

Valence Electrons

Valence electrons are the outer most electrons. These are the electrons that are used in bonding and in chemical reactions. The number of valence is the same for all the elements in the same column.

Column 1A	1 valence electron
Column 2A	2 valence electrons
Column 3A	3 valence electrons
Column 4A	4 valence electrons
Column 5A	5 valence electrons
Column 6A	6 valence electrons
Column 7A	7 valence electrons
Column 8A	8 valence electrons

The first symbol in the column is **H**
The first symbol in the column is **Be**
The first symbol in the column is **B**
The first symbol in the column is **C**
The first symbol in the column is **N**
The first symbol in the column is **O**
The first symbol in the column is **F**
The first symbol in the column is **He**,
however He is an exception and it only has 2 electrons

Determine how many valence electrons are in the following elements

- | | | | |
|----------------|-------|--------------|-------|
| 1. Fluorine | _____ | 11. Lithium | _____ |
| 2. Phosphorous | _____ | 12. Zinc | _____ |
| 3. Calcium | _____ | 13. Carbon | _____ |
| 4. Nitrogen | _____ | 14. Iodine | _____ |
| 5. Iron | _____ | 15. Oxygen | _____ |
| 6. Argon | _____ | 16. Barium | _____ |
| 7. Potassium | _____ | 17. Aluminum | _____ |
| 8. Helium | _____ | 18. Hydrogen | _____ |
| 9. Magnesium | _____ | 19. Xenon | _____ |
| 10. Sulfur | _____ | 20. Copper | _____ |

Lewis Dot Structures

Lewis dot structures are a way of representing atoms using the element's symbol and dots to represent the **valance electrons**. Valance electrons are the electrons that are gained, lost or shared when an atom reacts; these are the outer most electrons. The remainder of the atom, the nucleus and other (inner) electrons, is called the **core**.

Rules for writing Lewis dot structures

1. Write the symbol of the element to represent the core.
2. Assign a maximum of 2 electrons to each of the four sides of the symbol to give a total of 8 electrons around the symbol. A dot represents a single electron.
3. Arrange the valance electrons around the four sides of the symbol with one electron assigned to each side up to a maximum of four electrons. Do not exceed the number of actual valance electrons.
4. If needed, pair up electrons on the four sides, up to a maximum of 8 electrons. Do not exceed the number of actual valance electrons.

Draw the Lewis dot structures for the following atoms

Element	Number of Valence Electrons	Lewis Structure
Hydrogen	1	
Helium	2	
Lithium	1	
Beryllium	2	
Boron	3	
Carbon	4	
Nitrogen	5	
Oxygen	6	
Fluorine	7	
Neon	8	
Sodium	1	
Magnesium	2	

Element	Number of Valence Electrons	Lewis Structure
Aluminum	3	
Silicon	4	
Phosphorous	5	
Sulfur	6	
Chlorine	7	
Argon	8	
Potassium	1	
Calcium	2	

More Lewis Dot Structures

Given the name of the element you must determine the number of valence electrons and draw the Lewis dot structure.

1. Barium
2. Tin
3. Argon
4. Gallium
5. Bromine
6. Carbon
7. Krypton
8. Selenium
5. Phosphorous
10. Strontium