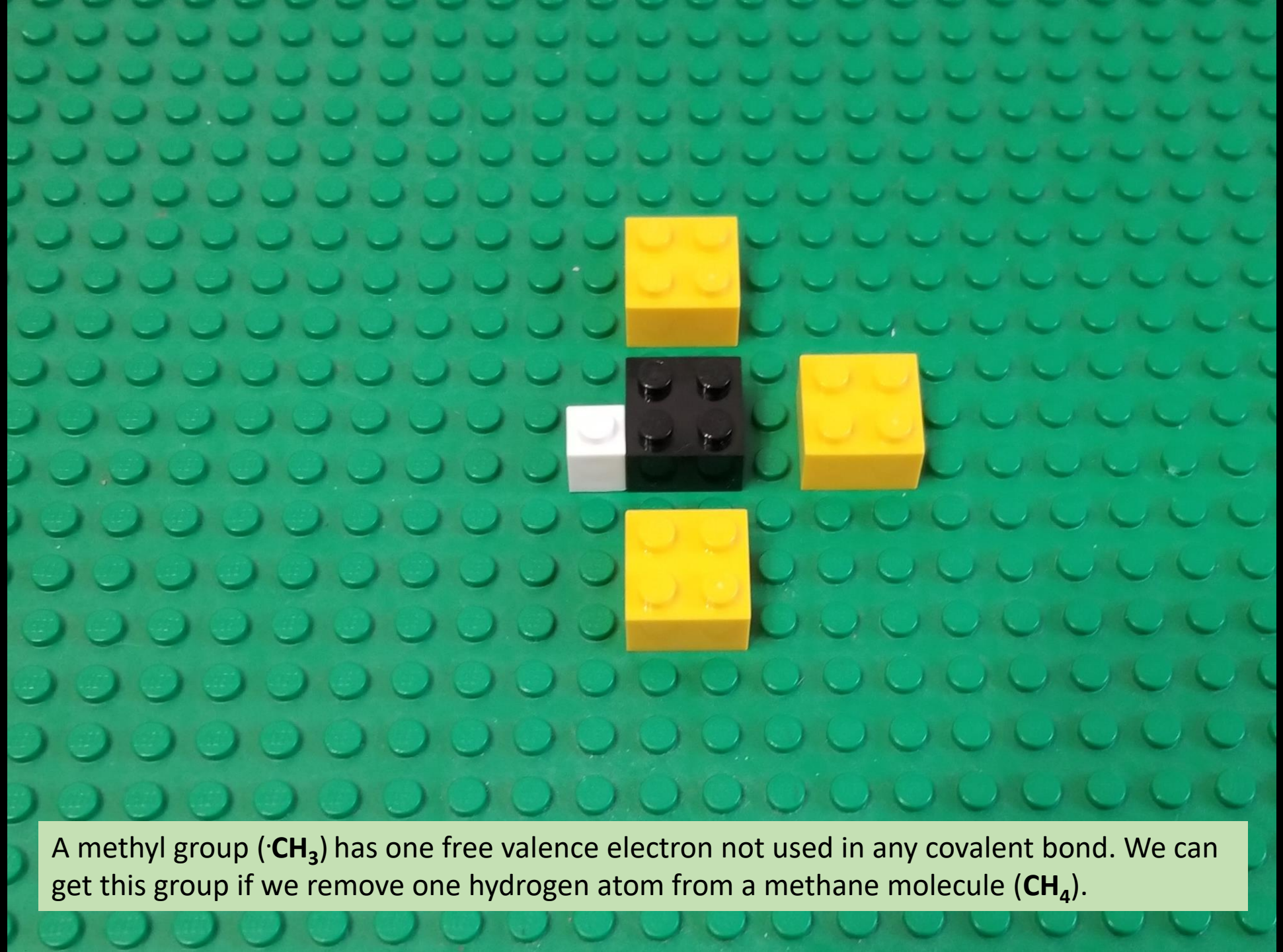
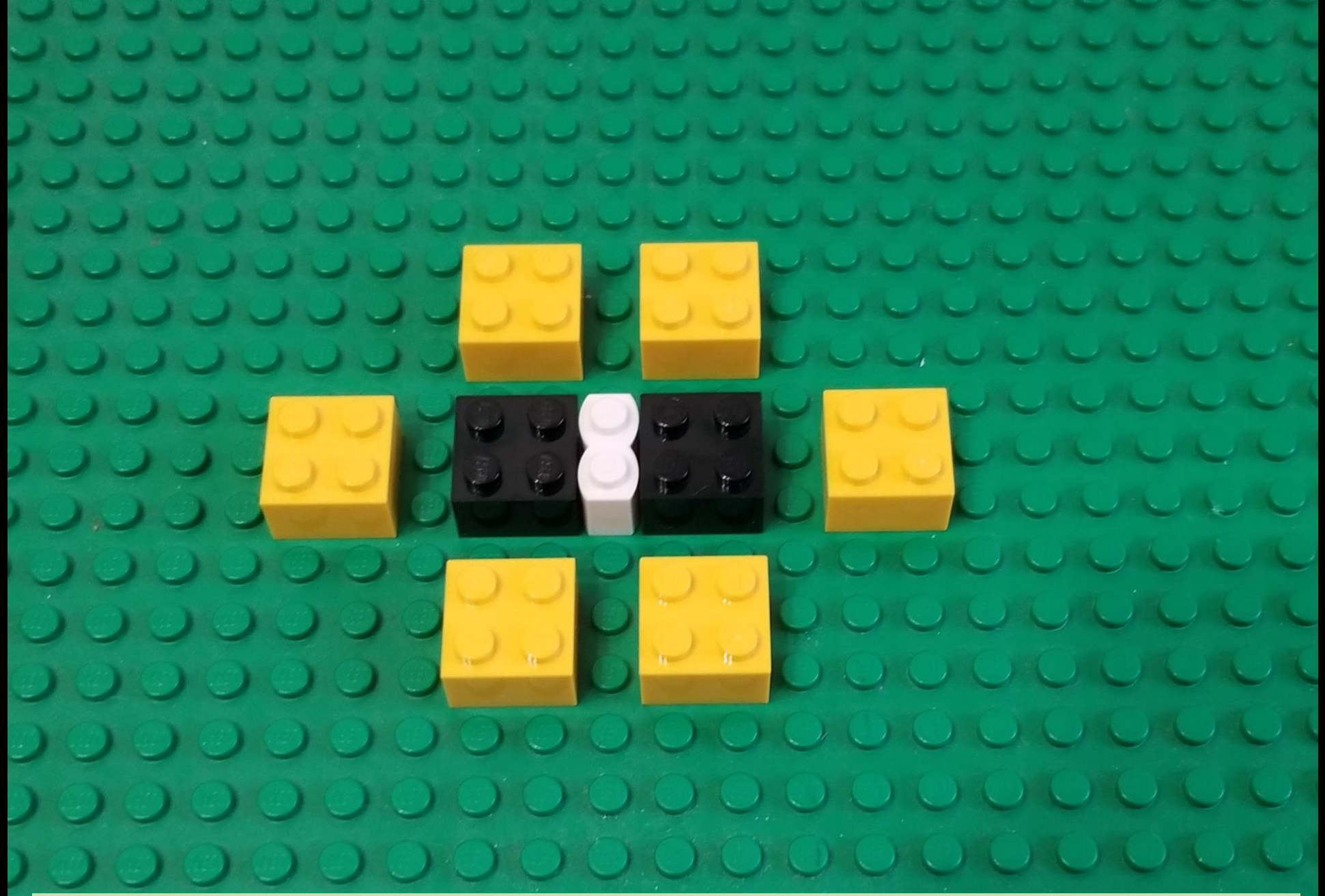
Organic Chemistry

