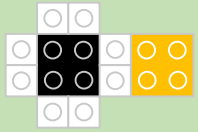
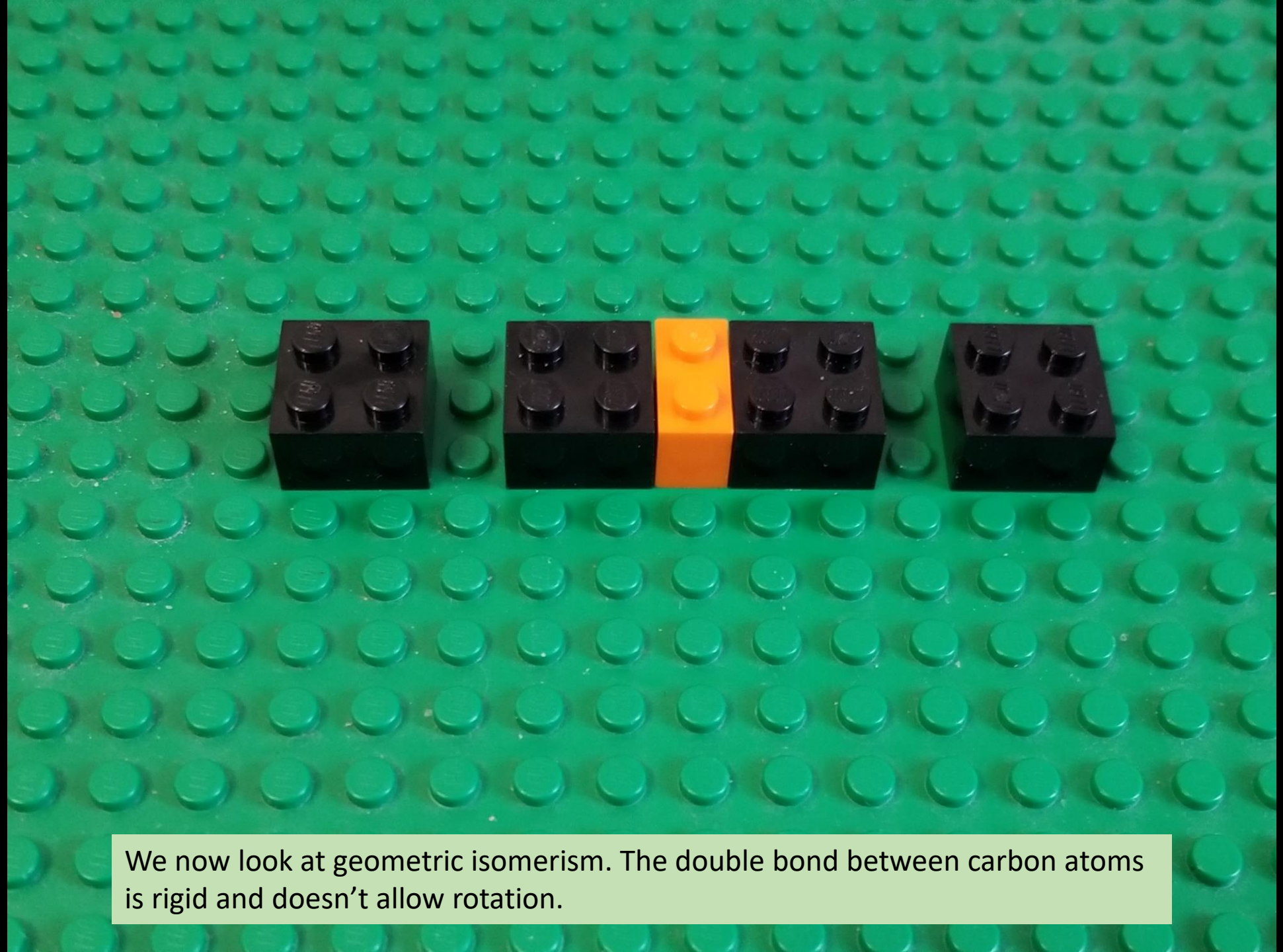


