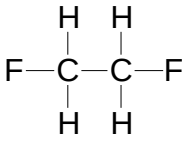
to have your model look like each structure above. You simply twist the carbon-carbon bond or flip the molecule around.

Now lets talk about a new molecule, 1,2-difluoroethane. I just added another fluorine to our fluoroethane molecule.

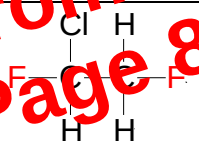
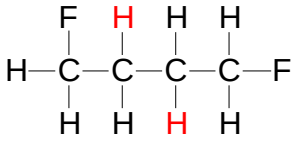
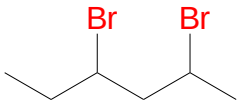


These two fluorine atoms are said to be chemically equivalent. This means that both fluorines will react, chemically, in exactly the same manner. To recognize you look at the carbon that the fluorine is bonded to. Both fluorines have the exact same description, the fluorines are bonded to a carbon that is singly bonded to another carbon and also bonded to two other hydrogens. Since both fluorines fit this description they are chemically equivalent.

If we look at the hydrogens on this molecule we can demonstrate that they too are all chemically equivalent. Each hydrogen fits this description, a hydrogen bonded to a carbon, the carbon is singly bonded to another hydrogen, a fluorine and another hydrogen.

Looking back to the fluoroethane we can see that not all of the hydrogens are chemically equivalent. On carbon #1, there is one fluorine and two hydrogens, on carbon #2 there are only three hydrogens.

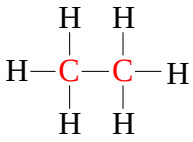
The following molecules have two colored atoms, these colored atoms are listed as either chemically equivalent or non-equivalent.

	non-equivalent
	equivalent
	non-equivalent

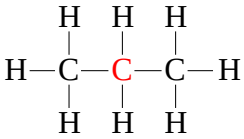
The easiest way to recognize chemical equivalence, is to look for symmetry. If the two atoms you are comparing have symmetry between themselves on the molecule, they are probably chemically equivalent.

Another Classification for Carbons:

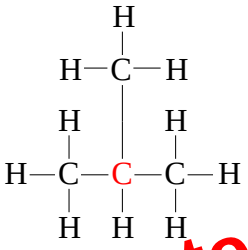
- primary carbon is bonded to one other carbon:
  - both of these carbons



- secondary carbon is bonded to two other carbons:
  - the center red carbon only



- tertiary carbon is bonded to three other carbons:
  - the center red carbon only



- quaternary carbon is bonded to four other carbons
  - the center red carbon only