Brick by Brick

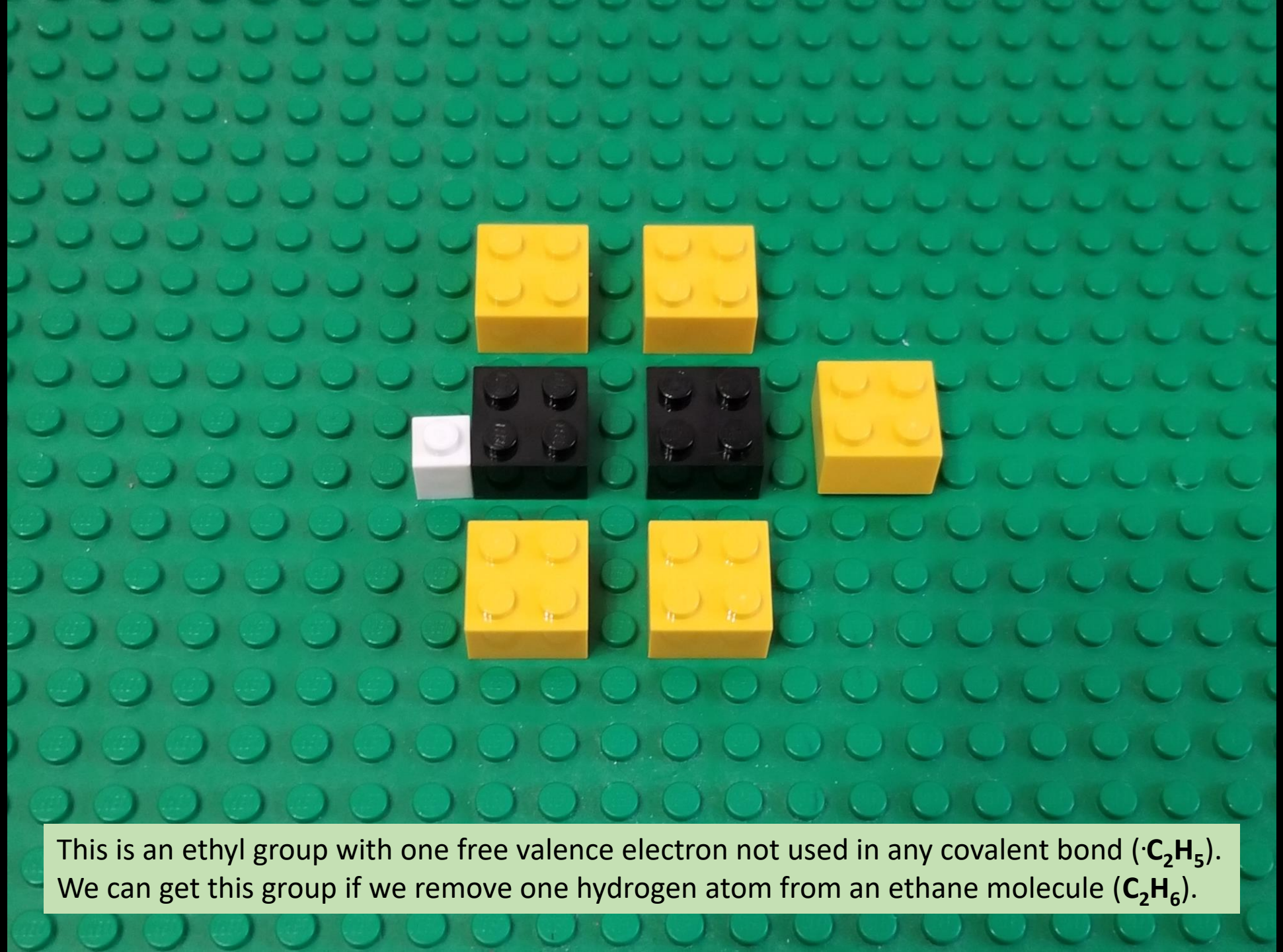
Part 3



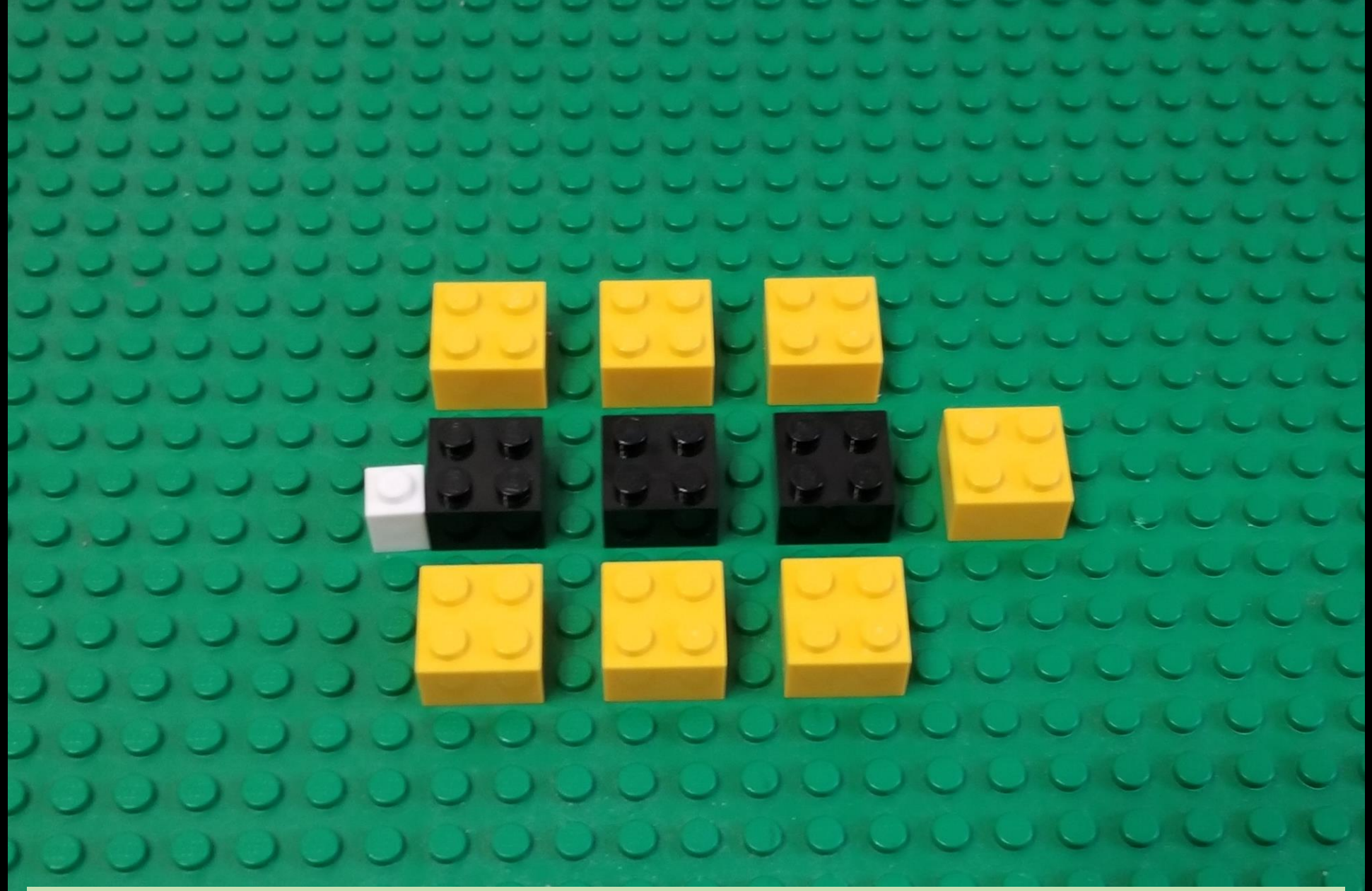
A methyl group (·**CH_3**) has one free valence electron not used in any covalent bond. We can get this group if we remove one hydrogen atom from a methane molecule (**CH_4**).