Organic Chemistry

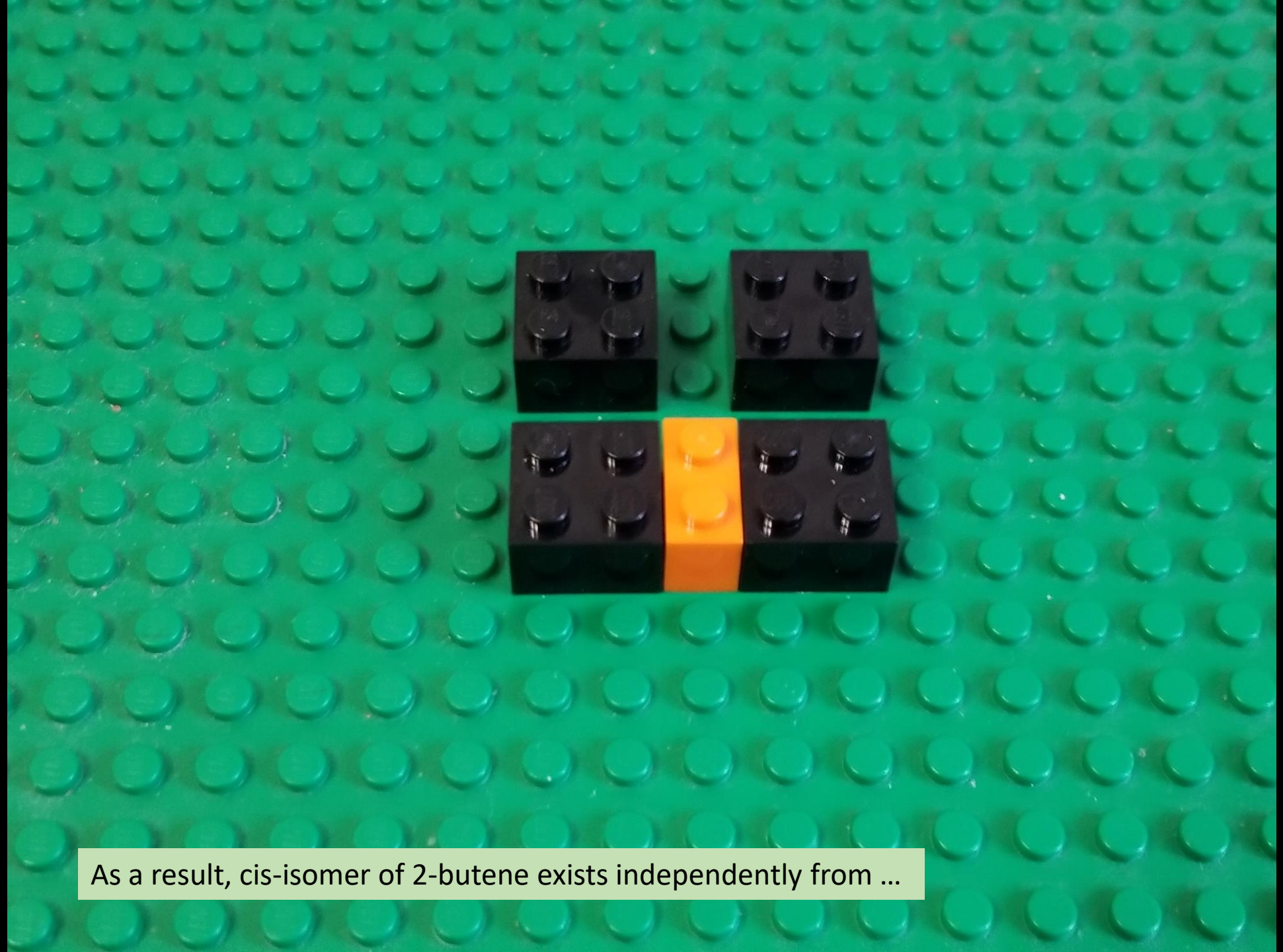


rick y rick

Part 11

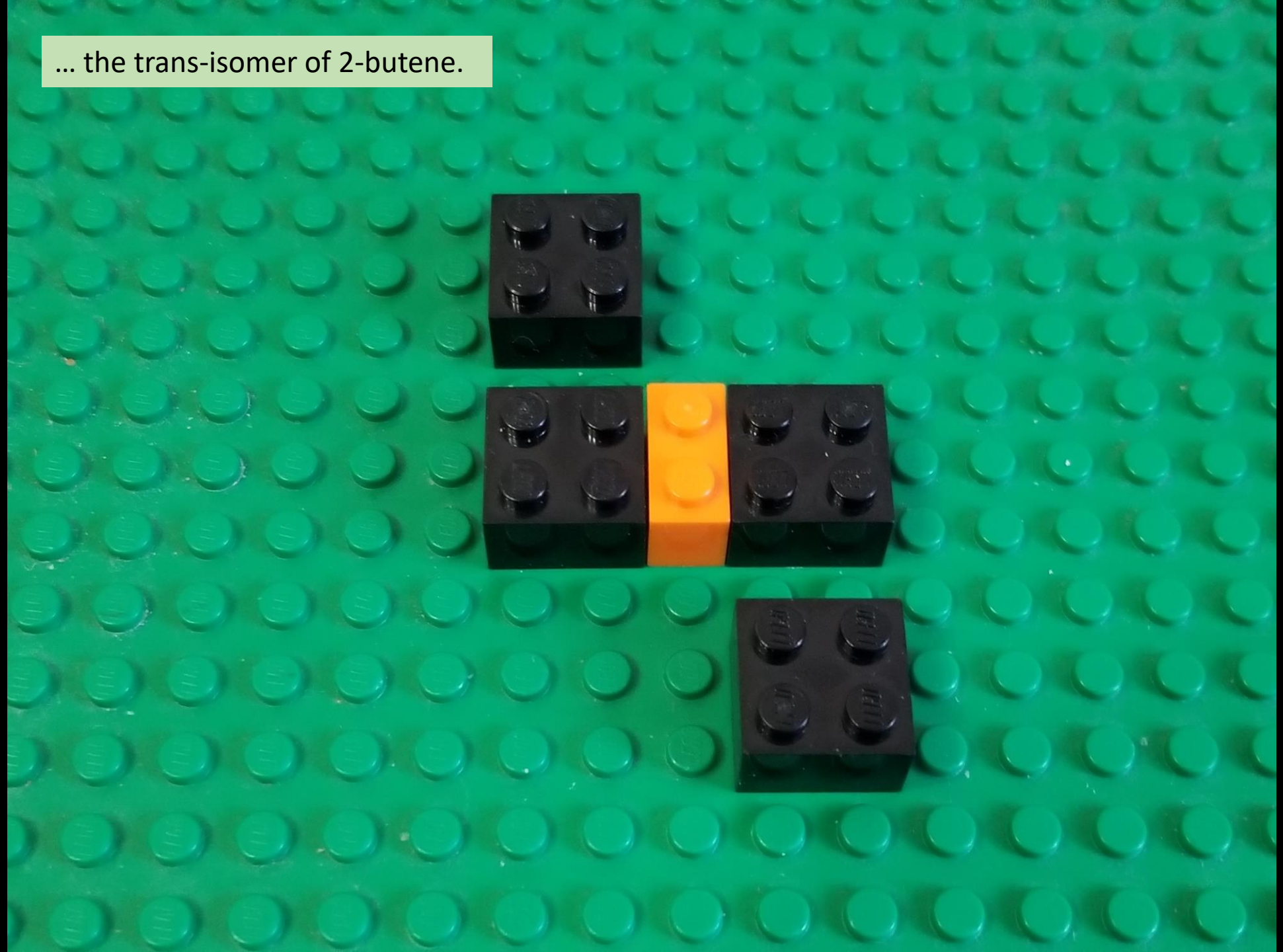


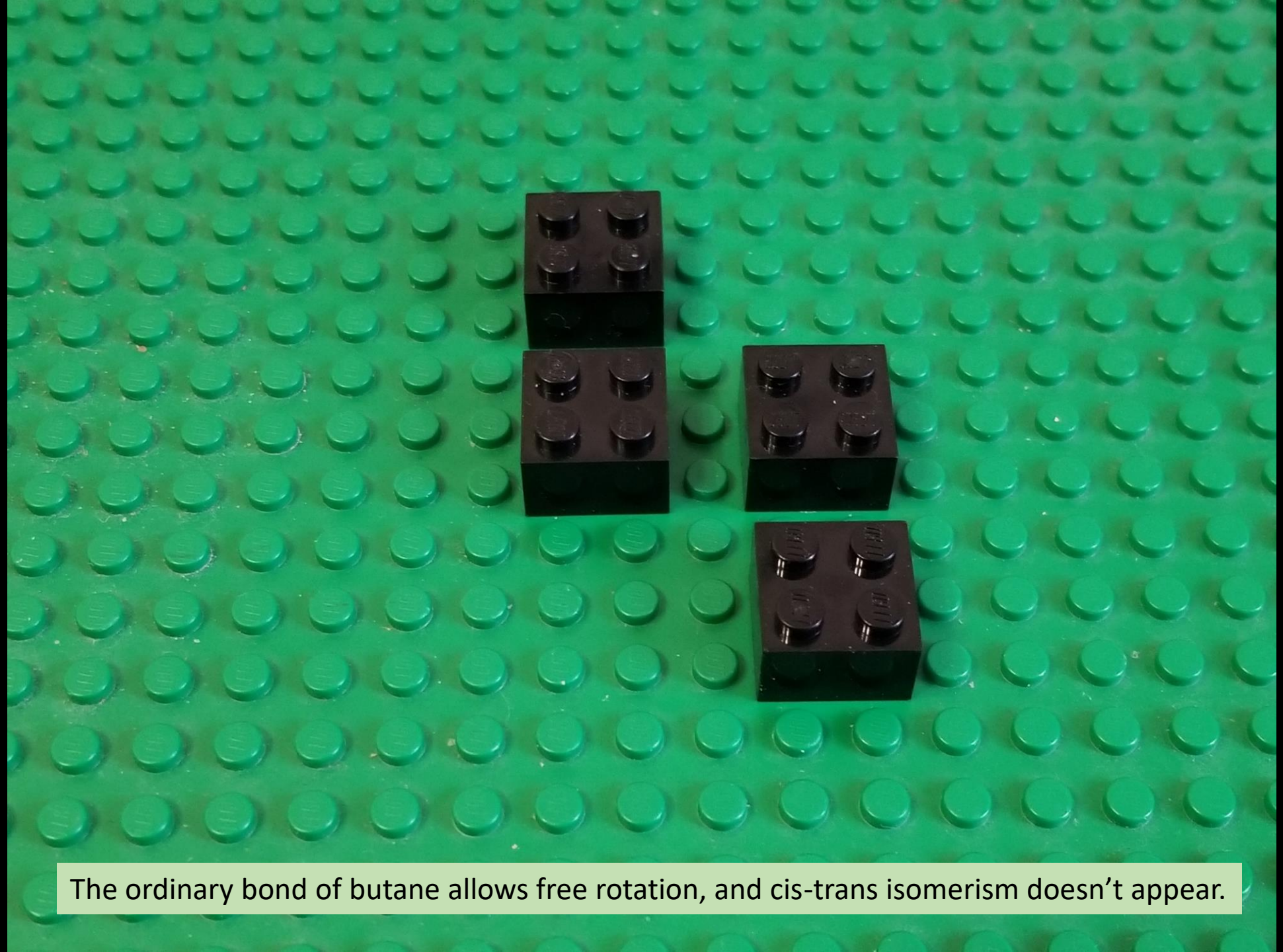
We now look at geometric isomerism. The double bond between carbon atoms is rigid and doesn’t allow rotation.



