Chemical Compounds

- A **chemical compound** is a **substance formed by the chemical combination of two or more elements in definite proportions.**

Chemical Compounds

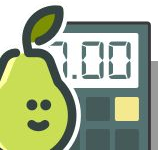
- Scientists use chemical formulas to **show the ratio of elements that make up a compound.**

Example: Water – H_2O (2 hydrogens : 1 oxygen)

Chemical Compounds

How many oxygens are in sucrose?

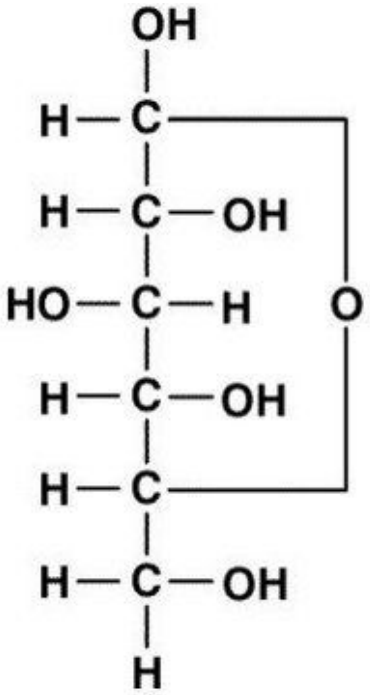
$$C_{12}H_{22}O_{11}$$



Students, enter a number!

Chemical Compounds

What is the chemical formula for glucose?
(the elements are listed in alphabetical order)



Chemical Compounds

- The **physical and chemical properties** of a compound are usually **very different** from those of the elements from which it is formed.

  For example, sodium is a silver-colored metal that is soft enough to cut with a knife. It reacts explosively with cold water. Chlorine is a very reactive, poisonous, greenish gas that was used in battles during World War I.

Chemical Compounds

- However, the compound sodium chloride--table salt--is a white solid that dissolves easily in water, is not poisonous, and is essential for the survival of most living things.

What types of bonds form between certain elements?

Before we move on, let's review…

What are the two types of bonds we reviewed yesterday?

Students, write your response!

Ionic vs. Covalent Bonds

- Ionic bonds involve the **transfer of electrons**
  - They usually form between **a metal and a nonmetal**

- Covalent bonds involve the **sharing of electrons**
  - They usually form between **nonmetals**

Ionic vs. Covalent Bonds

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But how do you tell if an element is a metal or nonmetal?

Metal or Nonmetal?

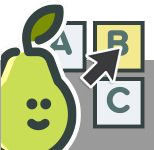
- Look at the Periodic Table to **determine if an element is a metal or nonmetal**
  - Appendix E (A-24 in the back of your textbook)
  - Using our Periodic Table, **metals** are **red**, **orange**, **light orange**, **and** **yellow**
  - Nonmetals are **blue**

  - Remember that all Periodic Tables are colored differently! These colors are only true for the Periodic Table used by our textbook.

Metal or nonmetal?

Sodium

Na



Metal or nonmetal?

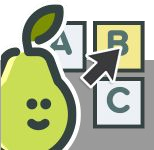
Nitrogen

N

Metal or nonmetal?

Oxygen

O

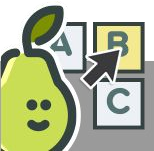


Students choose an option

Which type of bond would form between:

Sodium and chlorine in table salt?

NaCl



Which type of bond would form between:

Carbon and hydrogen in methane?

CH_4