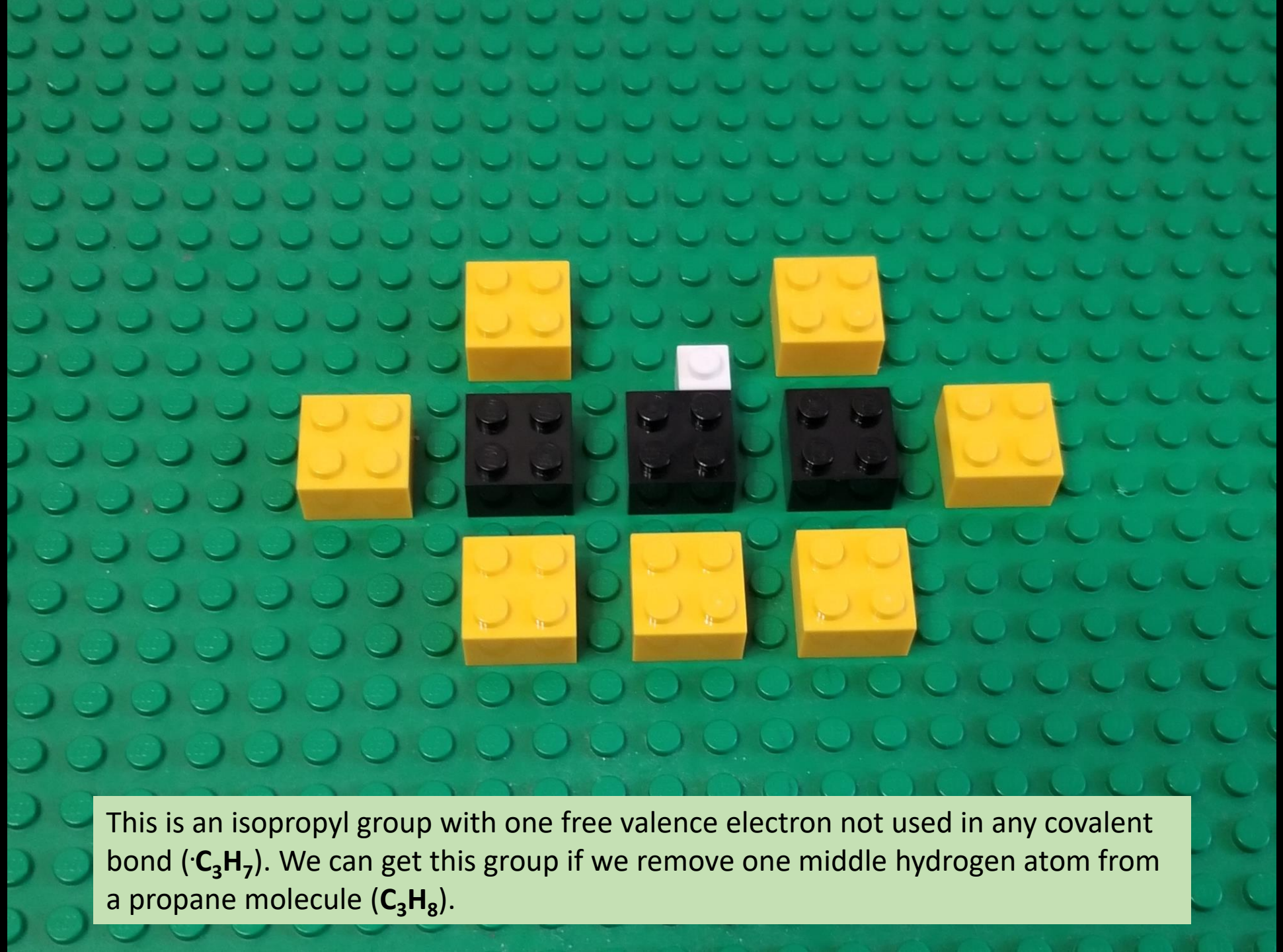
Valence electrons from two methyl groups (**·CH_3**) combine to form an ethane molecule (**C_2H_6**).



This is an ethyl group with one free valence electron not used in any covalent bond (·$\mathbf{C_2H_5}$).
We can get this group if we remove one hydrogen atom from an ethane molecule ($\mathbf{C_2H_6}$).