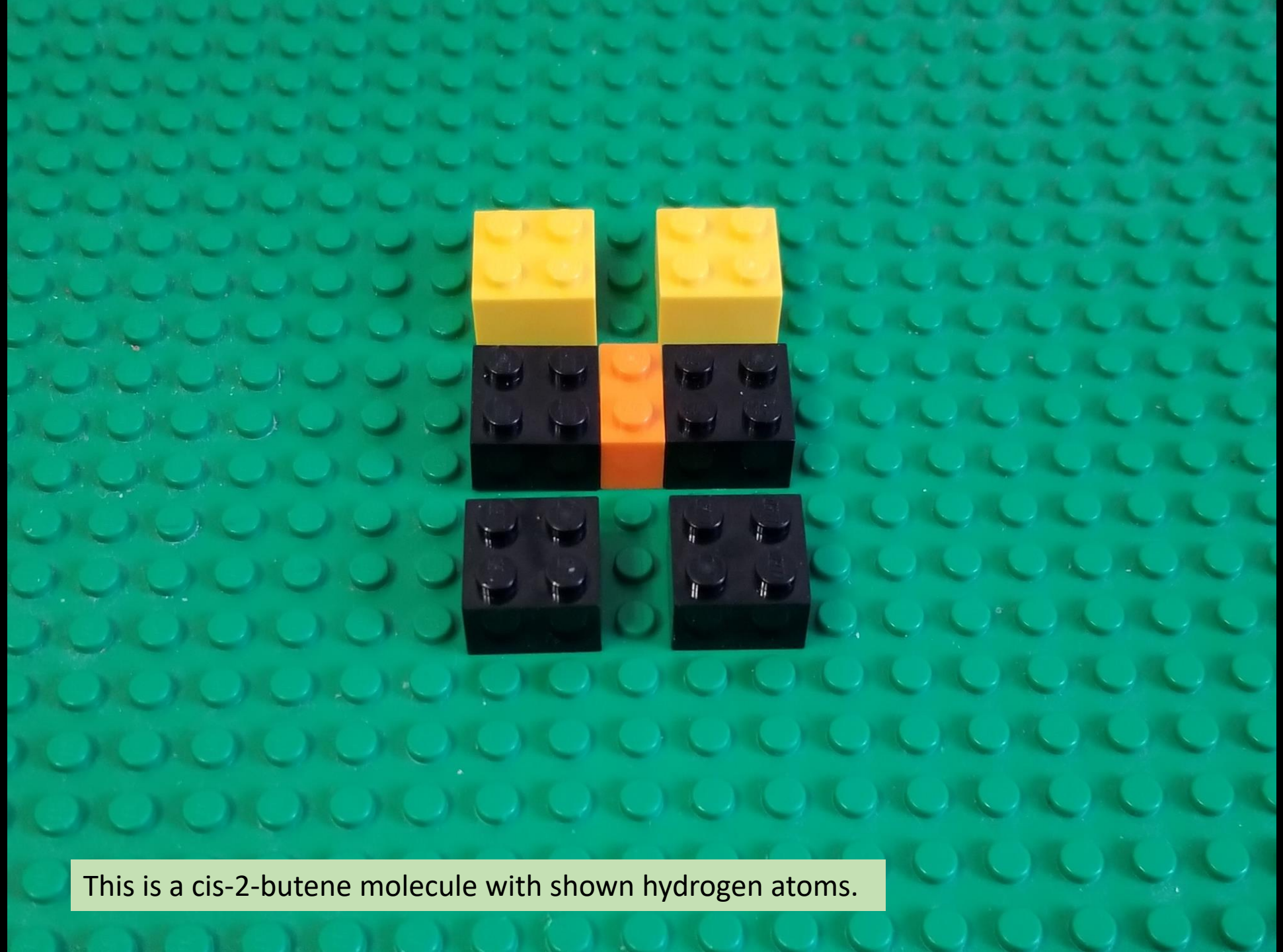
As a result, cis-isomer of 2-butene exists independently from …

… the trans-isomer of 2-butene.

