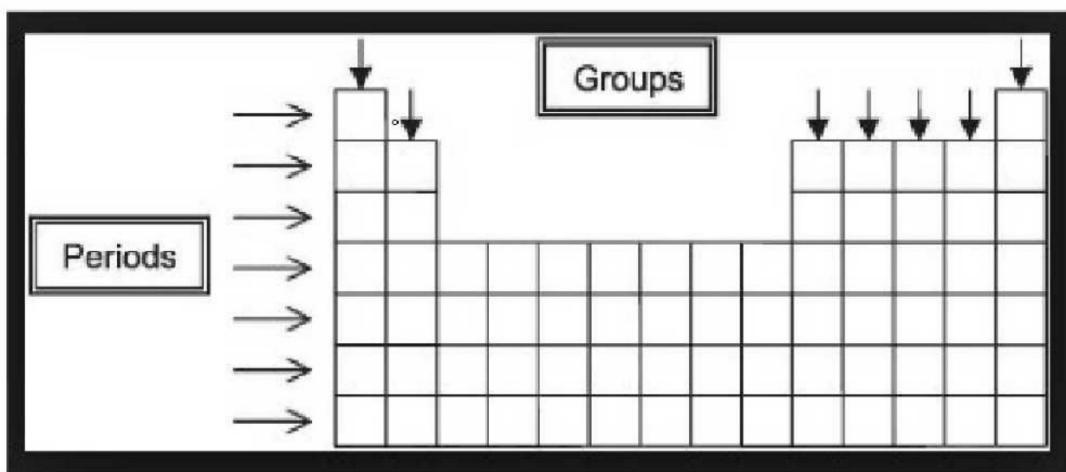
Lou Serico



Periodic Law

- Elements are arranged in order of increasing atomic number.
- There is a **periodic** repetition of physical and chemical properties.

Periods and Groups



Groups of the PTE

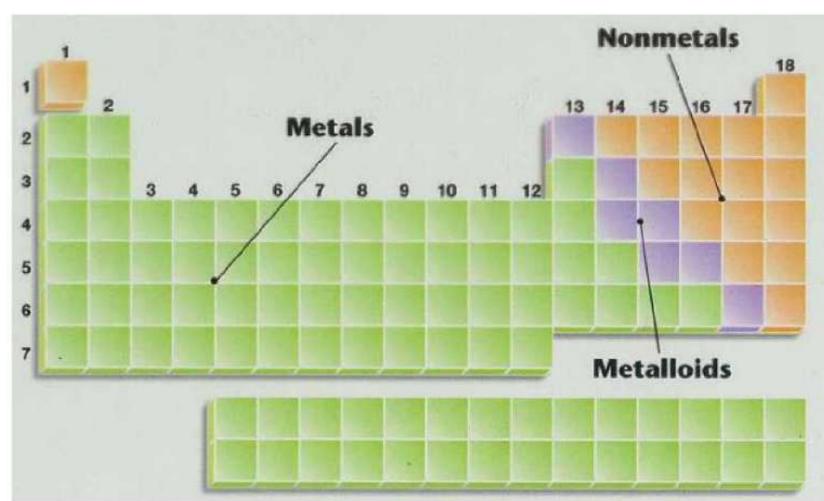
IA 1	IIA 2	alkali metals		post-transition metals										noble gases		VIIA 18	
H	Be	alkaline earths												He		Ne	
Li	Mg	IIIIB	IVB	VIB	VIB	VIB	VIIIB	VIII	VIII	IB	IIB	B	C	N	O	F	
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Al	Si	P	S	Cl	He
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	Ga	Ge	As	Se	Br	Ne
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	In	Sn	Sb	Te	I	Kr
Fr	Ra	Ac	Rf	Db	Sg	Bh	Hs	Mt	Ds			Tl	Pb	Bi	Po	At	Xe
																	Rn
semimetals (metalloids)																	
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	lanthanides			
Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr	actinides			