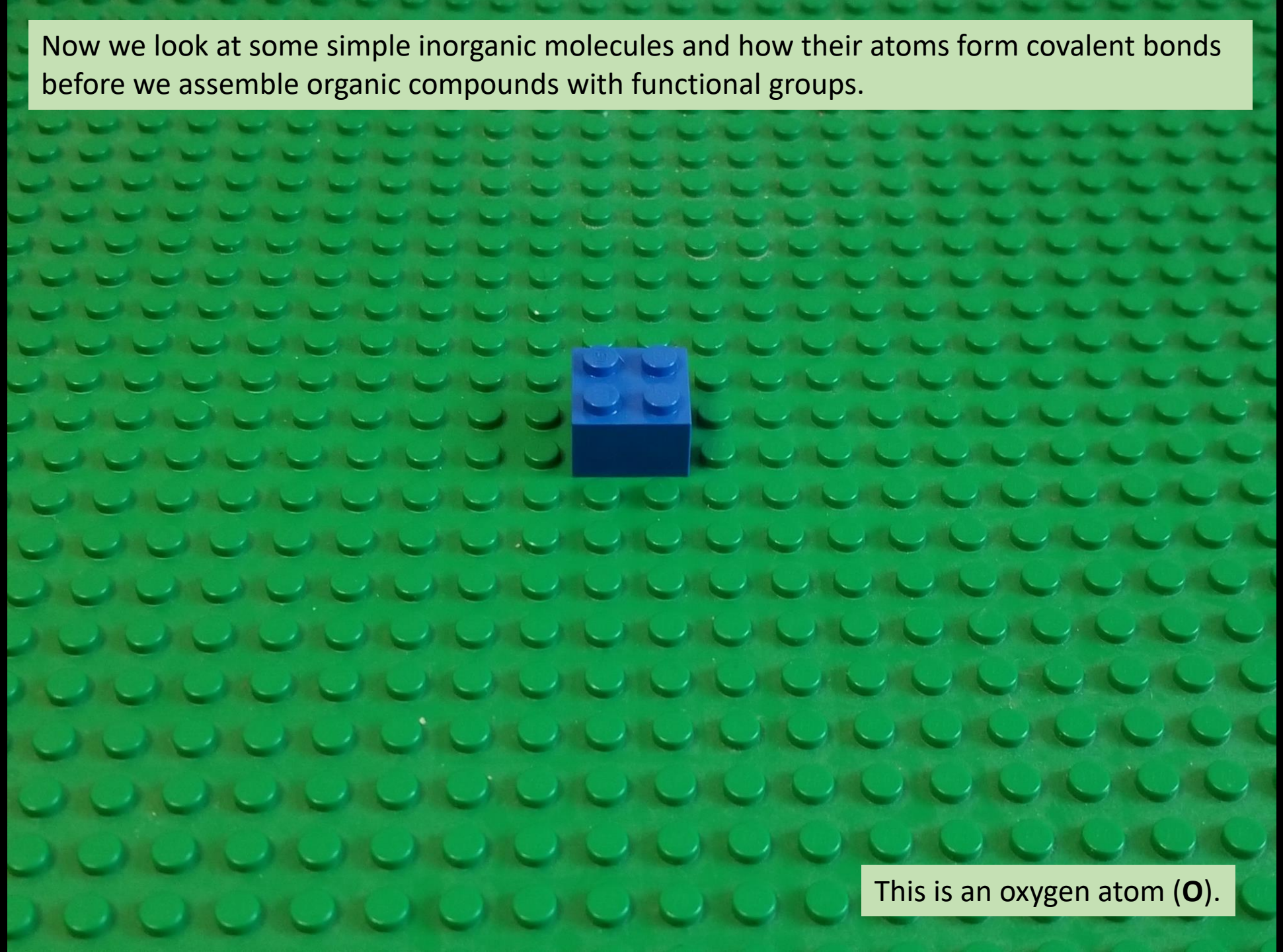


This is a propyl group with one free valence electron not used in any covalent bond (**·C_3H_7**).
We can get this group if we remove one rear hydrogen atom from a propane molecule (**C_3H_8**).

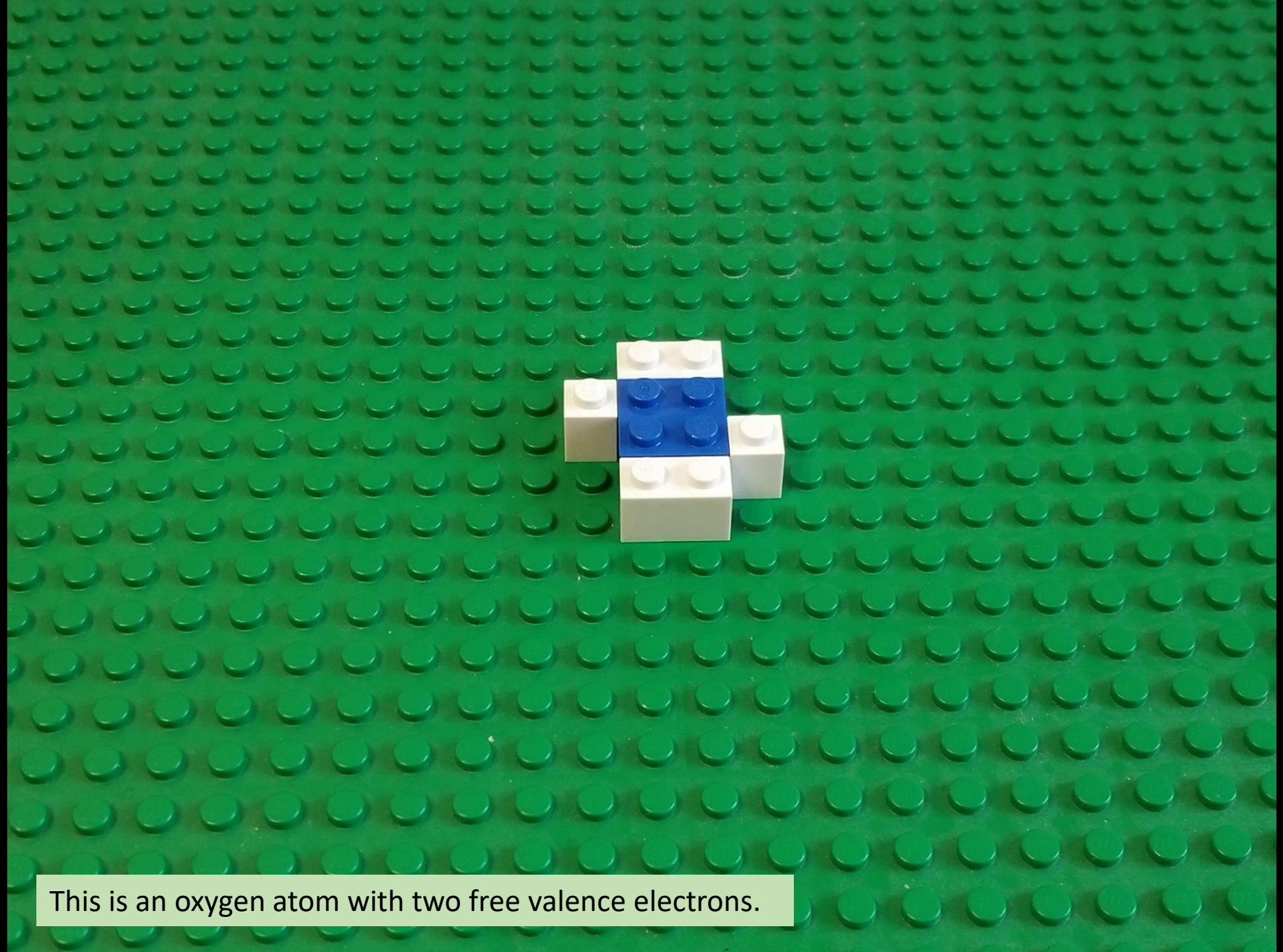


This is an isopropyl group with one free valence electron not used in any covalent bond (·$\mathbf{C_3H_7}$). We can get this group if we remove one middle hydrogen atom from a propane molecule ($\mathbf{C_3H_8}$).