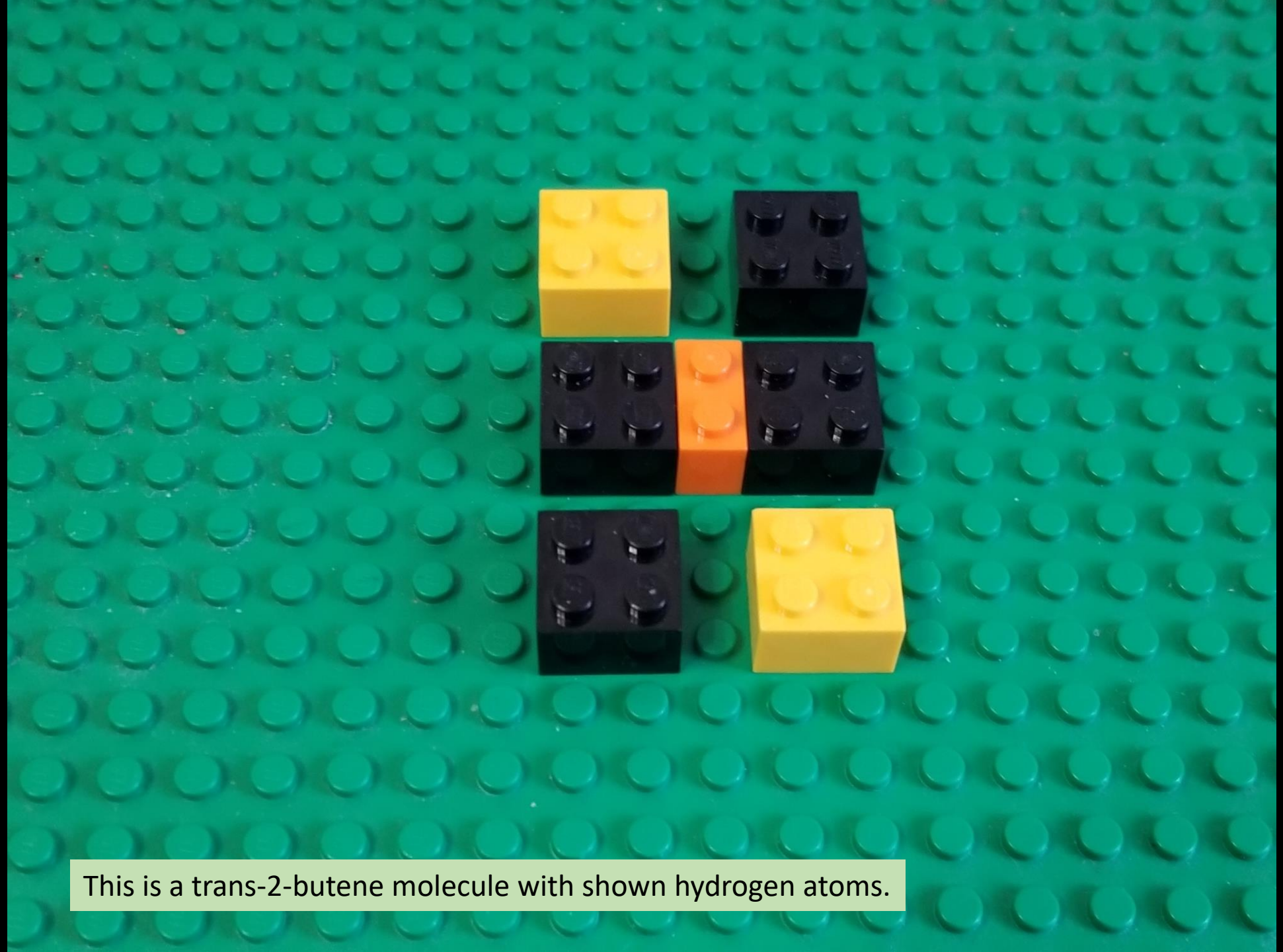




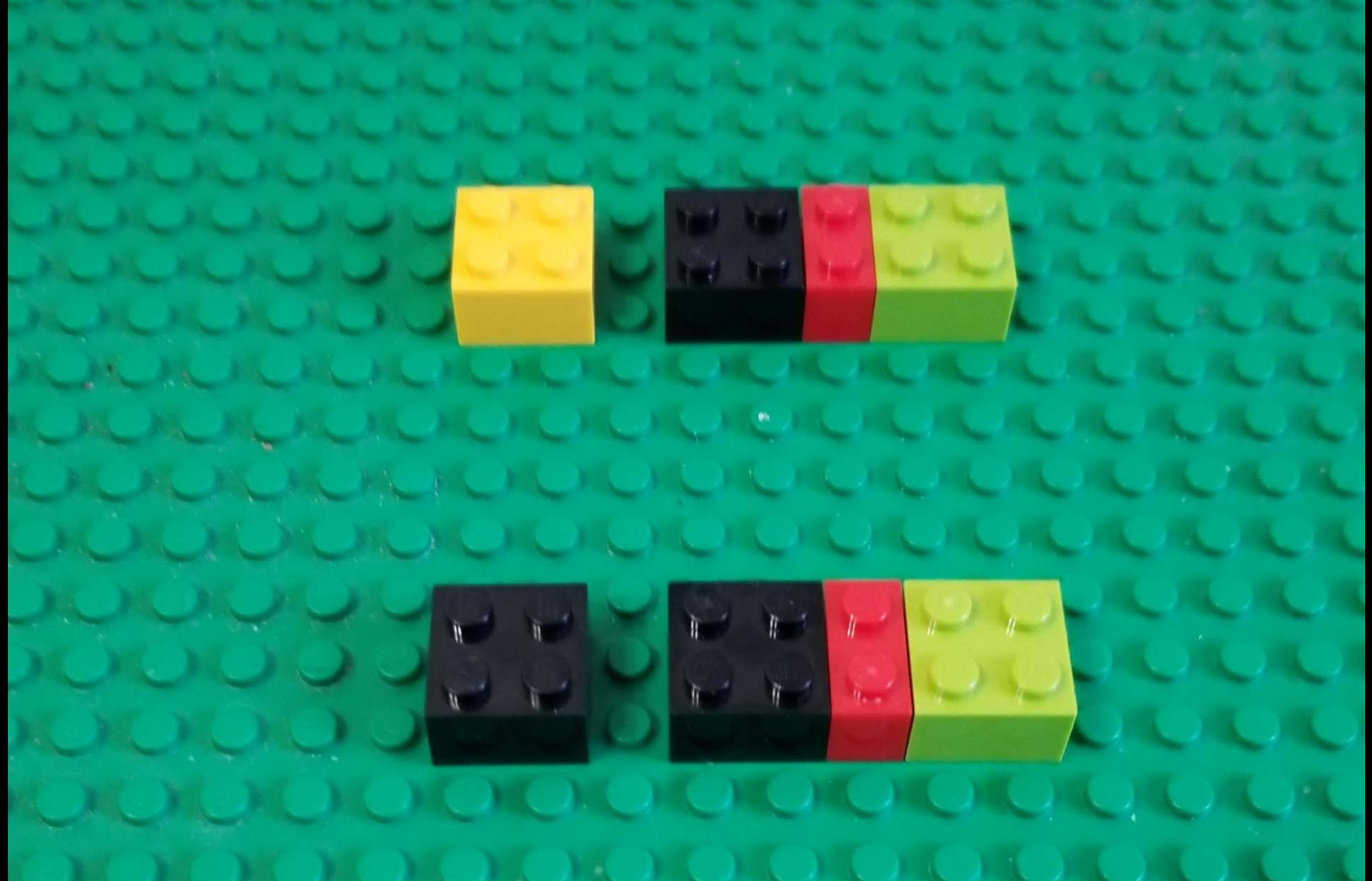
The ordinary bond of butane allows free rotation, and cis-trans isomerism doesn’t appear.



This is a cis-2-butene molecule with shown hydrogen atoms.

