



# Chapter 1

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## Atomic Structure and Chemical Bonds



1 -1 Why do atoms combine ?

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# Atomic Structure

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- Atom Size and Structure
  - Imagine Heinz Field...
    - If the nucleus was the size of a paper clip, the nearest electron would be in the furthest seat.
  - Most of the atom is empty space



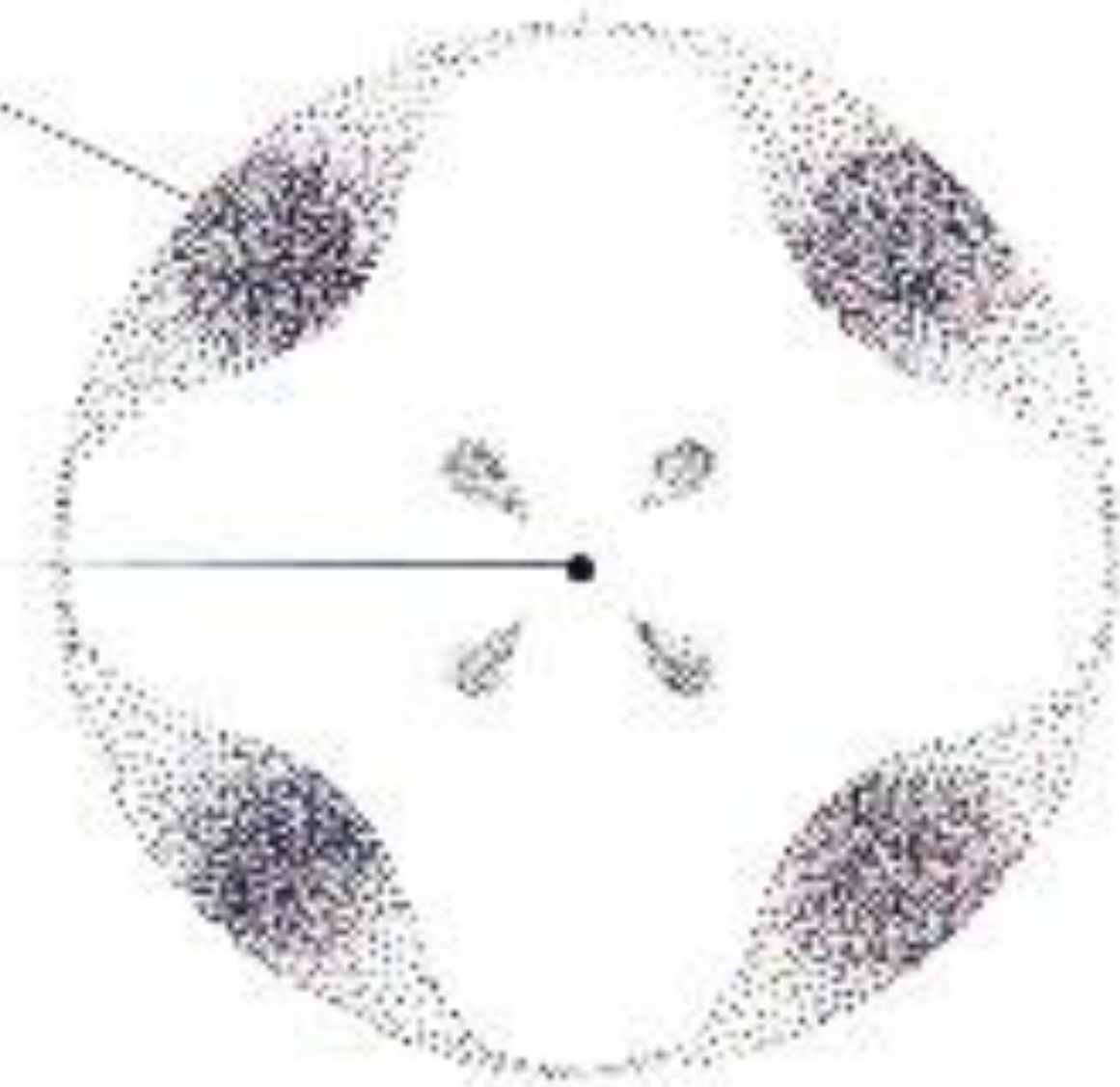
# Electron Cloud

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- The nucleus contains the protons and the neutrons.
- The electrons are found outside the nucleus in the electron cloud.