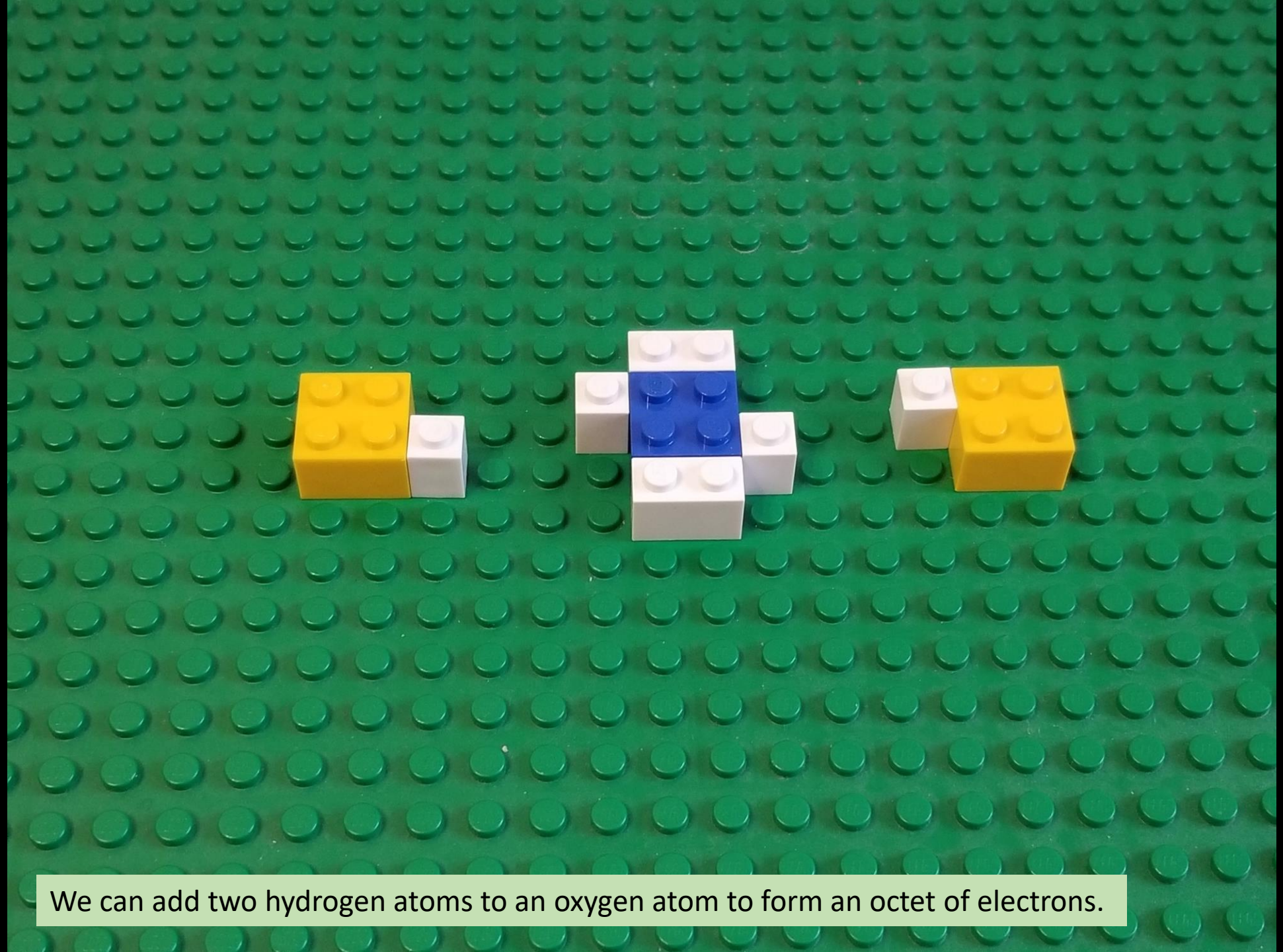
Now we look at some simple inorganic molecules and how their atoms form covalent bonds before we assemble organic compounds with functional groups.



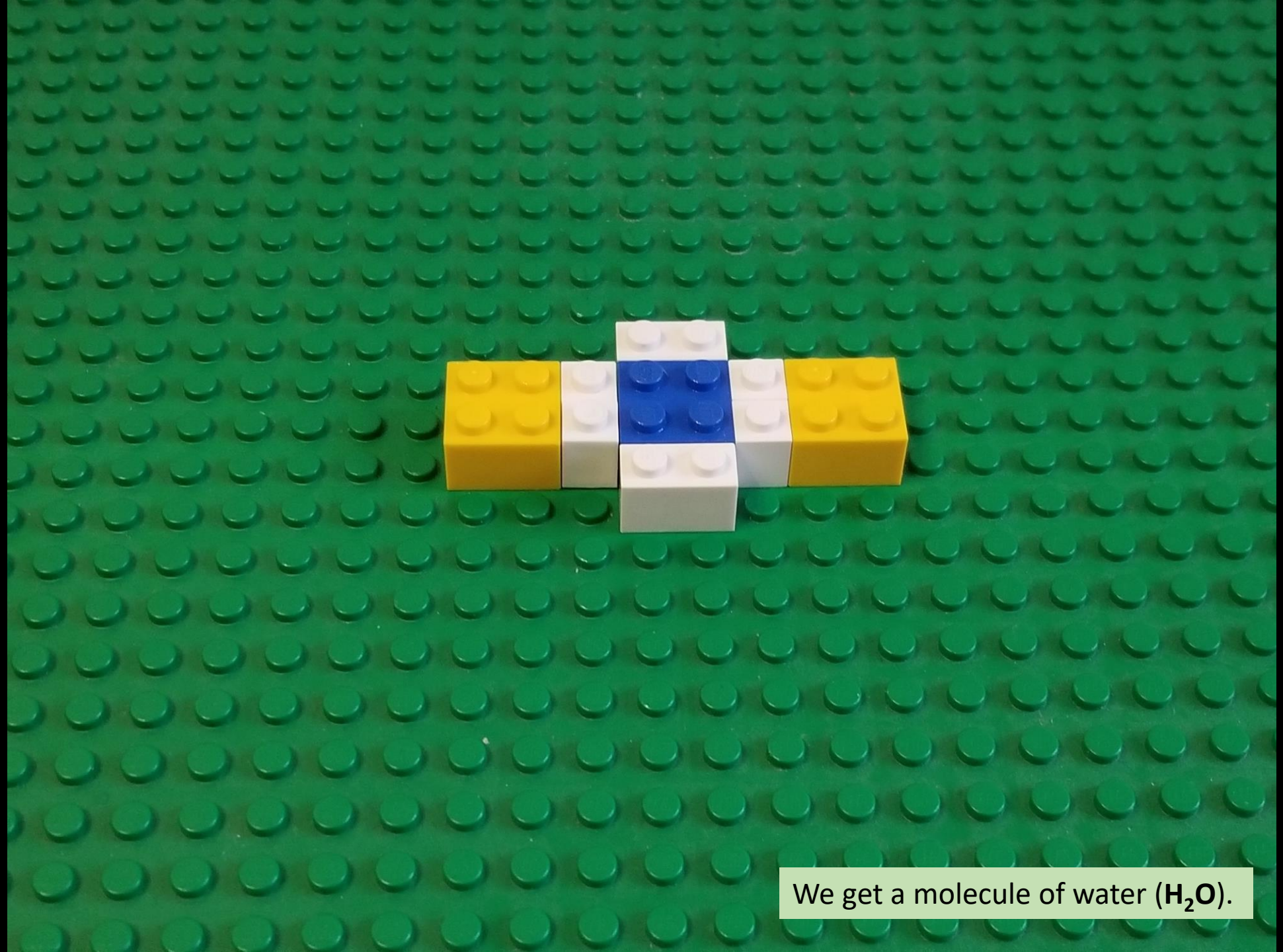
This is an oxygen atom (**O**).