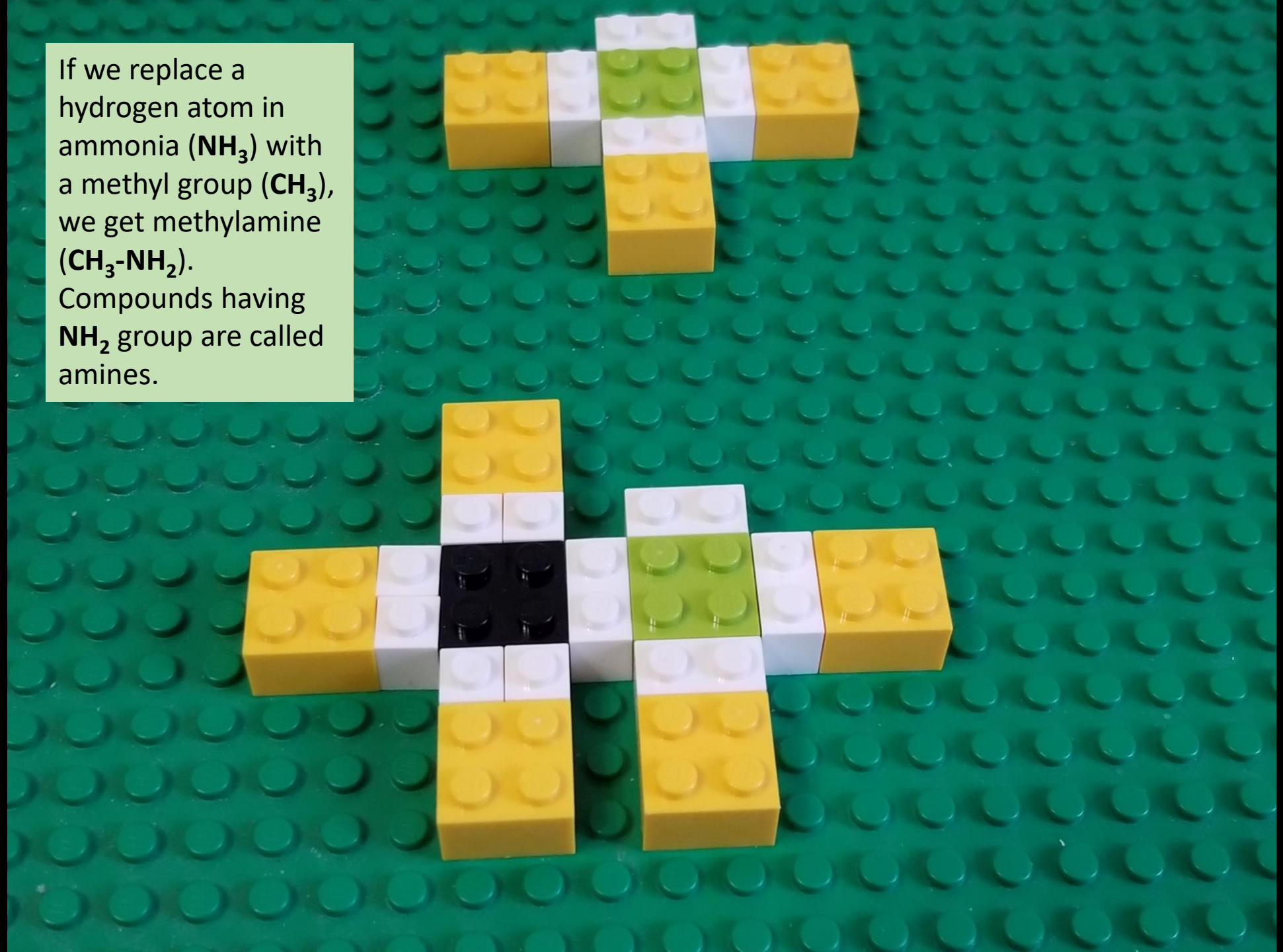


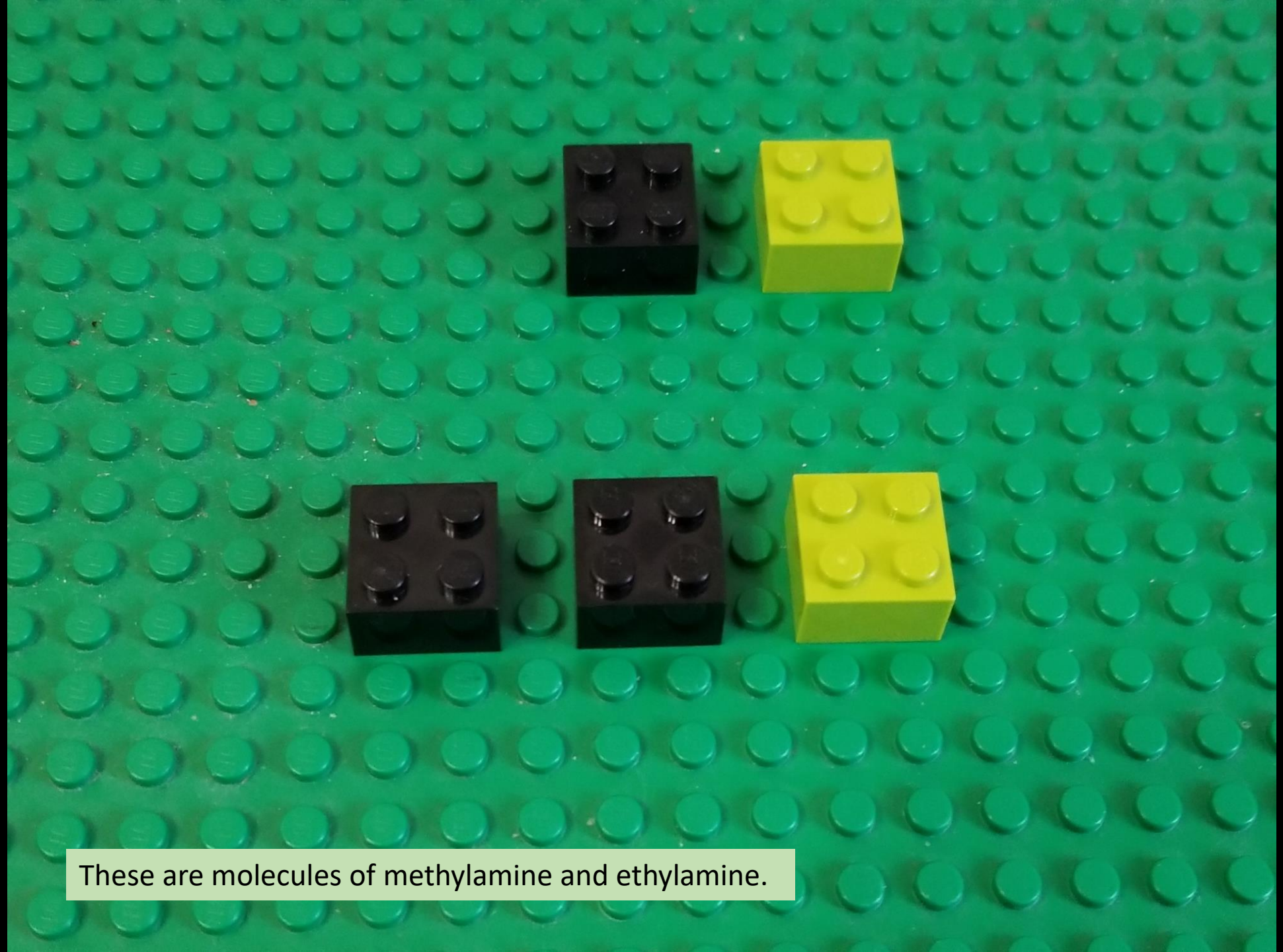
This is a trans-2-butene molecule with shown hydrogen atoms.



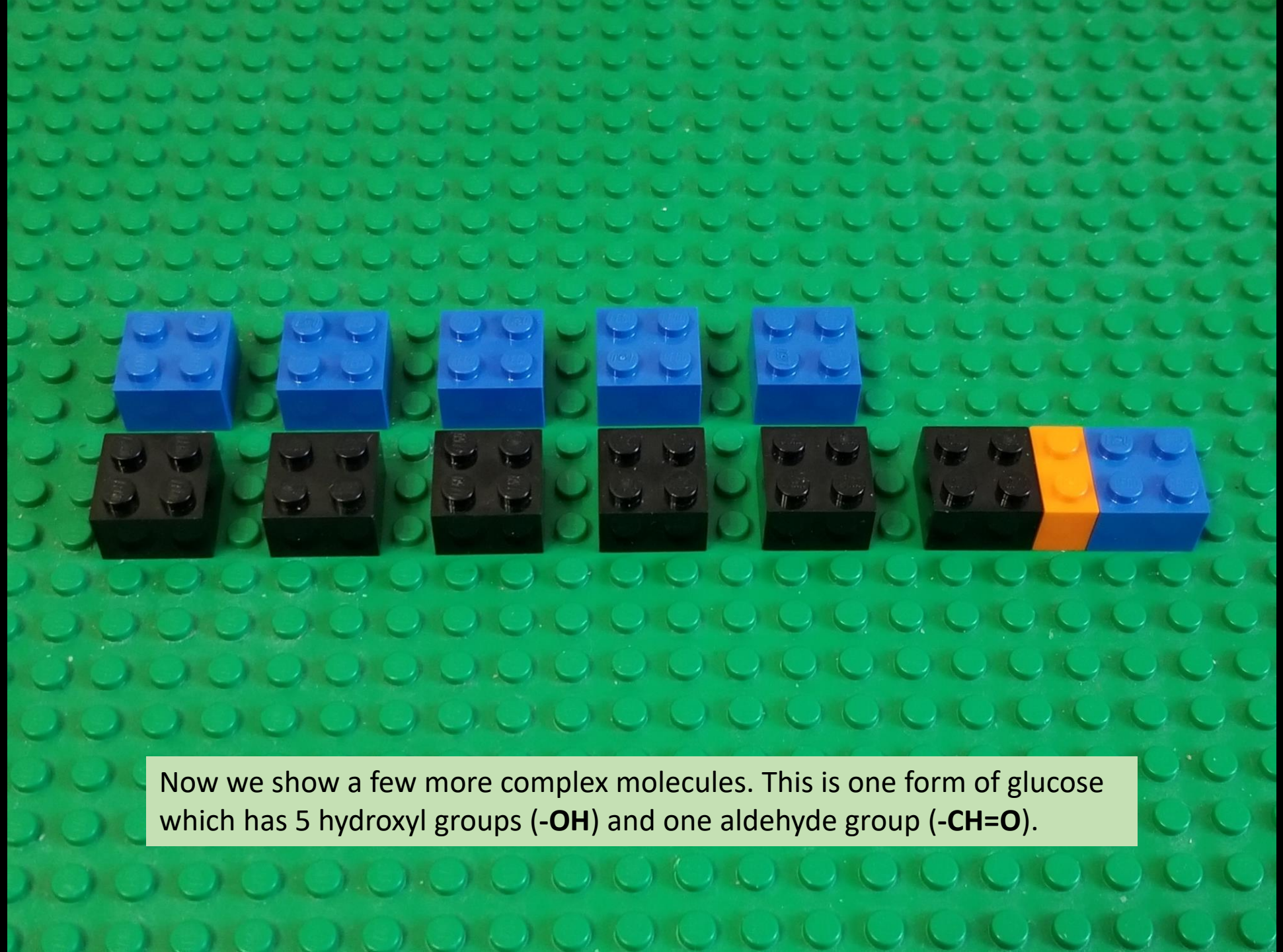
If we replace a hydrogen atom in hydrogen cyanide (**H-CN**) with a methyl group ($\mathbf{CH_3}$), we get acetonitrile ($\mathbf{CH_3}$-**C≡N**). Compounds having **C≡N** group are called nitriles.

