Making molecular models

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It can be really useful to do chemistry on paper. It's important to remember that a 2D version isn't entirely accurate, though.

When we want to get a better idea of what a molecule really looks like in 3D, we can build a model. One great way of doing that is using Molymods.

Each different kind of atom is represented by a differently coloured ball.

Chemical bonds are represented by grey plastic pieces.

As we join atoms with bonds, we can make chemical compounds.

Each space on each atom must **ALWAYS** be filled.

What are the different parts?

Carbon

Hydrogen

Oxygen

Nitrogen

Phosphorus

Sulphur

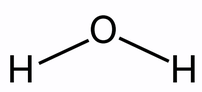
Single bond

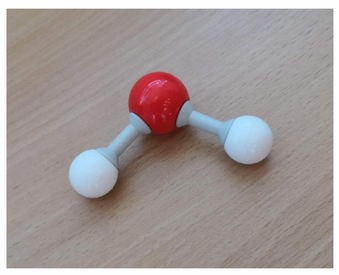
Double bond

How to build some simple molecules

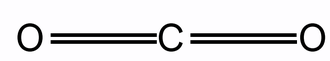
Water has the molecular formula H_20. This means it has 2 hydrogen atoms and 1 of oxygen.

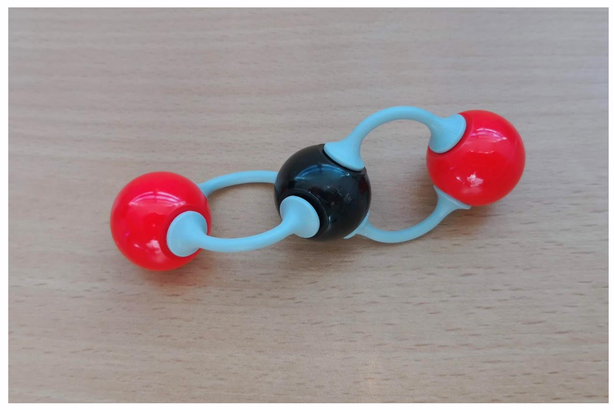
We use the shorter, thicker grey pieces to be **single bonds**





Carbon dioxide has the formula CO2. This means it has 2 carbon atoms and 1 of oxygen. We have to fill all of the spaces on each atom. To do this, carbon dioxide has **double bonds**.





What shapes are common in medicines?

Carbon atoms are a common backbone to many medicines. They can be in long chains, or often appear in rings.

Fluorine is a very powerful atom in medicine design. It can make for a useful medicine, but too much can make it unstable.

How do we make these shapes in the lab?

Medicinal chemists are scientists with expertise in changing molecule shapes. They carry out lots of different chemical reactions which can add atoms on, take them away, or change the shapes.
Biologists then test these new molecules, seeing if they will kill parasites. They work in a cycle of design, make and test.

Our vision: To help tackle the urgent unmet medical need and lack of drug discovery for Neglected Tropical Diseases