

Atomic Basics

Name _____

Part A: Atomic Structure

1. Place five protons (blue marbles) in the nucleus of the atom.
2. Place six neutrons (red marbles) in the nucleus of the atom.
3. Place two electrons in the first energy level.
4. Place three electrons in the second energy level
5. What element is represented by the atom board?

Part B: Atomic Calculations

6. Label the information provided in the periodic table.

A rectangular box representing a periodic table entry for Oxygen. Inside the box, from top to bottom, are: the atomic number '8', the chemical symbol 'O', the element name 'Oxygen', and the atomic mass '15.999'. Four horizontal arrows point from the right side of the box to the right, each starting from one of the four pieces of information and pointing to a blank line for labeling.

7. What does the atomic number represent? _____ or _____

8. What does the atomic mass represent? _____ + _____

9. How would you figure the number of protons or electrons in an atom?

10. How would you figure the number of neutrons in an atom?

11. Use your knowledge of atomic calculations to complete the chart.

Element	Atomic Number	Atomic Mass	Protons	Neutrons	Electrons
Li	3	7			
P	15	31			
Cl		35	17		
Ni	28			31	
K		39			19
Ag	47			61	
H		1	1		
Si				14	14
W			74	110	
Ne				10	10

Part C: Electron Configuration

12. Look at your atom board. How many electrons can each level hold?

1st = _____ 2nd = _____ 3rd = _____

13. What term is used for the electrons in the outermost shell or energy level?

14. Scientists use two types of diagrams to show the electron configuration for atoms.

Sulfur

Atomic # = 16

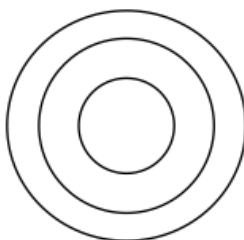
Atomic Mass = 32

Protons = _____

Neutrons = _____

Electron = _____

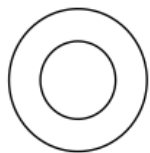
Bohr Diagram
Shows all electrons



Lewis Structure
Shows valence electrons

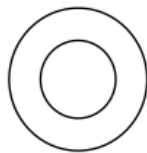
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15. Calculate the missing information and then draw the Bohr Diagram and Lewis Structure for each element.



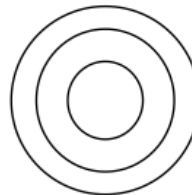
Atomic # = 3
Mass # = 7
of P = ____
of N = ____
of E = ____

Li



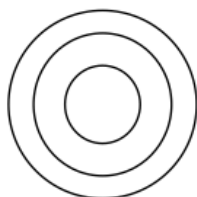
Atomic # = 10
Mass # = 20
of P = ____
of N = ____
of E = ____

Ne



Atomic # = 12
Mass # = 24
of P = ____
of N = ____
of E = ____

Mg



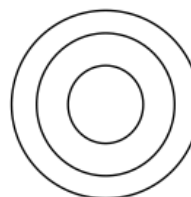
Atomic # = 17
Mass # = 35
of P = ____
of N = ____
of E = ____

Cl



Atomic # = 2
Mass # = 4
of P = ____
of N = ____
of E = ____

He



Atomic # = 14
Mass # = 28
of P = ____
of N = ____
of E = ____

Si

16. Answer the questions below based on the elements in question #15.

(1) Which elements had a filled outermost shell? _____

(2) Which element would be most likely to lose electrons in a chemical bond? _____

(3) Which element would be most likely to gain electrons in a chemical bond? _____

(4) Which elements are not likely to bond with other elements? _____

Why? _____