If we replace a hydrogen atom in ammonia (NH_3) with a methyl group (CH_3), we get methylamine (CH_3-NH_2). Compounds having NH_2 group are called amines.

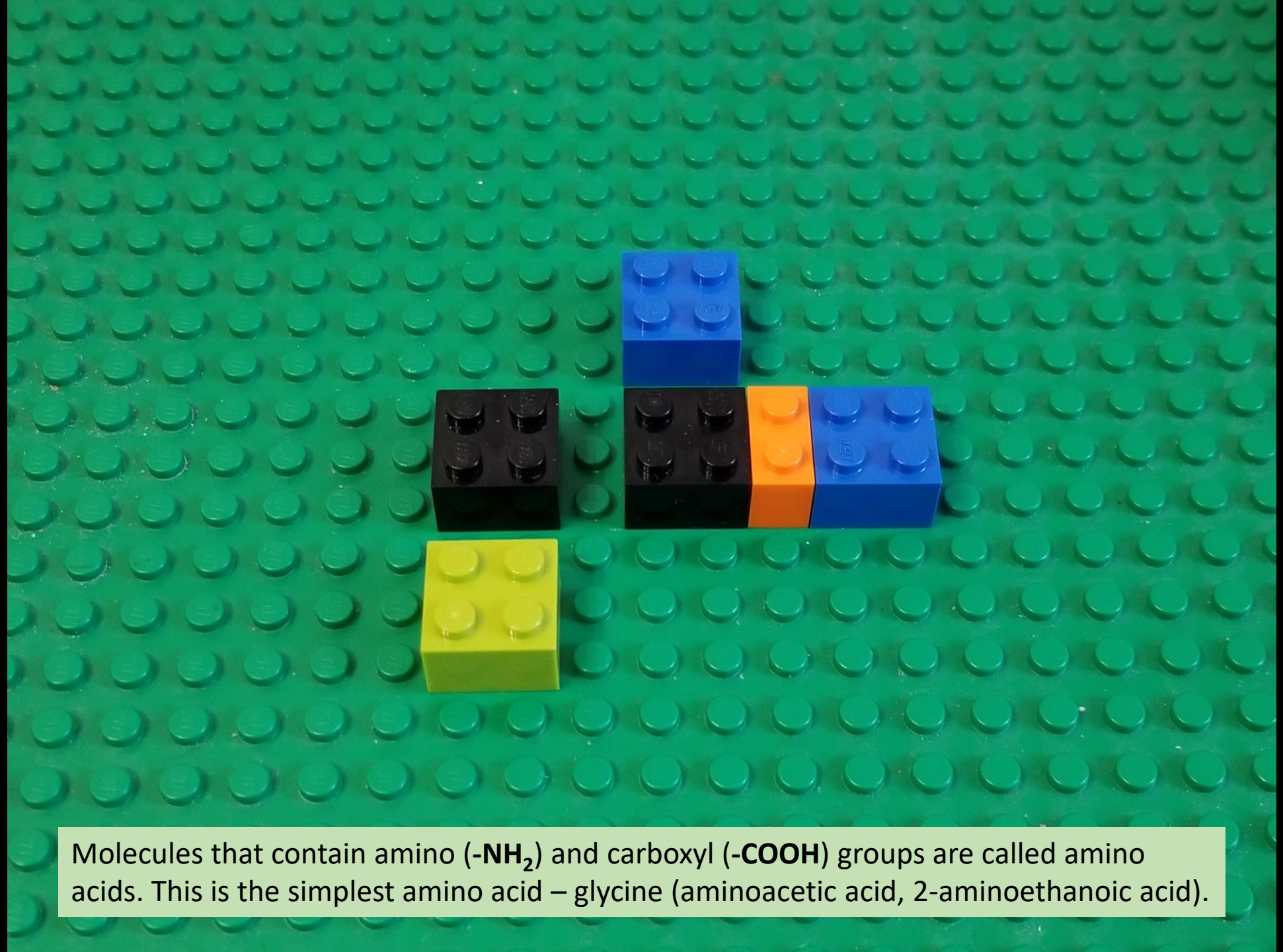




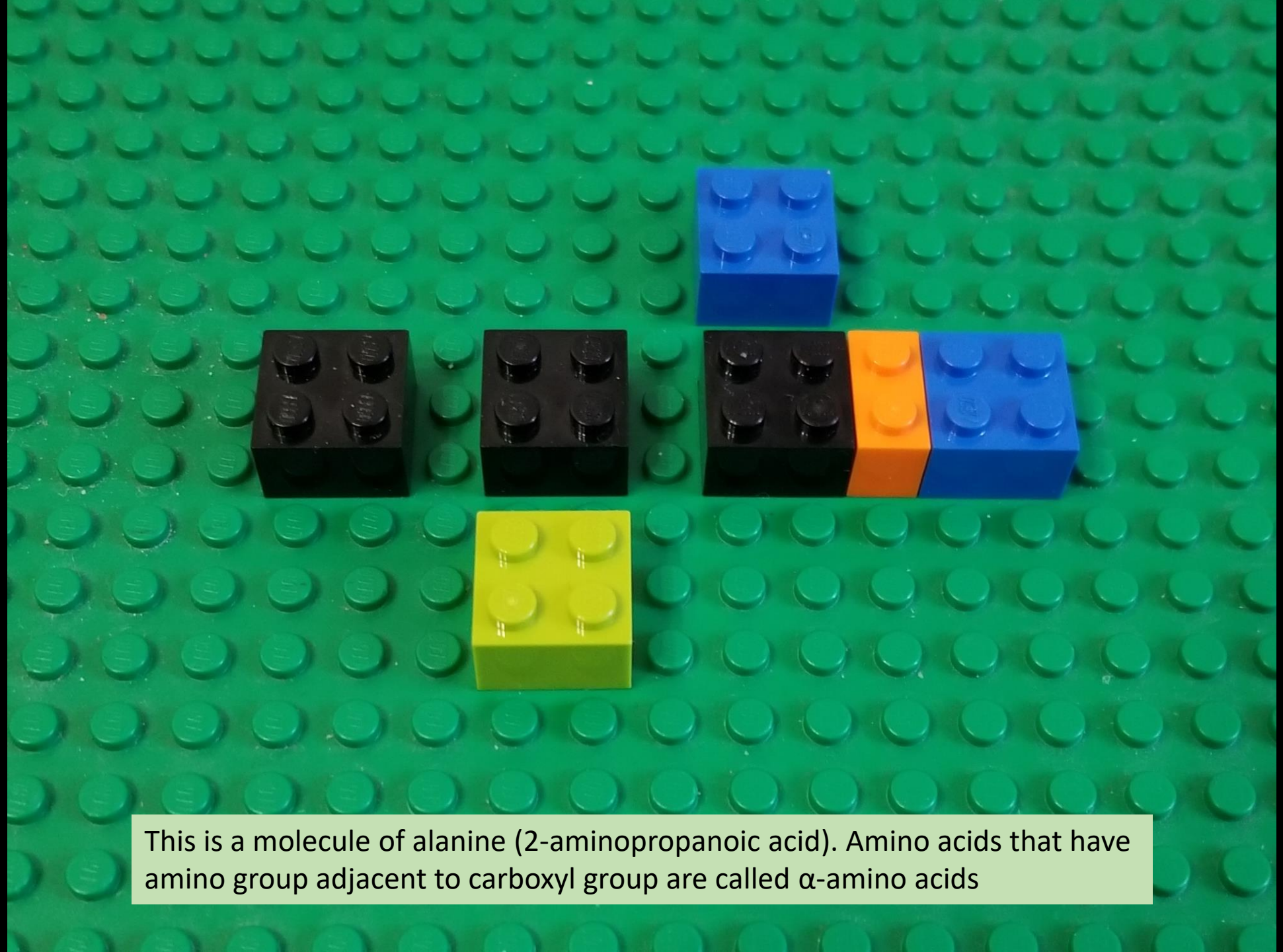
These are molecules of methylamine and ethylamine.



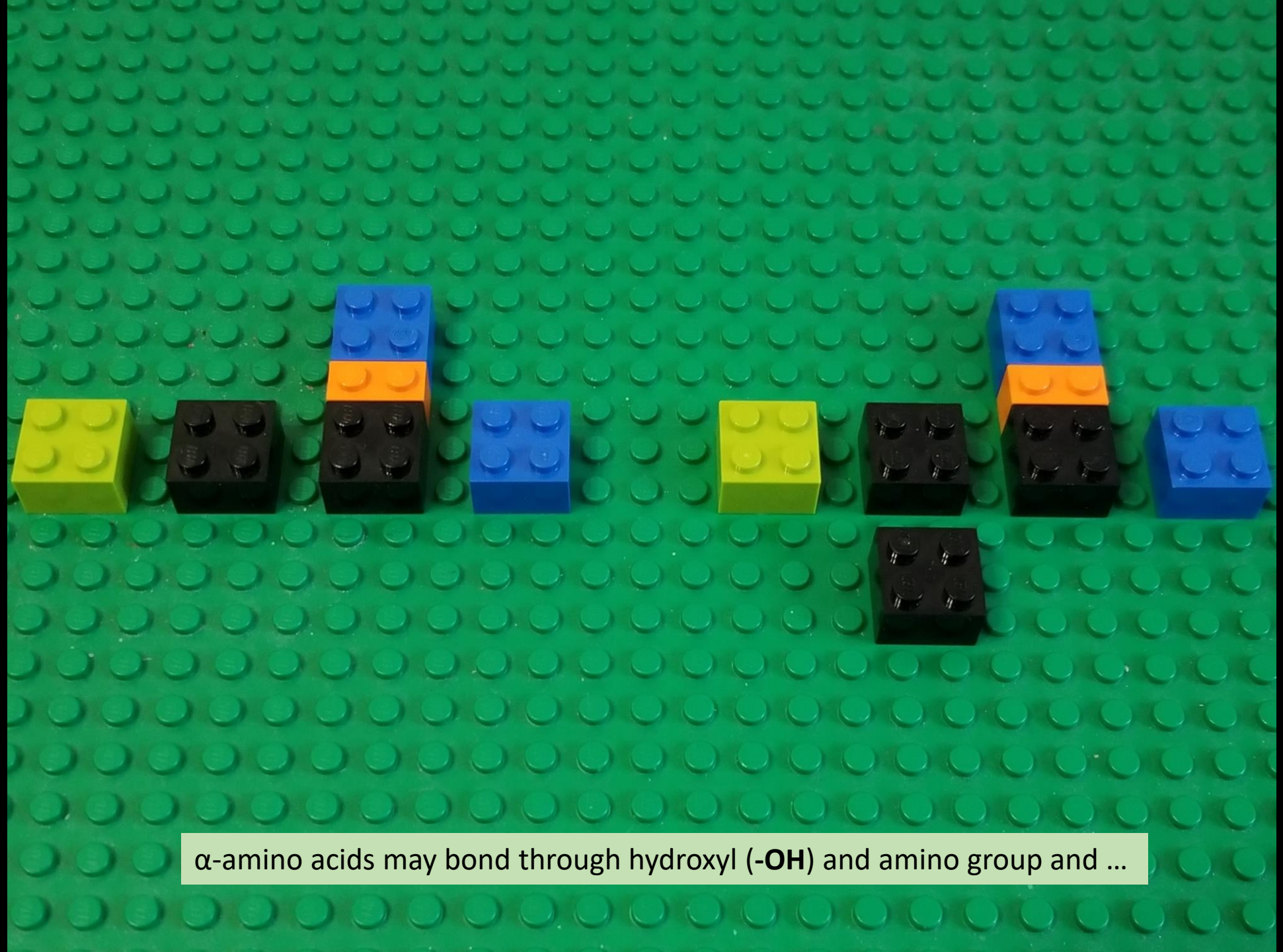
Now we show a few more complex molecules. This is one form of glucose which has 5 hydroxyl groups (**-OH**) and one aldehyde group (**-CH=O**).



Molecules that contain amino (**-NH_2**) and carboxyl (**-COOH**) groups are called amino acids. This is the simplest amino acid – glycine (aminoacetic acid, 2-aminoethanoic acid).