Electron cloud

Nucleus

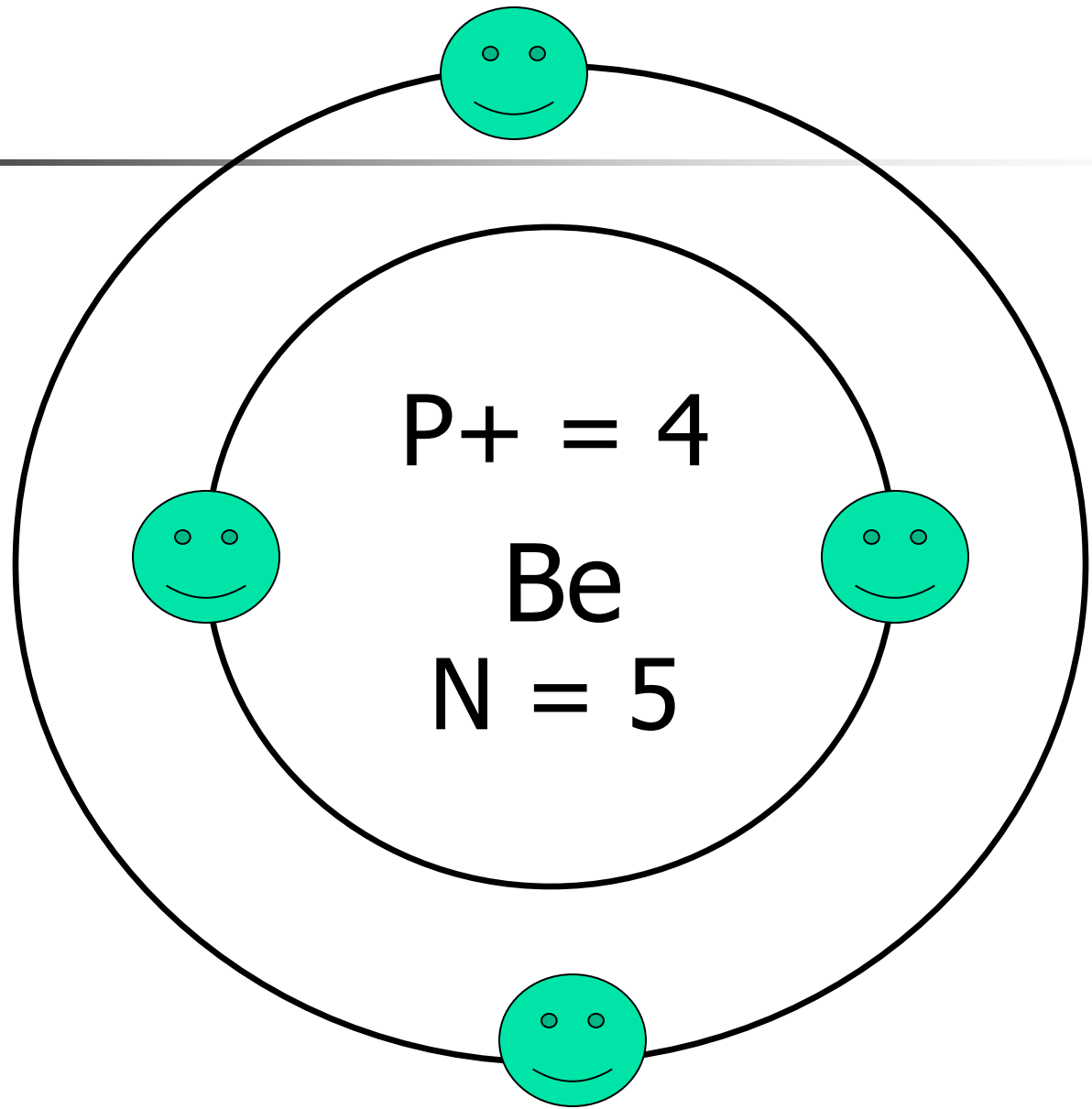


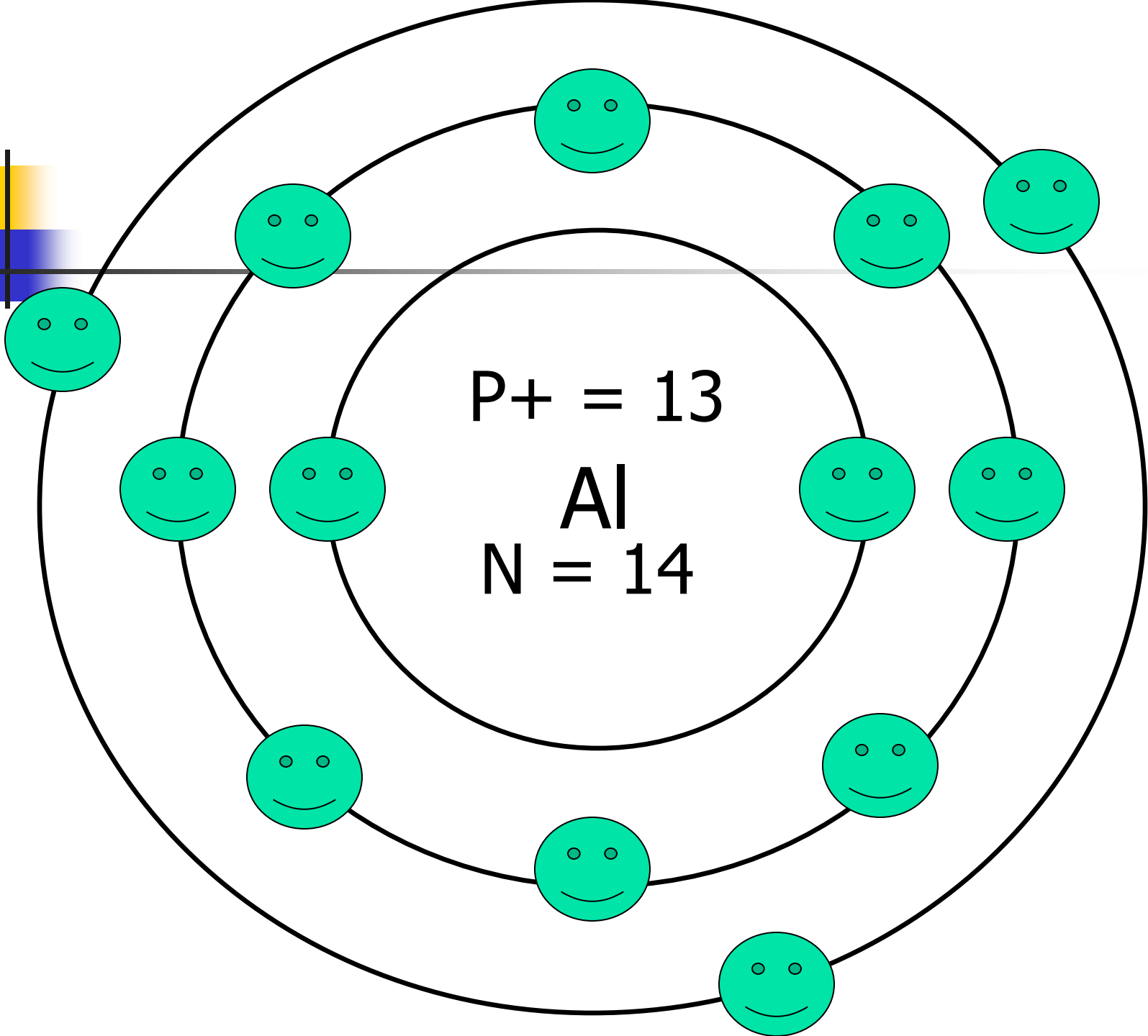
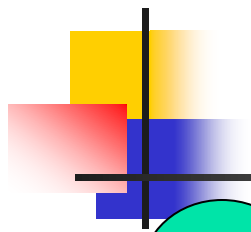


# Energy Levels

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<u>Energy Level</u>	<u># of Electrons</u>
1	2
2	8
3	18
4	32