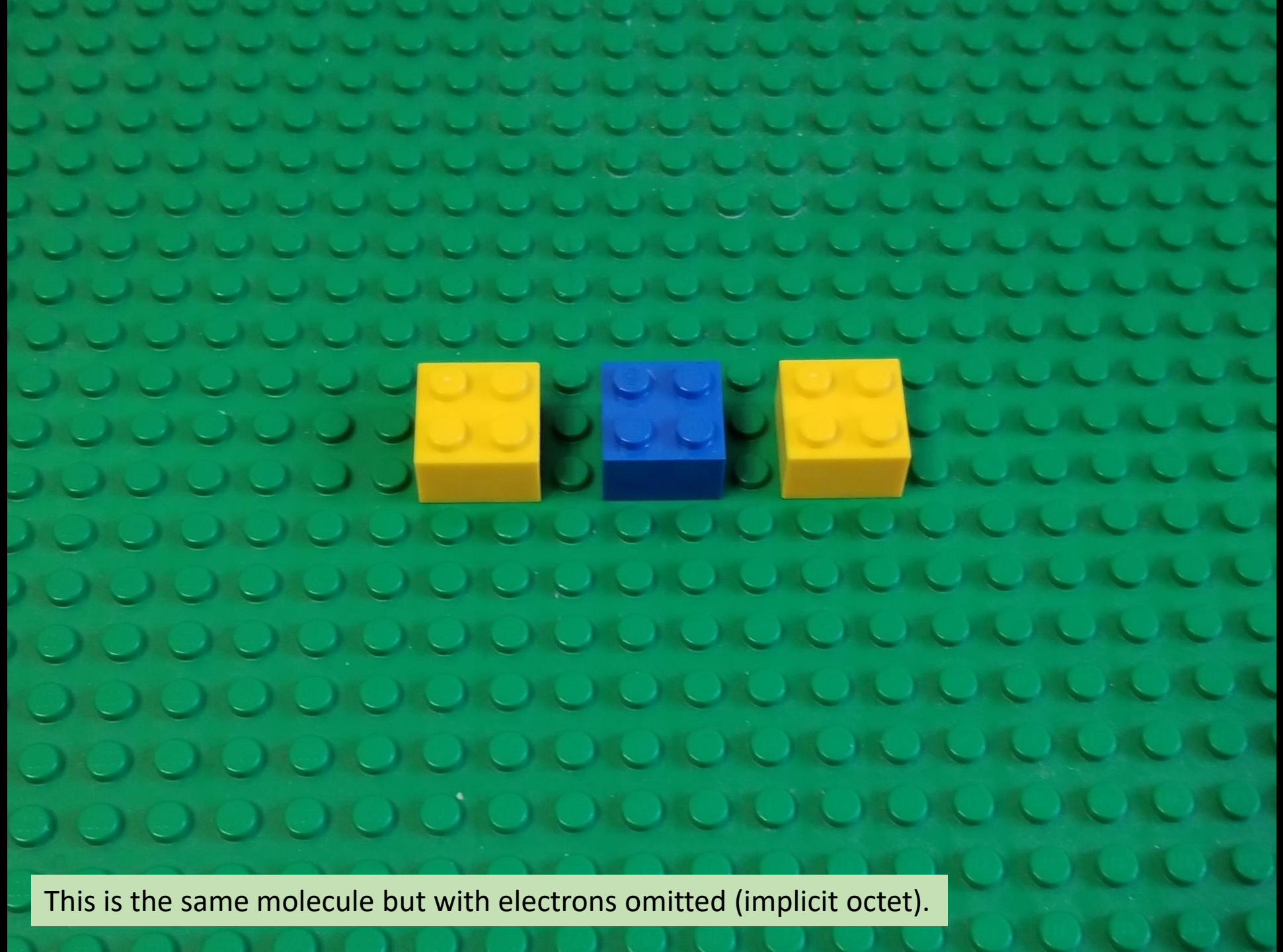
This is an oxygen atom with two free valence electrons.



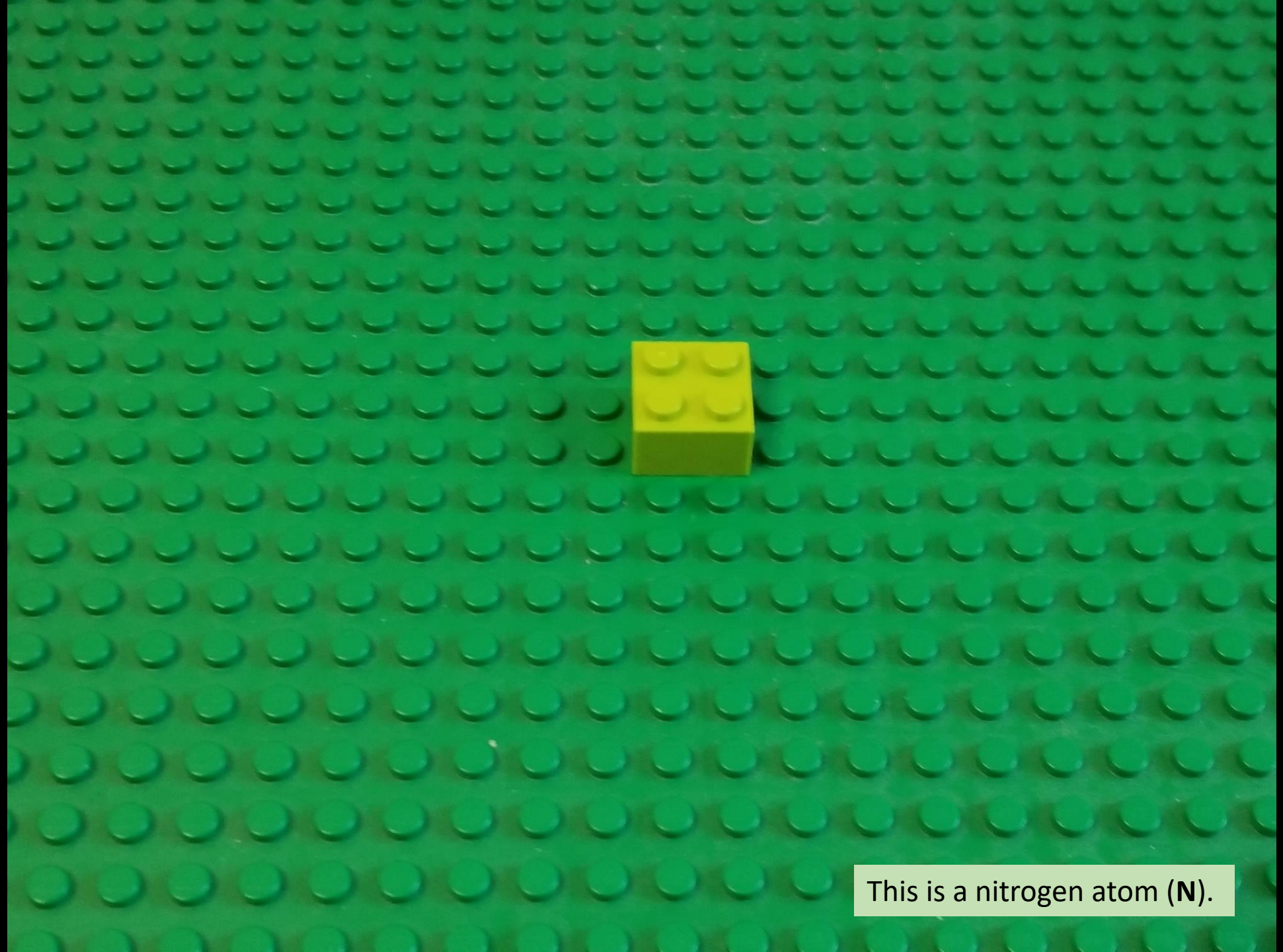
We can add two hydrogen atoms to an oxygen atom to form an octet of electrons.



