

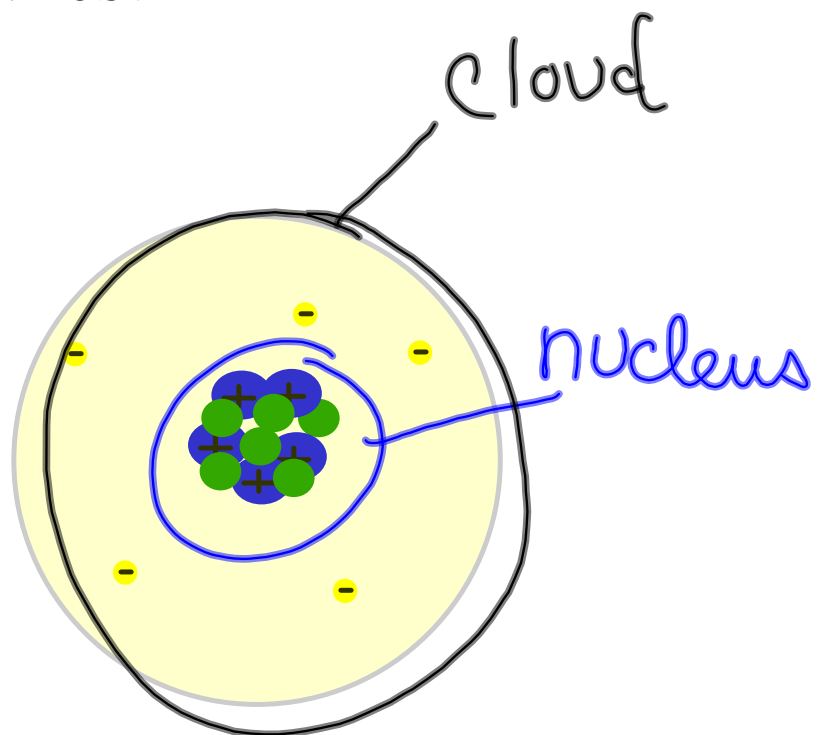
Structure of Matter

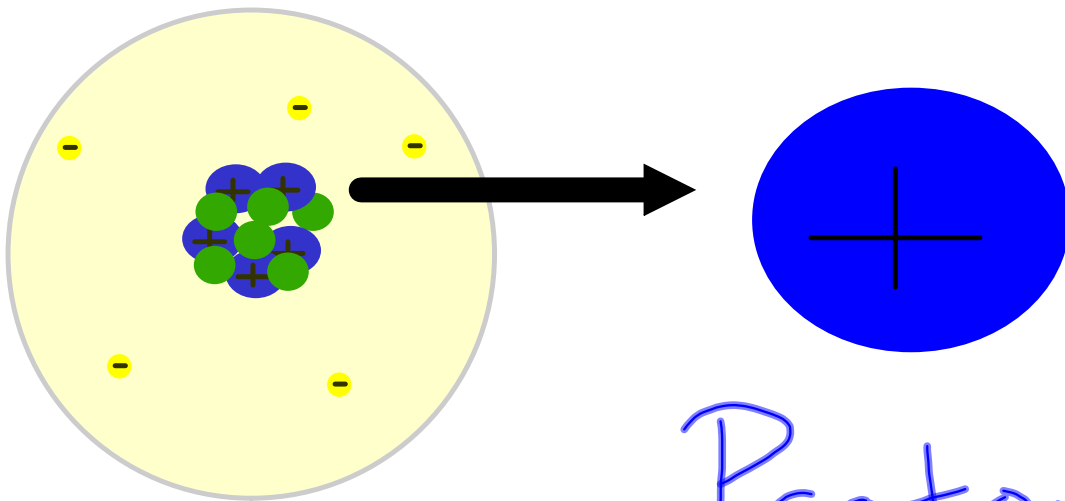
Atomic Theory- all matter is made of up of tiny particles called atoms

Matter- anything that has mass and takes up space.

