

ESSENTIAL
QUESTIONS:

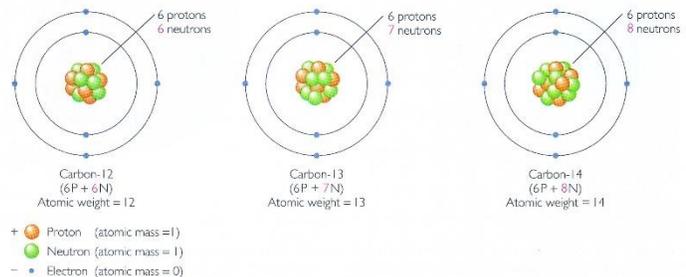
What are atoms?
How are the particles that make up atoms diagrammed?
What are the similarities between covalent and ionic bonds?

- Everything, living and nonliving, is made up of _____.
- An **element** is a _____ substance composed of only _____ type of atom.
 - o There are over _____ known elements, _____ of which occur naturally.
- An **atom** is the _____ particle of an element that retains the elements characteristics.
 - o Made of subatomic particles called neutrons ($n^0 =$ _____ charge), protons ($p^+ =$ _____ charge), and electrons ($e^- =$ _____ charge)
 - o *Draw a carbon atom with 6 protons, 6 neutrons, and 6 electrons in the space below:*

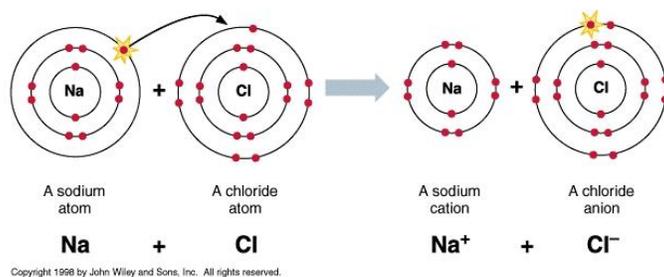
- o The different behavior of atoms is due to the different _____ of subatomic particles that each atom can have.
- Each element has a specific number of _____. If you change the number of protons, you change the _____.
 - o Each proton is usually matched by an _____ (except in ions).
 - o The number of _____ may vary.
 - o If an atom has an _____ number of protons and electrons, it has _____ charge and is considered _____.
 - o Charged particles are called **ions**.
 - _____ = positively charged
 - _____ = negatively charged
- **Isotopes** – atoms of the _____ element that contain different numbers of _____.

- o Example: carbon-14
(compared to carbon-12)

- Changing the number of neutrons affects the stability of the atom, giving off _____.
- o These radioactive isotopes are used in _____ objects and treating _____ cells.



- A **compound** is a pure substance formed when two or more different _____ combine.
 - o Example: _____ (NaCl)
 - o Compounds are always formed from a specific combination of elements in a _____.
- Electrons are responsible for forming _____, the forces that hold substances together.
 - o Atoms become more stable by _____ electrons or _____ electrons from other atoms.
 - o The chemical bond that forms when electrons are _____ is called a **covalent bond**.
 - We call this type of compound a **molecule**.
 - There is no overall _____ ($p^+ = e^-$)
 - Examples: methane (CH₄), water (H₂O), carbon dioxide (CO₂), & oxygen gas (O₂)
 - o An atom that has _____ or _____ one or more electrons is an **ion**.
 - Ions carry an electric charge because of the _____ number of p^+ and e^-
 - An **ionic bond** is an electrical attraction between two oppositely charged _____
 - Some atoms tend to donate or accept electrons more easily than other atoms.
 - o _____ donate electrons.
 - o _____ accept electrons.



- o Compared to covalent, most ionic compounds:
 - _____ better in water
 - Are _____ at room temperature
 - Have higher _____ points
- There is a third category called _____ bonding.
 - o These are the _____ types of bonds in which a hydrogen atom (slightly positive) will bond to an electronegative (slightly negative) atom or molecule.