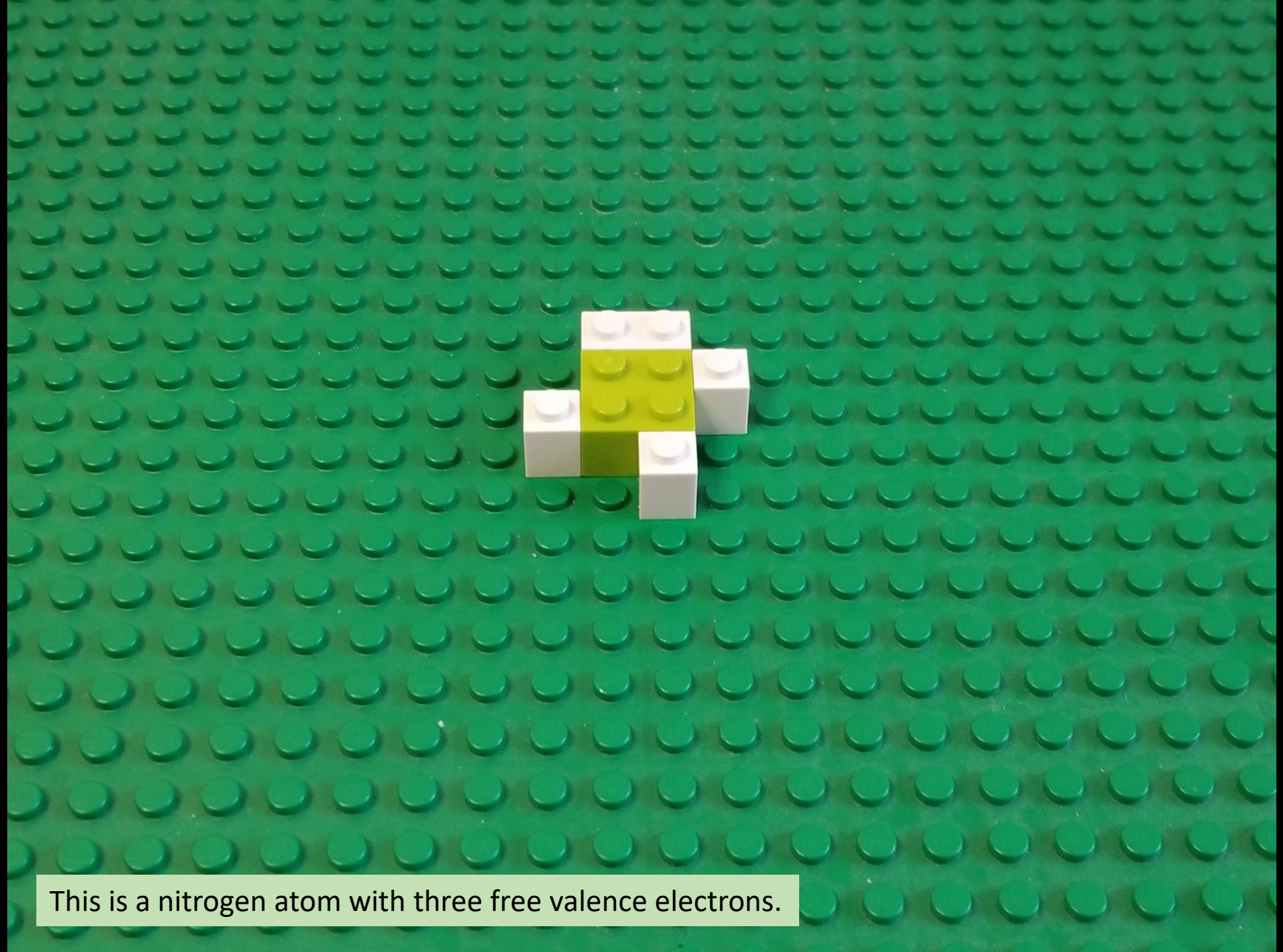
We get a molecule of water (**H_2O**).



