

## 2.1 Atoms, Ions, and Molecules

### KEY CONCEPT

**All living things are based on atoms and their interactions.**

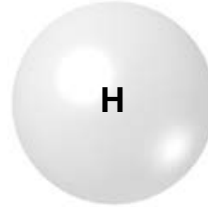


## 2.1 Atoms, Ions, and Molecules

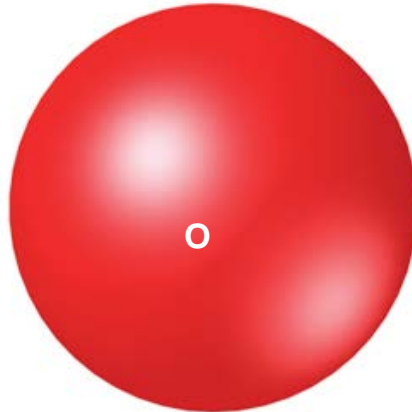
### ▶ Living things consist of atoms of different elements.

- An atom is the smallest basic unit of matter.
- An element is one type of atom.

Hydrogen atom (H)

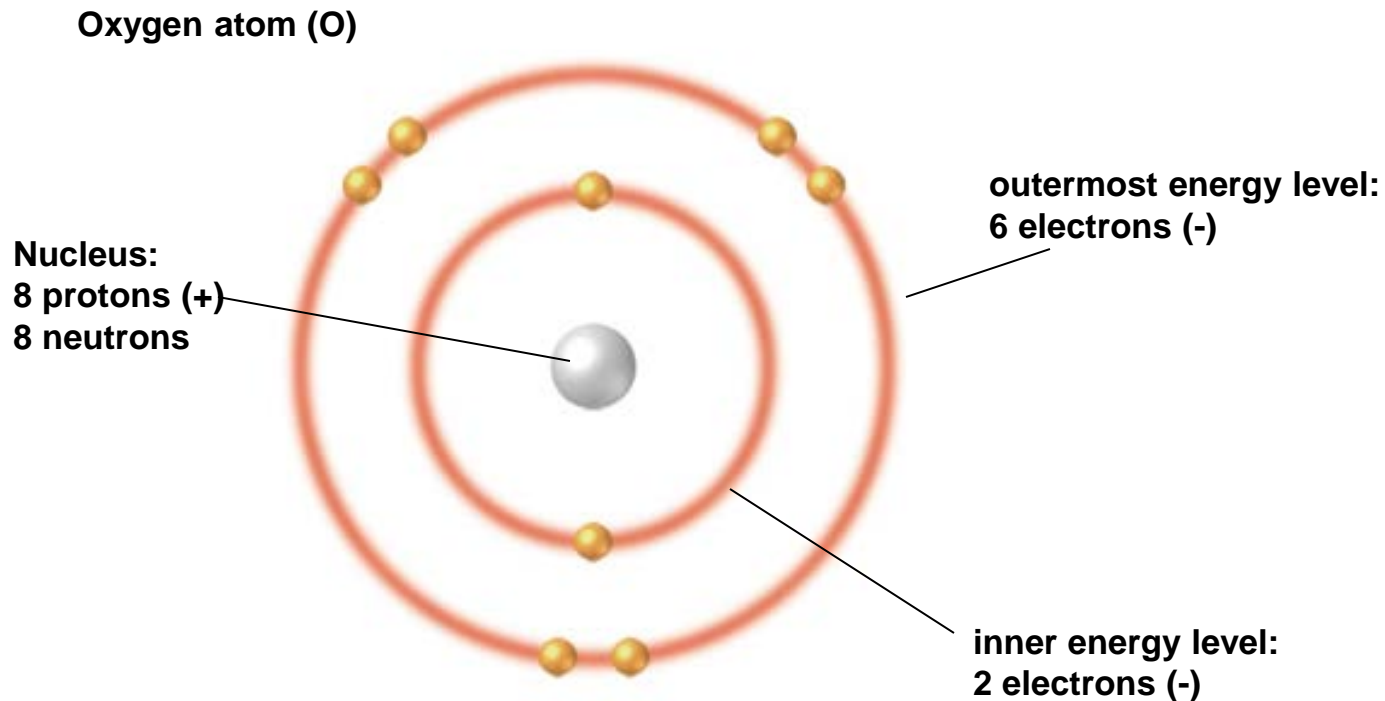


Oxygen atom (O)



