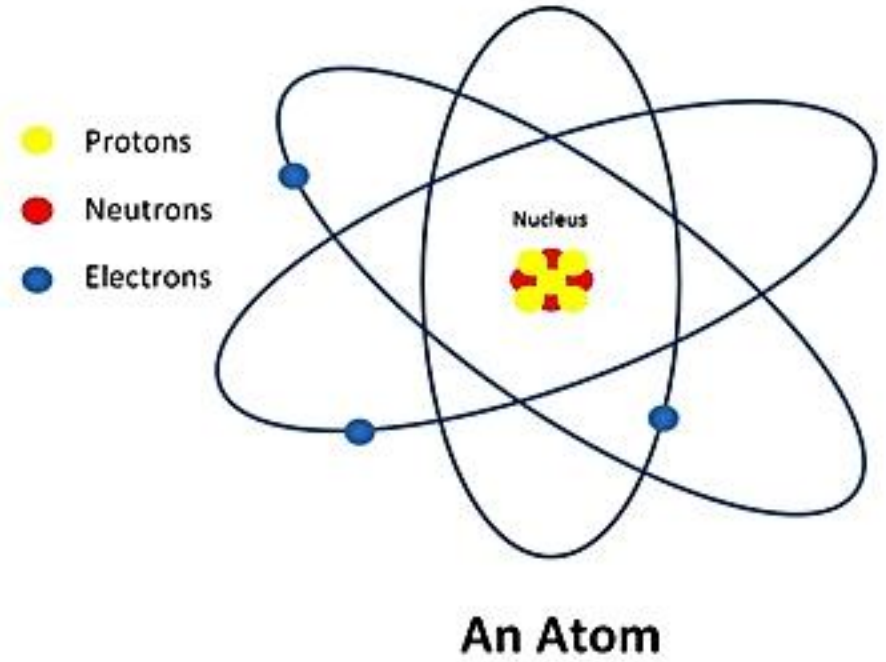
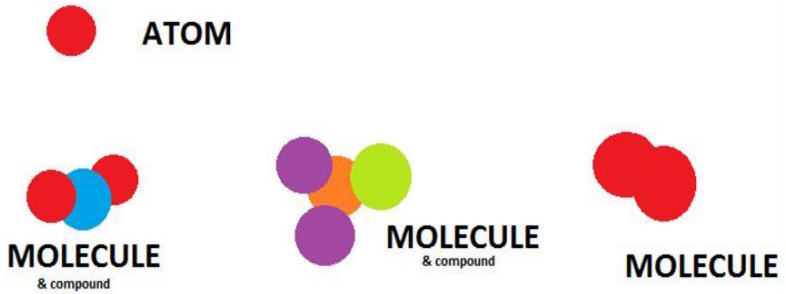
What is an atom?

- Basic building block for all matter in the universe
- Extremely small
- Made up of a few even smaller particles called electrons, protons, and neutrons



What is a molecule?

- The smallest unit of a substance that has all the properties of that substance.
- Made out of atoms that are bonded together.
- Elements are made out of entirely one type of atom
- Each element is a little bit different from the rest.

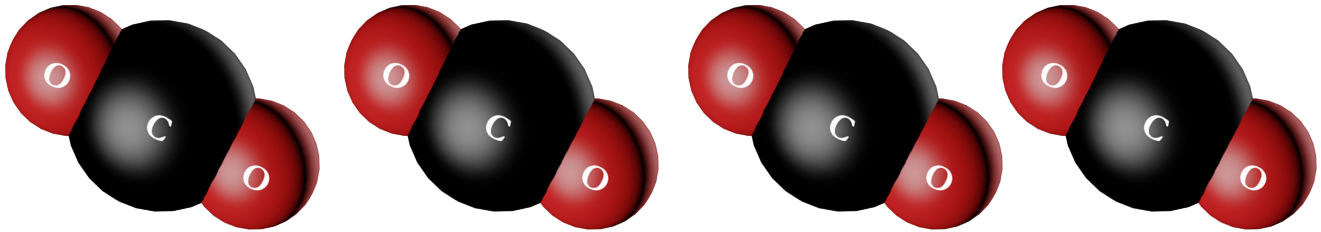


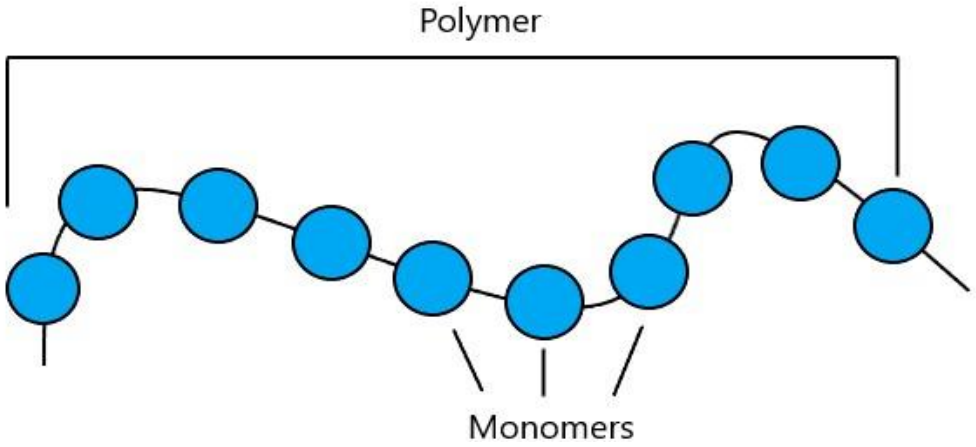
- For instance, a water molecule is the smallest unit that is still water. If you want to create a language, you'll need an alphabet! If you want to build molecules, you will need atoms from different elements. Elements are the alphabet in the language of molecules.
- In English, you know that “B” is different from “C.” In chemistry, “B” is also different from “C” because boron (B) and carbon (C) are different elements with atoms that have different structures. The periodic table of elements arranges all of the known chemical elements.