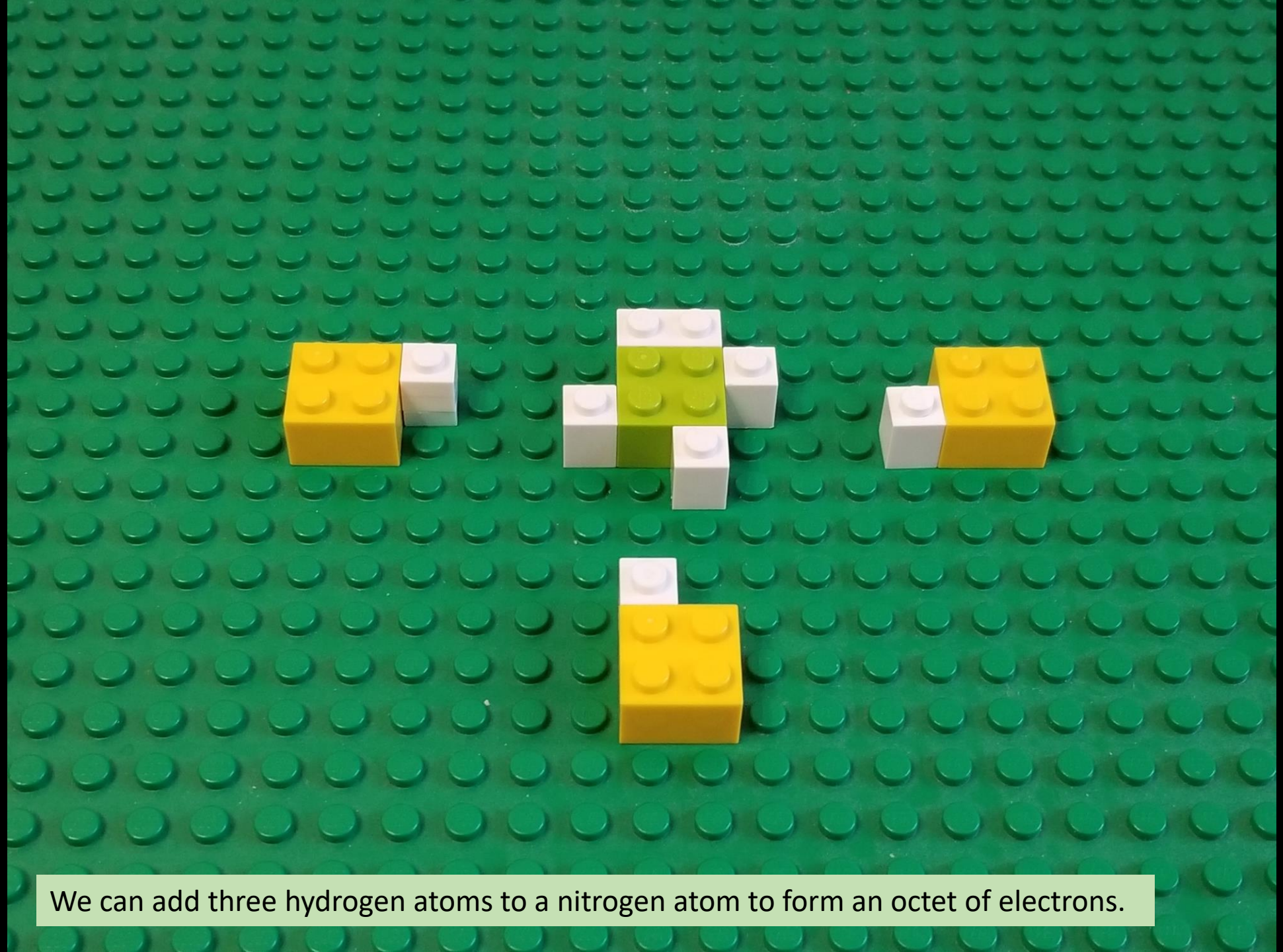
This is the same molecule but with electrons omitted (implicit octet).



This is a nitrogen atom (**N**).

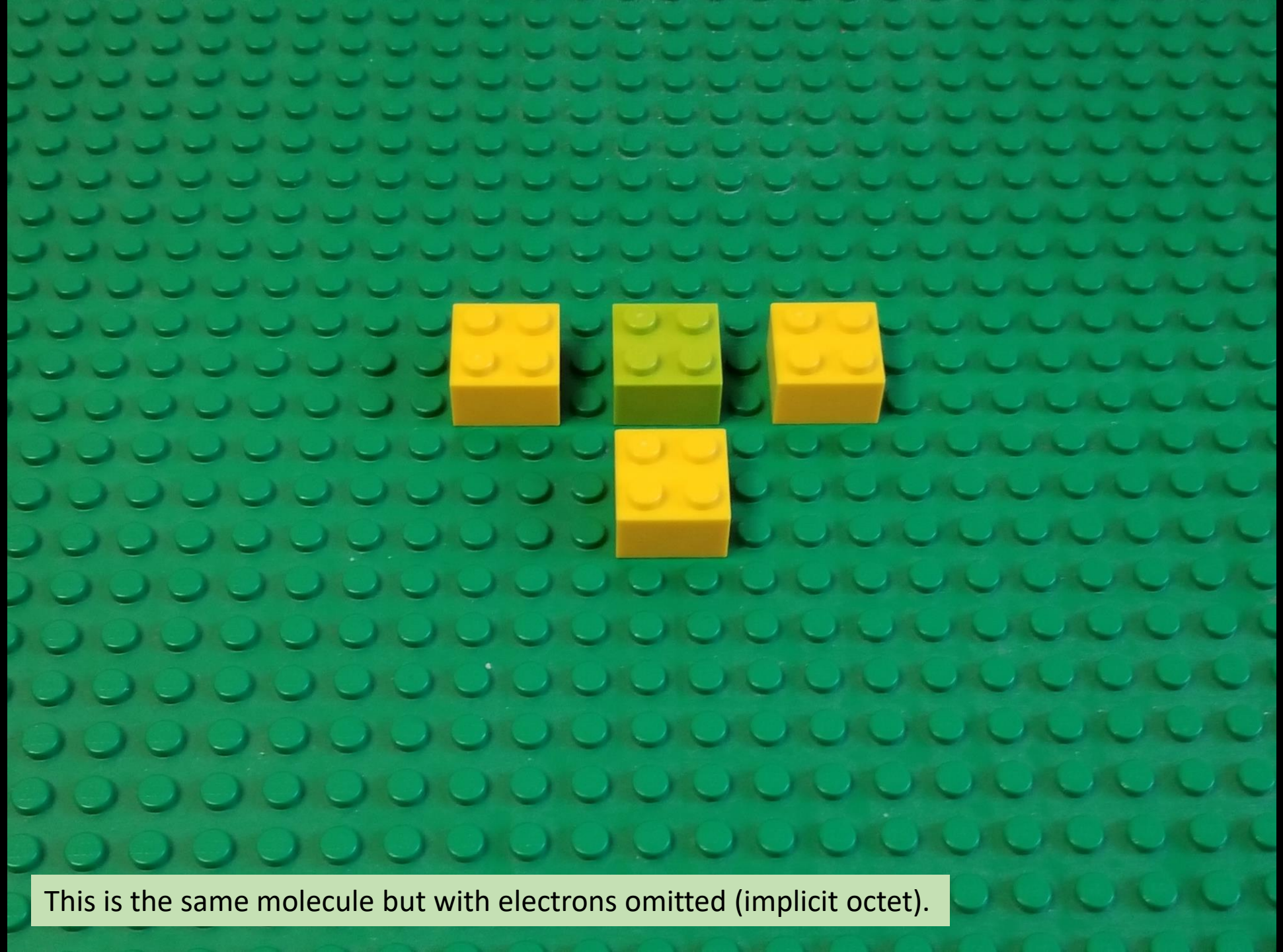


This is a nitrogen atom with three free valence electrons.



We can add three hydrogen atoms to a nitrogen atom to form an octet of electrons.

We get a molecule of ammonia (**NH_3**).



This is the same molecule but with electrons omitted (implicit octet).

Continued with Part 4