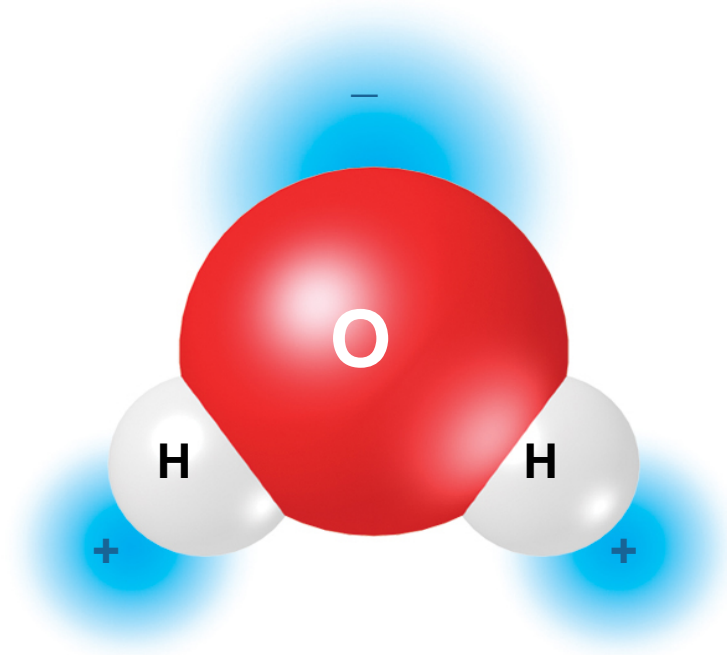
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- An atom has a nucleus and electrons.
  - The nucleus has protons and neutrons.
  - Electrons are in energy levels outside nucleus.



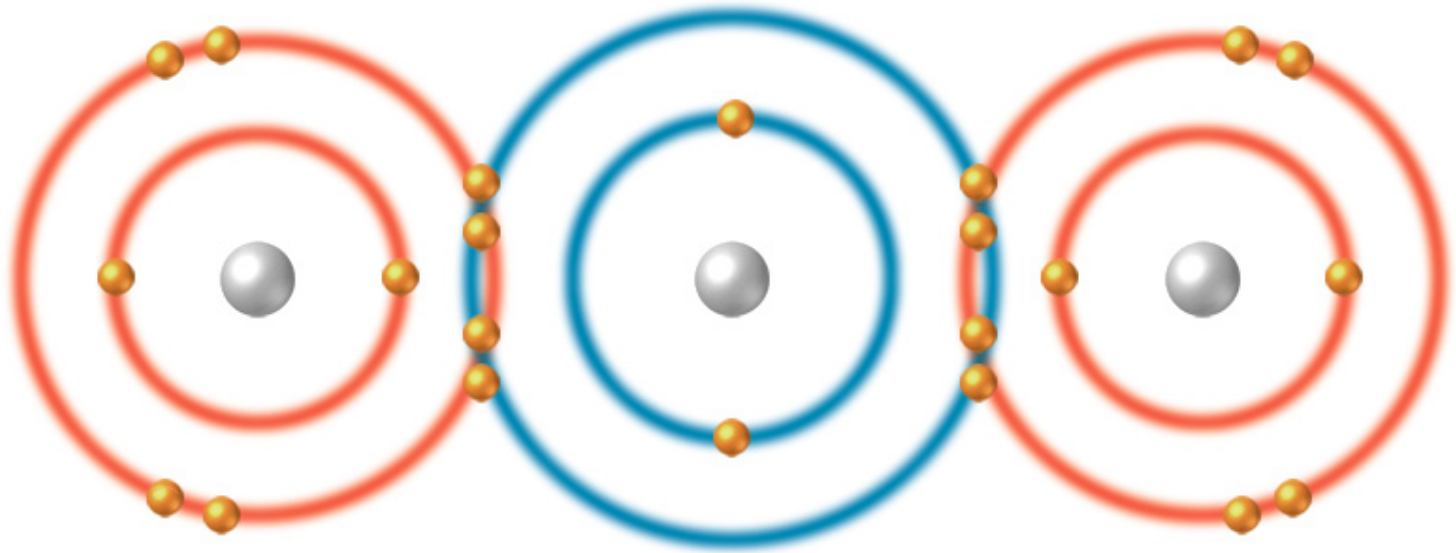
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- A compound is made of atoms of different elements bonded together.
  - water ( $\text{H}_2\text{O}$ )