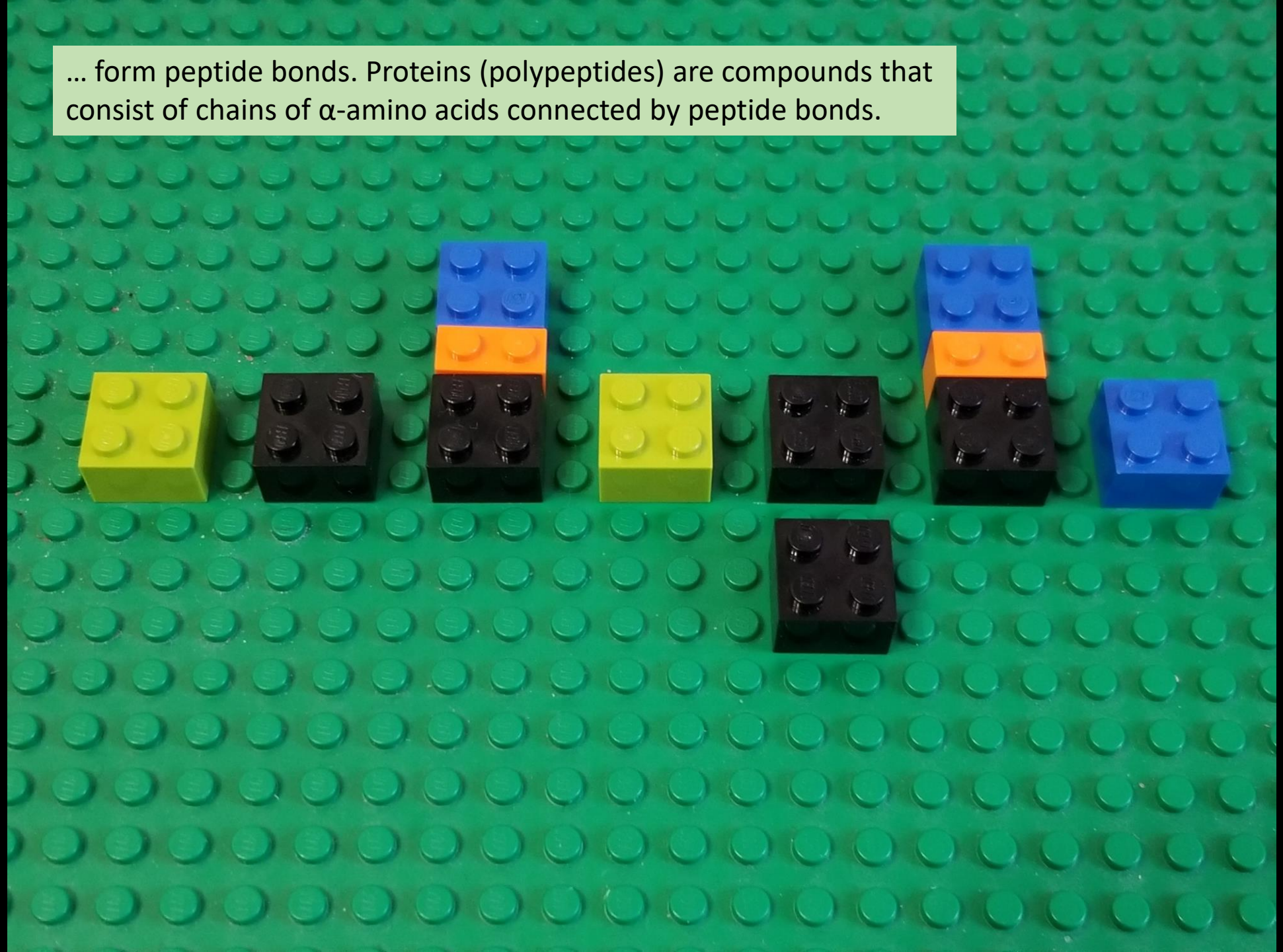


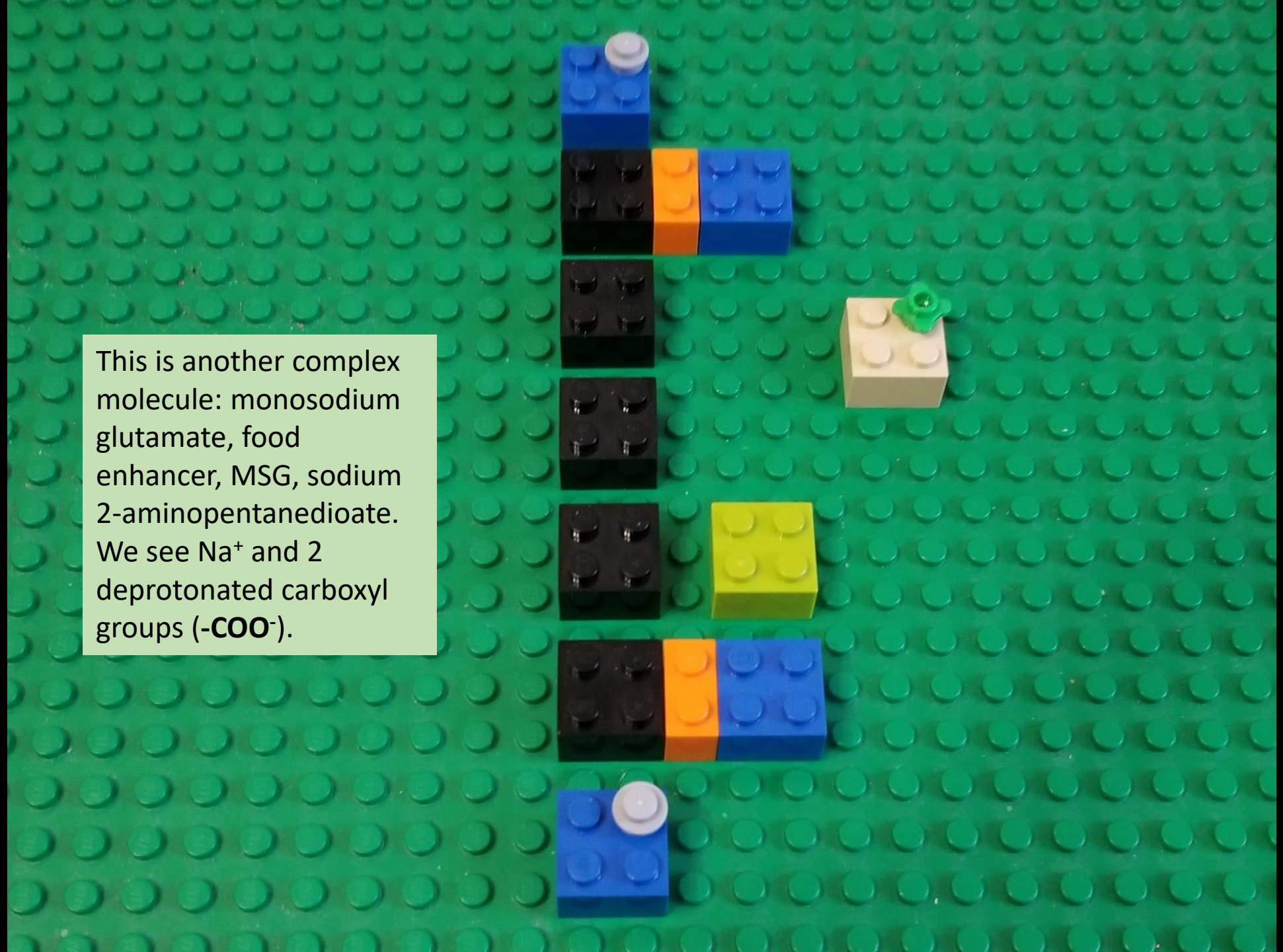
This is a molecule of alanine (2-aminopropanoic acid). Amino acids that have amino group adjacent to carboxyl group are called α-amino acids



α-amino acids may bond through hydroxyl (**-OH**) and amino group and …

… form peptide bonds. Proteins (polypeptides) are compounds that consist of chains of α-amino acids connected by peptide bonds.





This is another complex molecule: monosodium glutamate, food enhancer, MSG, sodium 2-aminopentanedioate. We see Na^+ and 2 deprotonated carboxyl groups (**-COO$^-$**).

Continued with Part 12