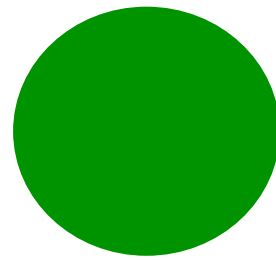
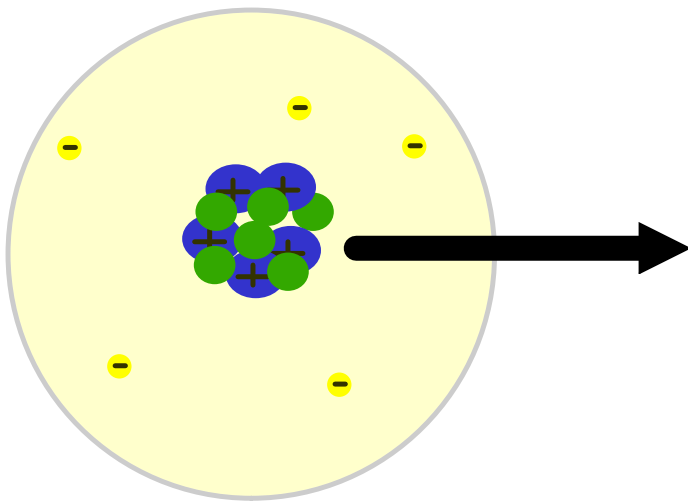
shoes taco
chair
desk
human

Atom- the smallest
unit of matter

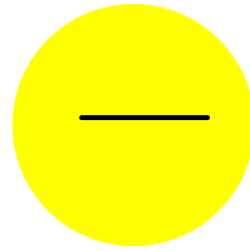
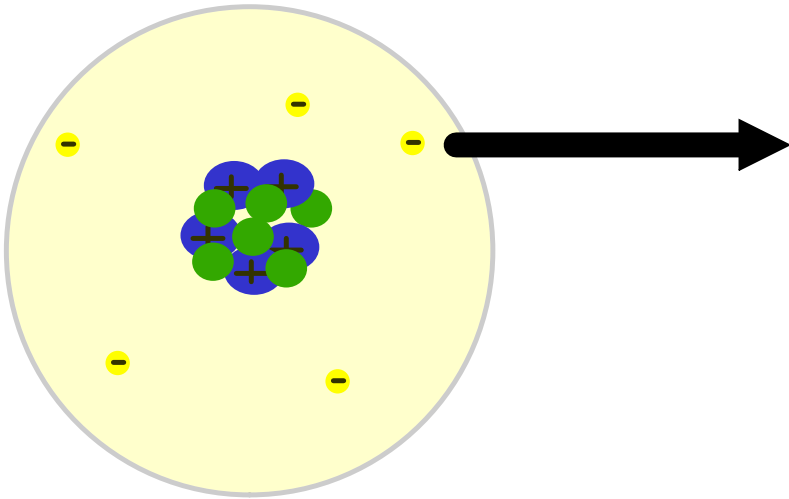




Proton
positive charge



Neutron
neutral
charge

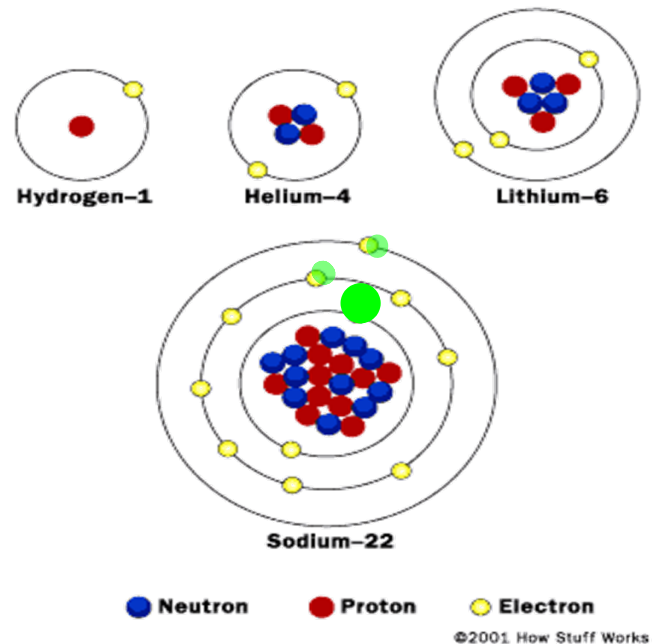


Electron
negative
Charge

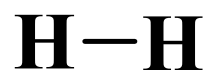
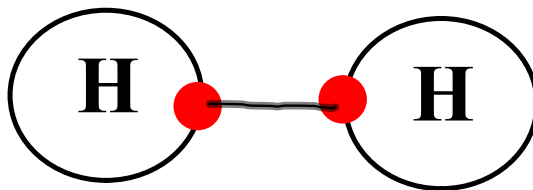
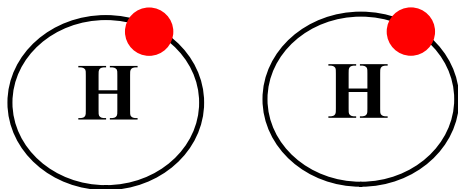
Bohr model of an atom

