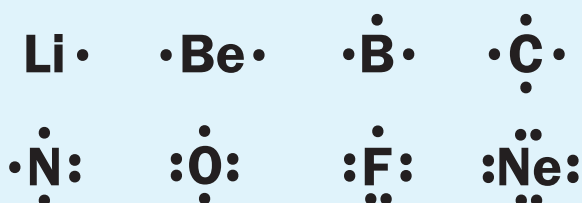


**CONCEPT** Electron dot diagrams are diagrams that show valence electrons in the atoms of an element as dots.

### Elements in each Group (Dot Diagram)



### EXAMPLE

Valence electrons are the electrons in the highest occupied energy level of an element's atoms. The number of valence electrons determines the chemical properties of an element.

## BACKGROUND

At the beginning of the 20th century, an American physical chemist G. N. Lewis (1875–1946) devised a system of symbols—now called Lewis electron dot symbols—that can be used for predicting the number of bonds formed by most elements in their compounds. Each Lewis dot symbol consists of the chemical symbol for an element surrounded by dots that represent its valence electrons.

## REAL WORLD CONNECTIONS

Today we don't give any thought to long-distance communication. Turn on your cell phone and you can instantly talk to almost anyone in the world via short-hand text message (LOL, OMW, HRU). More than 100 years ago, it was a very different matter. Devices were invented that allowed very simple signals to be sent, such as Morse code. A short impulse was called a dot and a longer impulse was called a dash. Symbols and abbreviations are widely used in everyday life.

Same is true for dot diagrams. Dot Diagrams are a useful convention for indicating covalent bonds between atoms in a molecule. These dots do help us understand the sharing of electrons in a way that is much simpler and easy to deal with than other approaches.

1 H		
3 Li	4 Be	
11 Na	12 Mg	
19 K		21 Sc