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  - carbon dioxide ( $\text{CO}_2$ )





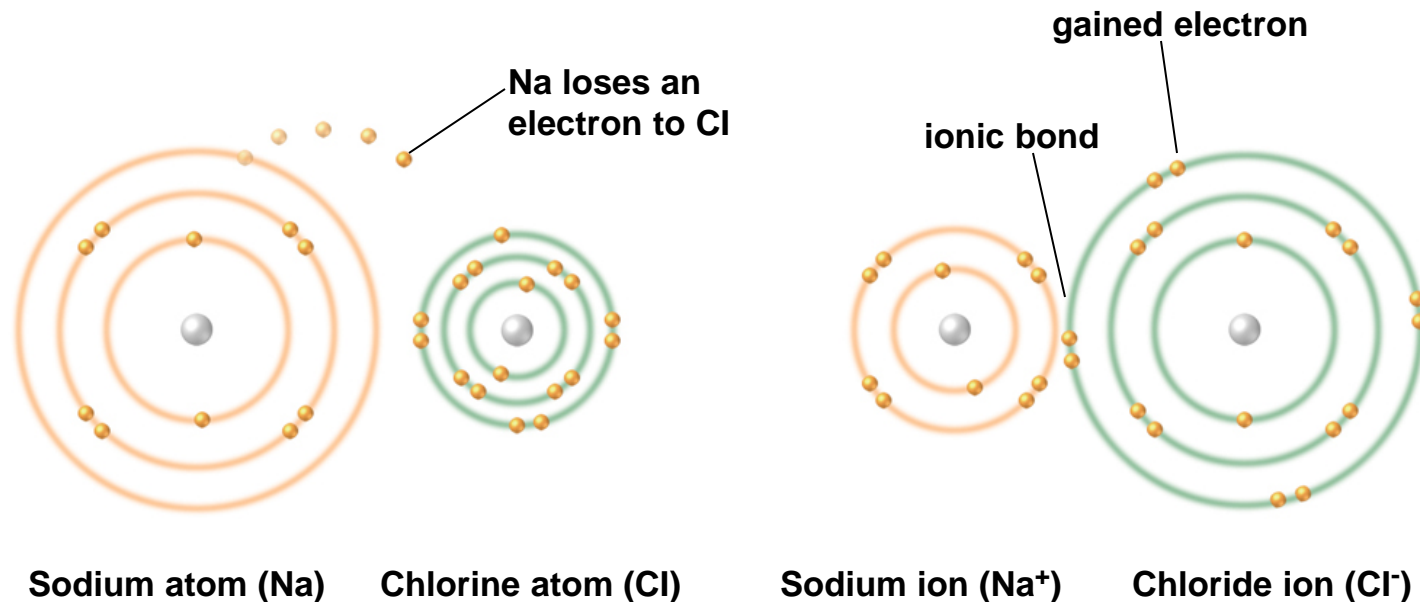
## 2.1 Atoms, Ions, and Molecules

- A compound is made of atoms of different elements bonded together.
  - water ( $\text{H}_2\text{O}$ )
  - carbon dioxide ( $\text{CO}_2$ )
  - many other carbon-based compounds in living things

## 2.1 Atoms, Ions, and Molecules

### ► Ions form when atoms gain or lose electrons.

- An ion is an atom that has gained or lost one or more electrons.
  - positive ions
  - negative ions
- Ionic bonds form between oppositely charged ions.



## 2.1 Atoms, Ions, and Molecules

### ▶ Atoms share pairs of electrons in covalent bonds.

- A covalent bond forms when atoms share a pair of electrons.
  - multiple covalent bonds
  - diatomic molecules