- Nucleus
 - Protons
 - Neutrons
 - Energy Shells
 - Electrons
 - 2 in the 1st
 - 8 in the 2nd
 - 8 in the 3rd
- Outer shell holds valence electrons

Isotopes of Hydrogen, Helium, Lithium and Sodium

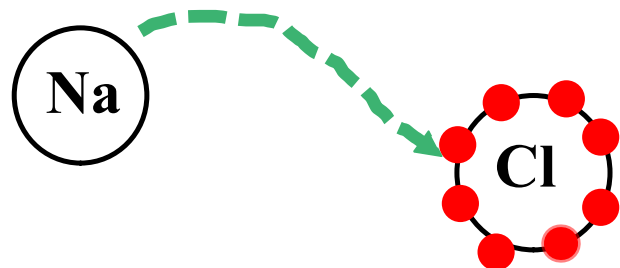
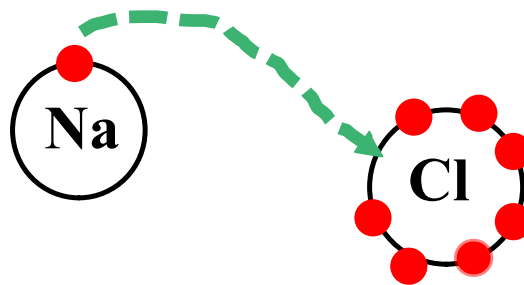


Covalent bond-when two or more elements **share** valence electrons.



Ionic Bonds-transfer of electrons from one atom to another atom.

give + take



What is the atomic number of an atom and how is it determined?

Atomic number- the number of Protons

Atomic Mass- number of protons plus ~~electrons~~ *neutrons*

6	—	Atomic number
C	—	Symbol
Carbon	—	Name
12.0107	—	Average Atomic Mass

Isotopes- atoms of elements that have different numbers of neutrons.

1																2	
3	4											5	6	7	8	9	10
11	12											13	14	15	16	17	18
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
55	56	57	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
87	88	89	104	105	106	107	108	109									

GROUPS

Periods

58	59	60	61	62	63	64	65	66	67	68	69	70	71
90	91	92	93	94	95	96	97	98	99	100	101	102	103

1 A L K A L I N E M E T A L S																	2 N O B L E G A S E S						
3 K	4 A L K A L I N E M E T A L S																	5 H	6 A	7 L	8 O	9 H A L O G E N S	10 N O B L E G A S E S
11 L	12 I																	13 C	14 N	15 O	16 F	17 S	18 E
19 M	20 E	21	22	23	24	25	26	27	28	29	30	31 C	32 N	33 O	34 F	35 S	36 E						
37 T	38 A	39	40	41	42	43	44	45	46	47	48	49 C	50 N	51 O	52 F	53 S	54 E						
55 A	56 R	57	72	73	74	75	76	77	78	79	80	81 C	82 N	83 O	84 F	85 S	86 E						
87 S	88 H	89	104	105	106	107	108	109															

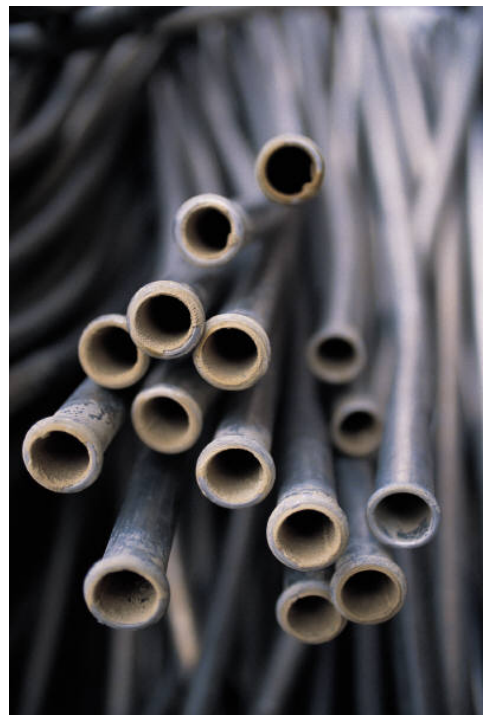
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90	91	92	93	94	95	96	97	98	99	100	101	102	103

Metals

- shiny or metallic luster
- good heat conductor

- ductile

- malleable, shapeable



Some metals have
a white color because
they react with the air.



