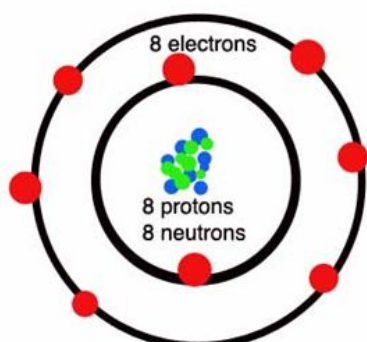


## Bohr Diagrams VS. Lewis Dot Diagrams:

Both diagrams represent electrons

### Bohr Diagram

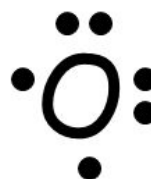
- Shows ALL electrons
- Draw electron shells



How do you find the total number of electrons?

### Lewis Dot

- ▶ Shows ONLY valence electrons
- ▶ Do NOT draw any shells



How do you find the number of valence electrons?

## Lesson 3-Bohr and Lewis Diagrams

1. Draw the nucleus as a solid circle.
2. Put the number of protons (atomic number) in the nucleus with the number of neutrons (atomic mass – atomic number) under it.
3. Place the number of electrons (same as protons) in the electron clouds around the nucleus by drawing circles around the nucleus.

1st shell – 2 electrons,

2nd shell – 8 electrons,

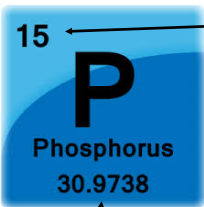
3rd shell - 18 electrons

$n = \text{shell number} \# \text{ of electrons} = 2(n^2)$

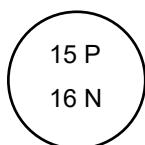
Periods (rows) = # of electron clouds (outer cloud - valence cloud)

Groups (columns) = # of valence electrons

## Lesson 3-Bohr and Lewis Diagrams

	<p>atomic number=number of protons</p> <p># of protons = 15</p> <p># of neutrons = mass number - protons 31-15=16</p> <p>There are 16 neutrons</p>
<p>mass number</p>	

1. Draw the nucleus as a solid circle.
2. Put the number of protons (atomic number) in the nucleus with the number of neutrons (atomic mass – atomic number) under it.

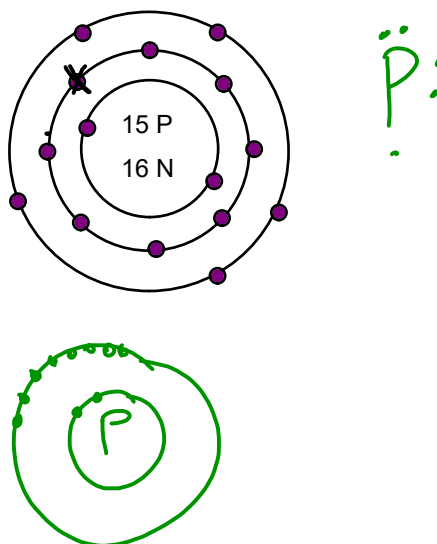


3. Place the number of electrons (same as protons) in the electron clouds around the nucleus by drawing circles around the nucleus.

1st shell – 2 electrons,  
2nd shell – 8 electrons,  
3rd shell - 18 electrons

Periods (rows) = # of electron clouds circles  
P is in the 3rd row, therefore 3 circles must be drawn.

Groups (columns) = # of valence electrons (outer circle)



# Lesson 3-Bohr and Lewis Diagrams

## Periodic Table of the Elements

**Legend:**

- Alkali metals
- Alkaline earth metals
- Lanthanides
- Actinides
- Transition metals
- Unknown properties
- Post-transition metals
- Metalloids
- Other nonmetals
- Halogens
- Noble gases