$P+ = 13$

AI

$N = 14$



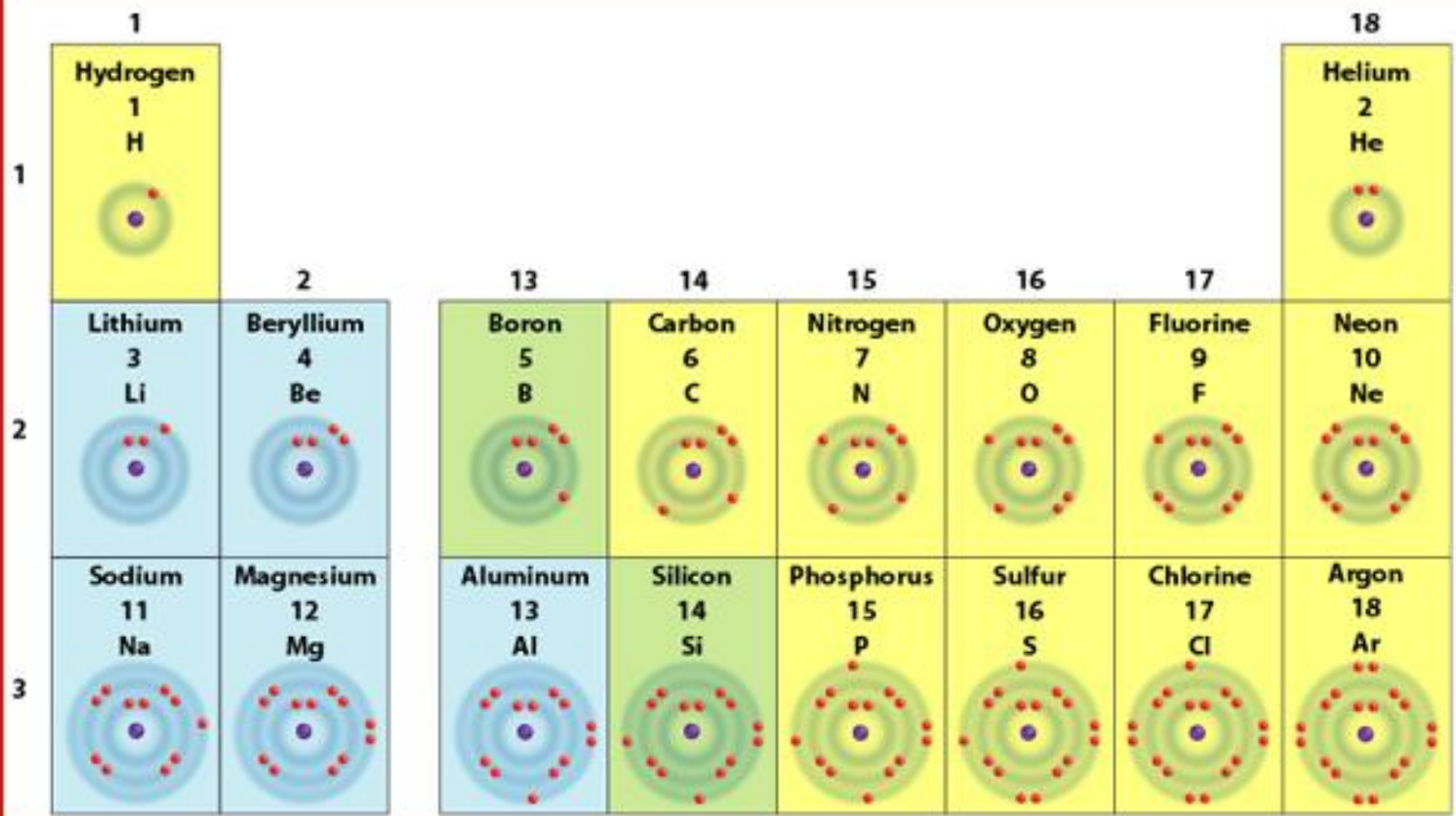




# Electron Energy

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- The electrons in the first energy level have the lowest amount of energy.
- The electrons in the furthest energy level (valence electrons ) have the most energy.
  - The valence electrons are the easiest to remove.





# Noble Gases

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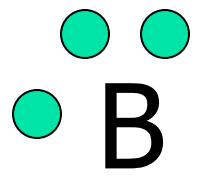
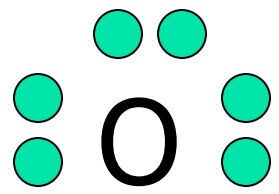
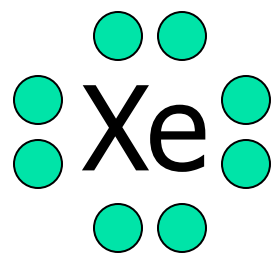
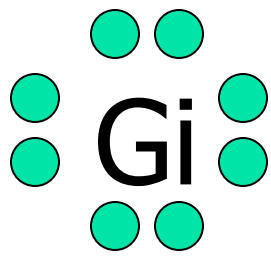
- They either have a full outer energy level or have 8 valence electrons making them Stable.
  - They have 8 electrons making them stable.
  - Helium is the exception only having 2 electrons.



# Electron Dot Diagrams

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1. The symbol of the element.
2. Surrounded by the number of valence electrons.
  - The dots are written in pairs around the four sides of the element symbol.





# Chemical Bonds

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- Chemical Bonds – the force that holds two atoms together.
- Atoms bond so that they can become stable
  - Their outer energy levels become full.