Non-metals

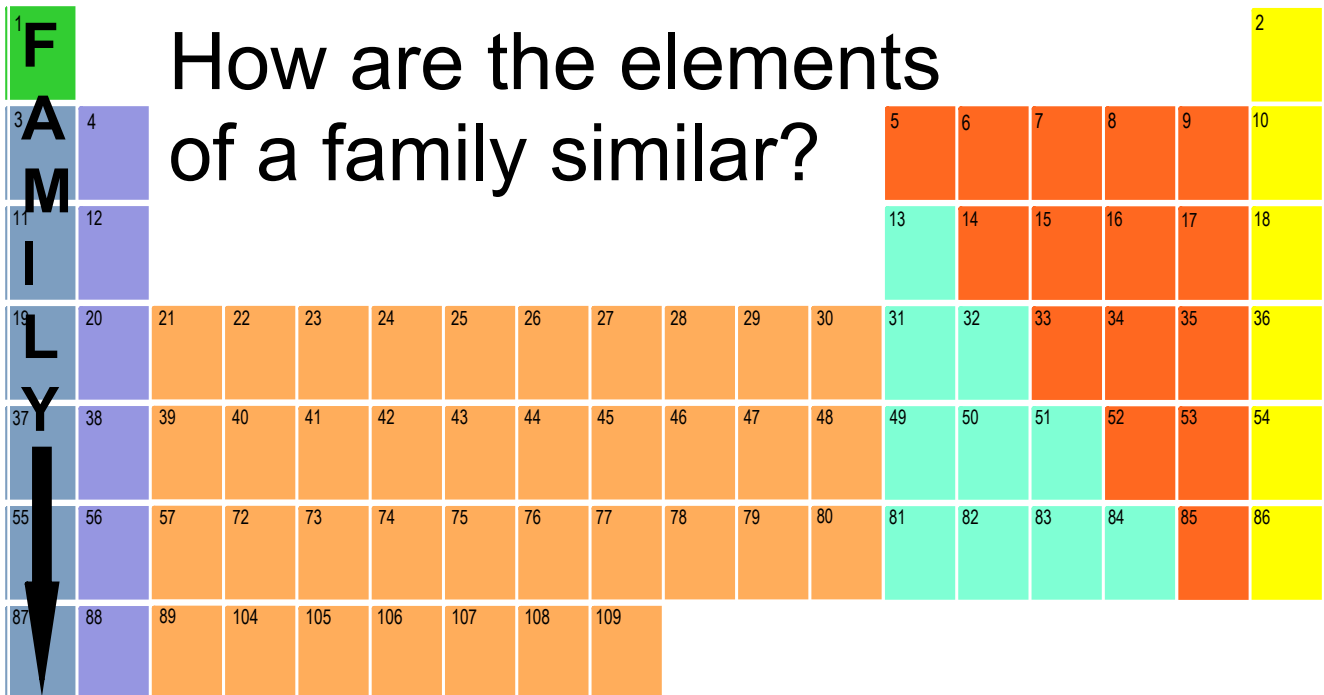
- not good heat conductors
- brittle break easy
- dull
- not shiny