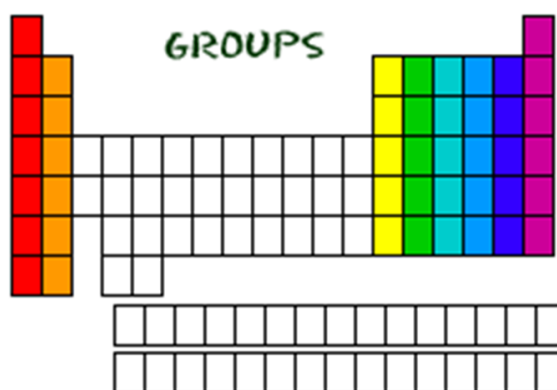
Group	1	2											13	14	15	16	17	18	
Period	1A	2A	3B	4B	5B	6B	7B	8B	9B	10B	11B	12B	3A	4A	5A	6A	7A	8A	
1	H Hydrogen 1.0078																	He Helium 4.0026	
2	Li Lithium 6.938	Be Beryllium 9.0122											B Boron 10.806	C Carbon 12.009	N Nitrogen 14.006	O Oxygen 15.999	F Fluorine 18.998	Ne Neon 20.180	
3	Na Sodium 22.990	Mg Magnesium 24.305											Al Aluminum 26.982	Si Silicon 28.084	P Phosphorus 30.974	S Sulfur 32.059	Cl Chlorine 35.446	Ar Argon 39.948	
4	K Potassium 39.098	Ca Calcium 40.078	Sc Scandium 44.956	Ti Titanium 47.867	V Vanadium 50.942	Cr Chromium 51.996	Mn Manganese 54.938	Fe Iron 55.845	Co Cobalt 58.933	Ni Nickel 58.693	Cu Copper 63.546	Zn Zinc 65.38	Ga Gallium 69.723	Ge Germanium 72.63	As Arsenic 74.922	Se Selenium 78.96	Br Bromine 79.904	Kr Krypton 83.798	
5	Rb Rubidium 85.468	Sr Strontium 87.62	Y Yttrium 88.906	Zr Zirconium 91.224	Nb Niobium 92.906	Mo Molybdenum 95.96	Tc Technetium 98.9062	Ru Ruthenium 101.07	Rh Rhodium 101.07	Pd Palladium 106.42	Ag Silver 107.87	Cd Cadmium 112.41	In Indium 114.82	Sn Tin 118.71	Sb Antimony 121.76	Te Tellurium 127.60	I Iodine 126.90	Xe Xenon 131.29	
6	Cs Cesium 132.91	Ba Barium 137.33		Hf Hafnium 178.49	Ta Tantalum 180.95	W Tungsten 183.84	Re Rhenium 186.21	Os Osmium 190.23	Ir Iridium 192.22	Pt Platinum 195.08	Au Gold 196.97	Hg Mercury 200.59	Tl Thallium 204.38	Pb Lead 207.2	Bi Bismuth 208.98	Po Polonium (209)	At Astatine (210)	Rn Radon (222)	
7	Fr Francium (223)	Ra Radium (226)		Rf Rutherfordium (261)	Db Dubnium (262)	Sg Seaborgium (266)	Bh Bohrium (264)	Hs Hassium (269)	Mt Meitnerium (268)	Ds Darmstadtium (268)	Rg Roentgenium (268)	Cn Copernicium (268)	Uut Ununtrium (268)	Fl Flerovium (268)	Uup Ununpentium (268)	Lv Livermorium (268)	Uus Ununseptium (268)	Uuo Ununoctium (268)	
			Lanthanides																
			57	58	59	60	61	62	63	64	65	66	67	68	69	70	71		
			La Lanthanum 138.91	Ce Cerium 140.12	Pr Praseodymium 140.91	Nd Neodymium 144.24	Pm Promethium (145)	Sm Samarium 150.36	Eu Europium 151.96	Gd Gadolinium 157.25	Tb Terbium 158.93	Dy Dysprosium 162.50	Ho Holmium 164.93	Er Erbium 167.26	Tm Thulium 168.93	Yb Ytterbium 173.04	Lu Lutetium 174.97		
			89	90	91	92	93	94	95	96	97	98	99	100	101	102	103		
			Ac Actinium (227)	Th Thorium 232.04	Pa Protactinium 231.04	U Uranium 238.03	Np Neptunium (237)	Pu Plutonium (244)	Am Americium (243)	Cm Curium (247)	Bk Berkelium (247)	Cf Californium (251)	Es Einsteinium (252)	Fm Fermium (257)	Md Mendelevium (258)	No Nobelium (259)	Lr Lawrencium (262)		

## Practice Drawing Bohr Diagrams

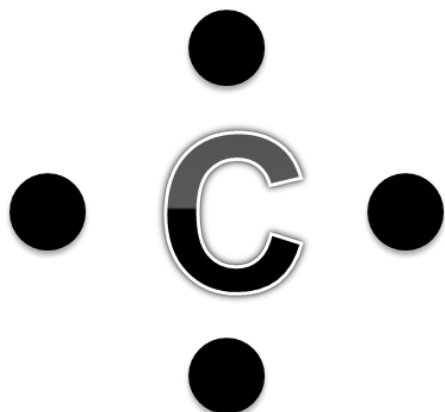
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## Lewis Dot Diagrams

- Find out which group (column) your element is in.
- This will tell you the number of valence electrons your element has.
- You will only draw the valence electrons.

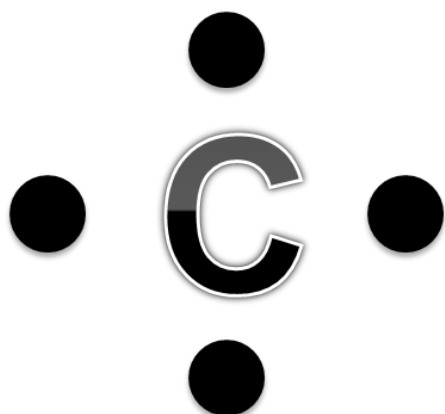


## Lesson 3-Bohr and Lewis Diagrams



- Write the element symbol.
- Carbon is in the 4<sup>th</sup> group, so it has 4 valence electrons.
- Starting at the right, draw 4 electrons, or dots, counter-clockwise around the element symbol.

### Lesson 3-Bohr and Lewis Diagrams



- Check your work.
- Using your periodic table, check that Carbon is in the 4<sup>th</sup> group.
- You should have 4 total electrons, or dots, drawn in for Carbon.



## Lesson 3-Bohr and Lewis Diagrams

On a piece of paper, try these elements on your own:

- H
- P
- Ca
- Ar
- Cl
- Al

Lesson 3-Bohr and Lewis Diagrams

