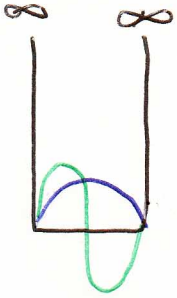
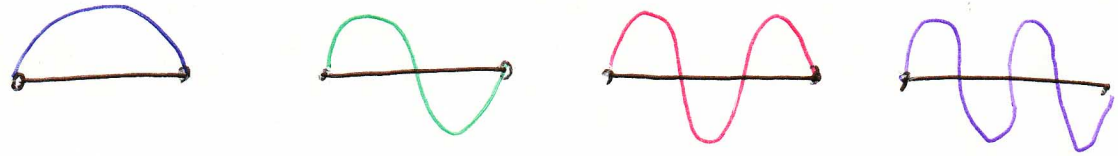
Particle in a box



$y = \sin \omega x$



n=1 n=2 n=3 n=4

0 nodes 1 node 2 nodes 3 nodes

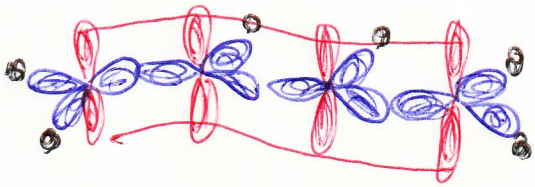
buta-1,3-diene

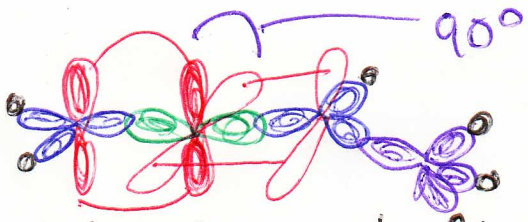
buta-1,2-diene

One to conjugation, the C-C bond in buta-1,3-diene is shorter than "normal".

↑ Carbon

Cumulated diene (no conjugation)





Since the two π bonds are perpendicular, there is no conj.

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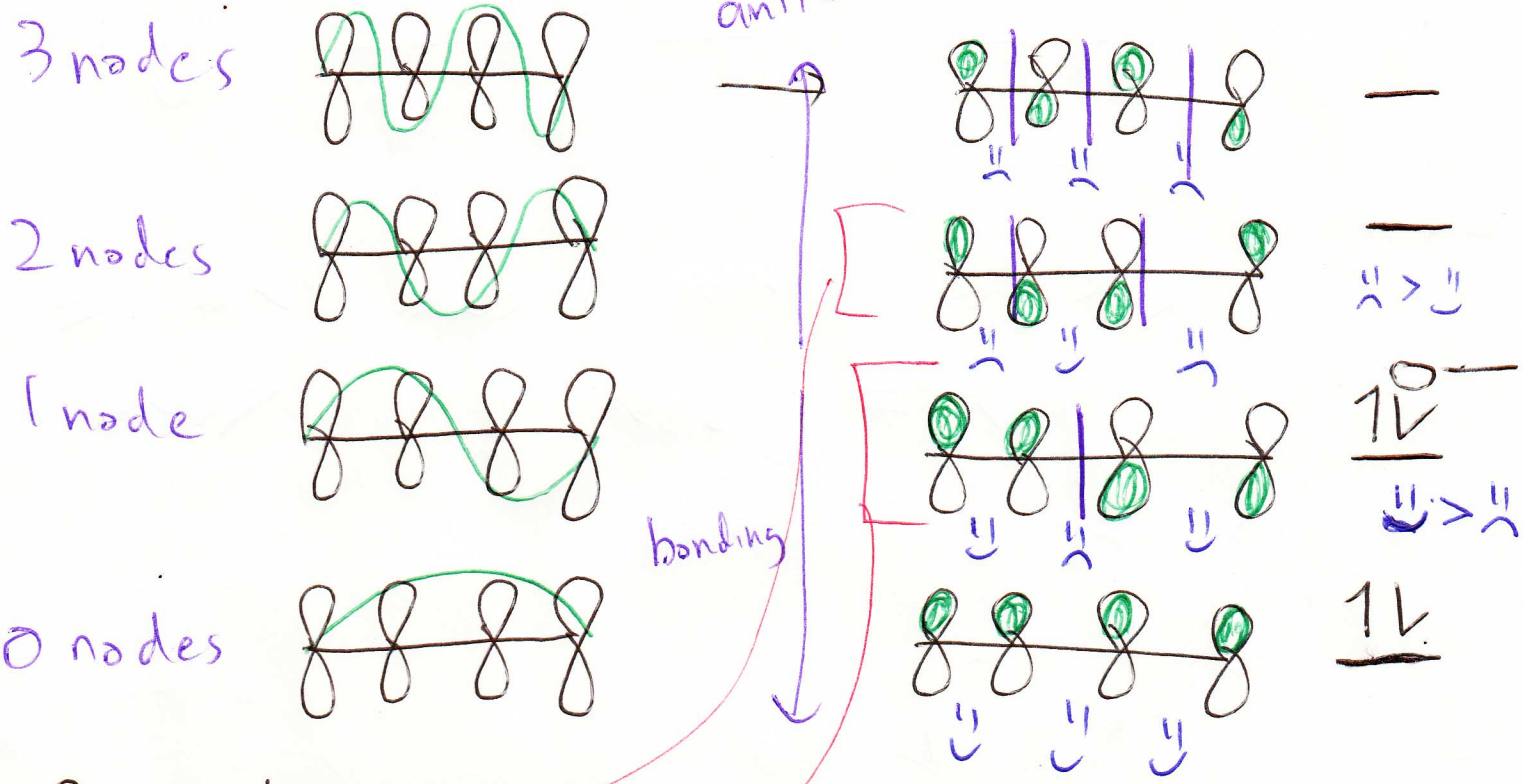
hyperconjugation - the partial donation of e^- density to a neighboring orbital through an interaction that does not involve a bond,

Conjugation - to full delocalization of electron density across multiple orbitals due to bonding overlaps

The # of MOs in a π system is always equal to the # of p orbitals used to represent the system.

→ 4 π e⁻



Bond order = $\frac{\#\text{ of bonding } e^- - \#\text{ of ant. bonding}}{2}$

High-Occupied Molecular Orbital (HOMO)

Lowest-Unoccupied Molecular Orbital (LUMO)