

Atoms, Elements, and Molecules

OK, so -- what's an atom and what does it have to do with molecules?

Let's talk tiny, and I mean really itty-bitty. ATOMS are the basic building blocks of everything you can see around you, and even lots of things you can't see, like the air that you breathe. Atoms are so small that there are millions and billions and trillions in the tiniest speck you can see. Solids, liquids, gases - all matter - are made up of atoms (or other things, like molecules, that are made from atoms)!

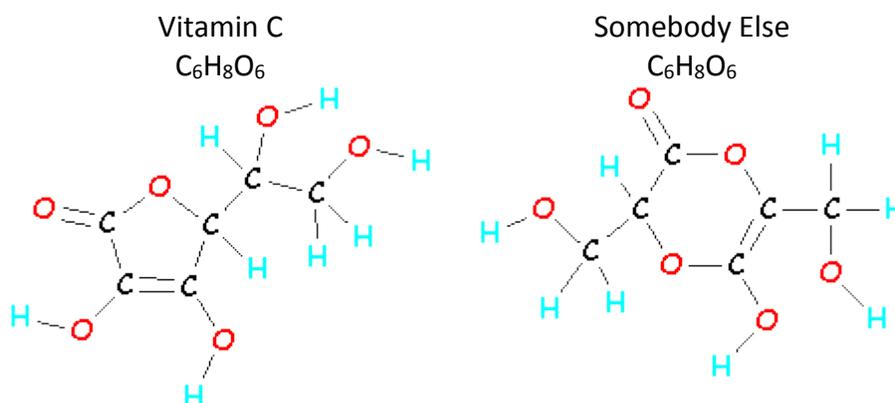
ELEMENTS are the *kinds* of atoms that we can have. Carbon is an element, hydrogen is an element, and so is oxygen. (We can call them by their names, or by their symbols - C for carbon, H for hydrogen, and O for oxygen.) All the elements are listed out in a periodic table. If it's in the table, it's an element!

Atoms can join together - they form bonds together - to make MOLECULES. For example, two atoms of hydrogen hook together to form a molecule of hydrogen, H₂ for short. Pretty simple, huh?

Now, if you stick an oxygen atom in between those two hydrogens, you have a molecule of water - H₂O!

Each type of atom typically forms the same number of bonds (they tend to be stubborn that way). For example, a hydrogen atom forms one bond, an oxygen atom forms two, and carbon forms four bonds. Look at that molecule of water again - each hydrogen has one bond, and the oxygen in the middle has two bonds.

Molecules can be much bigger. One molecule of vitamin C is made up of 20 atoms (6 carbons, 8 hydrogens, and 6 oxygens - that's C₆H₈O₆). If you take those 20 atoms of vitamin C and mix them around, bonding them together in a different order, you'll have a totally different molecule that not only looks different, it acts different. (If your legs were sticking out of your head, you'd act weird too!!)



So, molecules are atoms stuck together, but not just any old way. Changing which atom is bonded to which can change the properties of a molecule, that is, how it looks and acts - and that changes how a whole BUNCH of molecules hanging out together will look and act. For example, water is a liquid, hydrogen is a gas, and vitamin C is a solid.