

Life is a blend of the life sciences

- We cannot neatly package nature into the various life sciences (chemistry, physics, biology)
- Biologists specialize in the study of life, however organisms exist in systems where the concepts of chemistry and physics also apply
- Biology is a multidisciplinary science; it draws on the insights of other sciences.

Matter consists of chemical elements in pure form and in combinations called compounds

- Organisms are composed of **matter**.
 - Matter is anything that takes up space and has mass.
- An **element** is a substance that cannot be broken down to other substances by chemical reactions.
 - There are 92 naturally-occurring elements.
 - Each element has a unique symbol, usually from the first one or two letters of the name, often from Latin or German.
- A **compound** is a substance consisting of two or more elements in a fixed ratio.
 - Table salt (sodium chloride or NaCl) is a compound with equal numbers of chlorine and sodium atoms.
 - While pure sodium is a metal and chlorine is a gas, their combination forms an edible compound, an emergent property.

Life requires about 25 chemical elements

- About 25 of the 92 natural elements are known to be essential for life.
 - Four elements - carbon (C), oxygen (O), hydrogen (H), and nitrogen (N) - make up 96% of living matter.
 - Most of the remaining 4% of an organism's weight consists of phosphorus (P), sulfur (S), calcium (Ca), and potassium (K).
 - **Trace elements** are required by an organism but only in minute quantities.