Metalloids-properties of metals and nonmetals

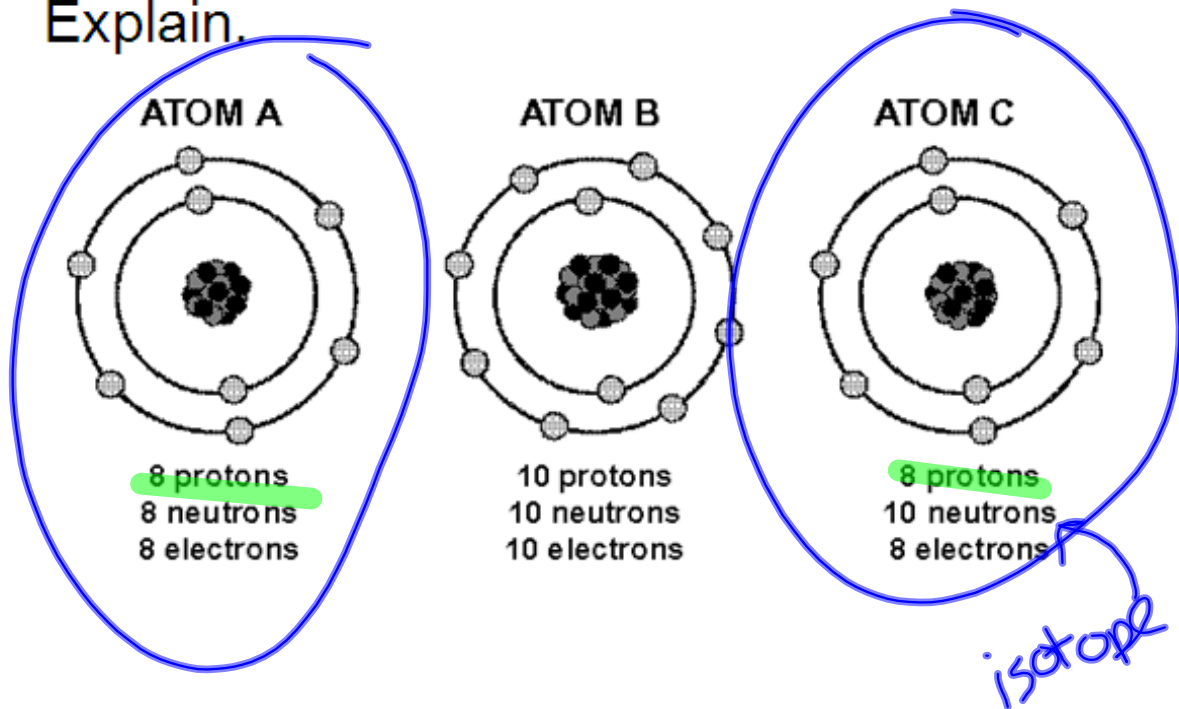
Many times used as a semiconductor for electricity at high temps.

Questions



58	59	60	61	62	63	64	65	66	67	68	69	70	71
90	91	92	93	94	95	96	97	98	99	100	101	102	103

- Do any of the atom diagrams below represent atoms of the same element? Explain.

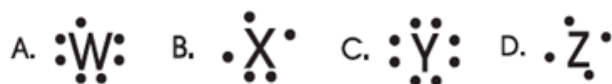


Partial Periodic Table of the Elements

1 IA H Hydrogen 1.00794	2 IIA He Helium 4.0026						
3 Li Lithium 6.941	4 Be Beryllium 9.0122	5 B Boron 10.811	6 C Carbon 12.0107	7 N Nitrogen 14.0067	8 O Oxygen 15.9994	9 F Fluorine 18.9984	10 Ne Neon 20.1797
11 Na Sodium 22.9898	12 Mg Magnesium 24.3050	13 Al Aluminum 26.98154	14 Si Silicon 28.0855	15 P Phosphorus 30.9738	16 S Sulfur 32.065	17 Cl Chlorine 35.4527	18 Ar Argon 39.948
19 K Potassium 39.0983	20 Ca Calcium 40.078						

Note: In the original image, the numbers 17 and 18 are circled in blue, and a green arrow points from the circled 17 down to the VIIA column header.

Suppose scientists discovered four new elements (W, X, Y, Z) while studying rock and soil samples brought back from a Mars mission. Which Lewis dot structure represents an element that should be placed in column VIIA (17) of the periodic table?



Partial Periodic Table of the Elements								VIII 18
1	IA 1 1 H Hydrogen 1.00794							2 He Helium 4.0026
2	3 Li Lithium 6.941	IIA 2 4 Be Beryllium 9.0122	IIIA 13 5 B Boron 10.811	IVA 14 6 C Carbon 12.0107	VA 15 7 N Nitrogen 14.0067	VIA 16 8 O Oxygen 15.9994	VIIA 17 9 F Fluorine 18.9984	10 Ne Neon 20.1797
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4	19 K Potassium 39.0983	20 Ca Calcium 40.078						

14

A neutral atom of silicon has

- A. 12 electrons.
- B. 13 electrons.
- C. 14 electrons.
- D. 15 electrons.