S.K. Lower

Quick Element



Metals, Non-Metals & Metalloids

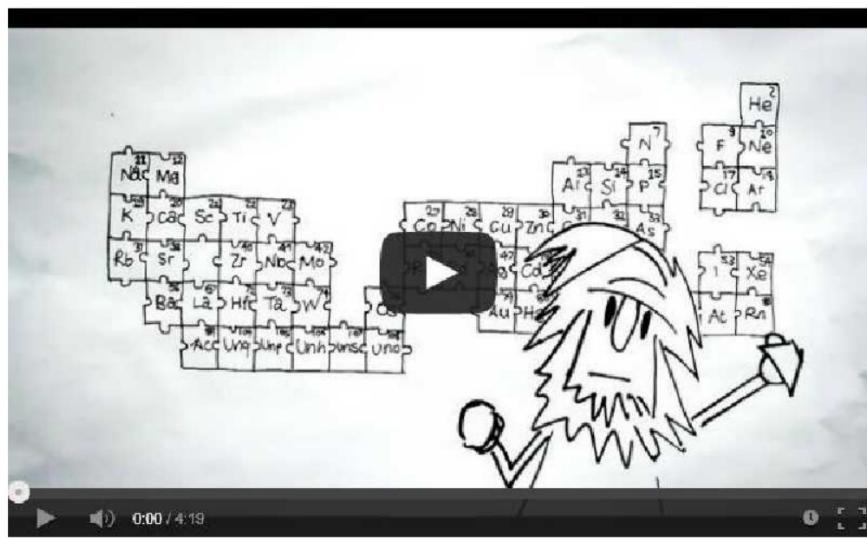


Breish Chemistry

- There are a few supplemental materials on the website.
- Chapter 6 is under the home page.
- See Flipchart.

Solving the puzzle of the periodic table

Eric Rosado

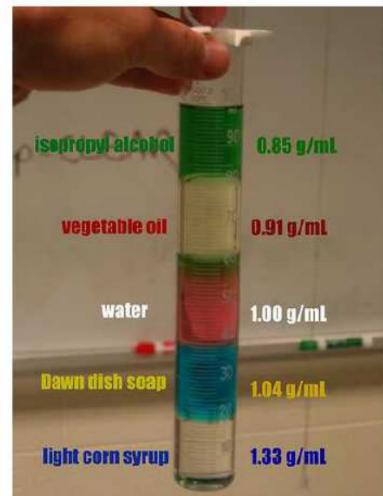


Properties of Elements

- Density
- Atomic Radius
- Melting and Boiling Point
- Ionization Energy
- Electronegativity

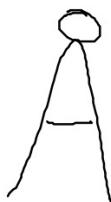
Density

- How much mass is occupied by a particular space.
- Density = mass divided by volume.
- Units: g/ml or g/cm³

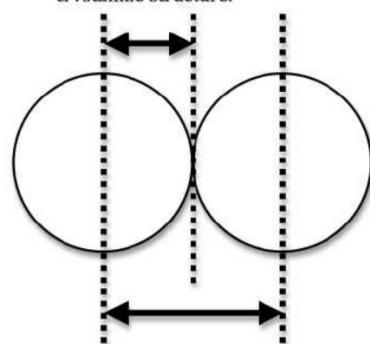


Atomic Radius

- The radius of one atom of an element.



This is the metallic radius. It is $\frac{1}{2}$ the distance between the nuclei of two atoms in a crystalline structure.



This is the distance between the nuclei of two metallic atoms.



ok is okay

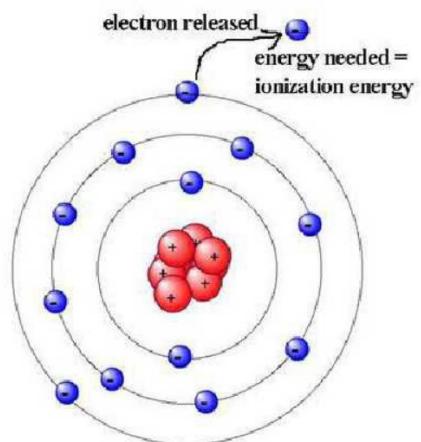
Melting and Boiling Point

- Temperature in Celsius where there is a phase change from solid to liquid and then from liquid to gas.



1st Ionization Energy

- The energy (quanta) needed to remove an electron from a neutral atom.
- Neutral-same number of protons and electrons.



Electronegativity

- The ability of an atom to attract electrons when the atom is in a compound.
- Important for bonding with other atoms.



Periodic Trends Activity

- You will research the properties of different elements.
- You will organize them in excel, graph them, insert the graphs into a word document, and complete the questions about the trends of each property.