How do we represent molecules?

- A chemical formula is writing the elements in a molecule using their symbols.
- If there is more than one atom of the same element in the molecule, the formula shows it by a small number *after* the symbol.
- To show the number of molecules, a full sized number is located *in front* of the molecule.

4 CO_2

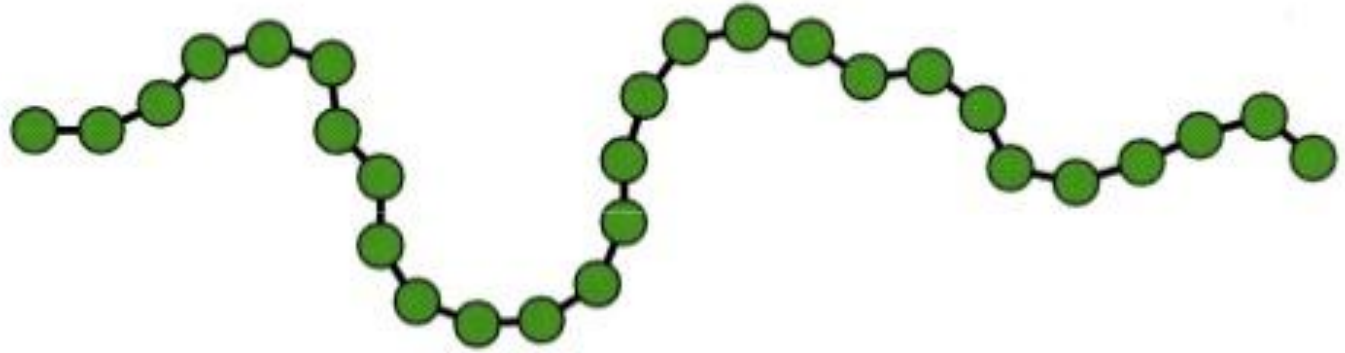




Polymers are large molecules formed of many repeated molecules called monomers. There can be thousands or even millions of monomers forming a polymer. Depending on what monomers are attached, their order, and their structure, the properties of the polymers vary widely. Some are stretchy, some very strong and tough, and others can be anywhere in between.

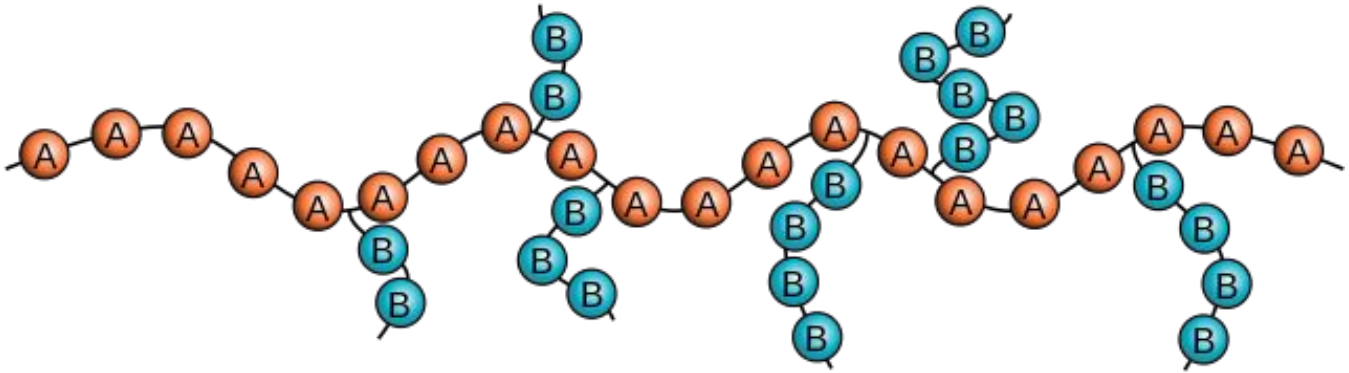
Human Polymers Activity

Linear Polymer



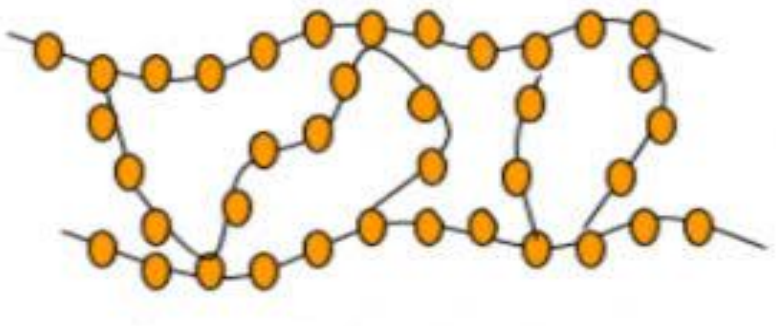
Some polymers are linear meaning that you can trace the polymer from beginning to end in one line, but these linear polymers do not have to be straight. They can be flexible, coiled up and curvy.

Branched Polymer



Groups of units branch off from the long polymer chain. These “branches” affect the properties of the polymer.

Cross-linked Polymer



A cross-link is a bond that links one polymer chain to another. Cross linked polymers are long chains, either branched or linear, with cross links between them.