



In methane, CH₄(g), carbon shares each of its valence shell electrons with a different hydrogen atom. The oxygen atom in water, H₂O(l), shares one electron with each hydrogen atom and also has two lone pairs.

Note the tetrahedral arrangement of the electron pairs around both central atoms in each molecule. Yet the two molecules do not have the same three-dimensional shape. Methane has no lone pairs and has four atoms bonded to its central carbon atom. This results in a tetrahedral shape. Water has two lone pairs and two atoms bonded to its central oxygen atom. This results in a bent shape.