    - Formed by the "end on" interaction of electrons in an s-orbital or a hybrid orbital
    - The electron density is at its greatest on the inter-nuclear axis
    - Stronger than pi bonds
    - **Single bonds are always sigma bonds.**
- Pi bonds
    - Formed by the "side on" interaction of electrons in p-orbitals
    - Low electron density on the inter-nuclear axis, but regions of high electron density on opposite sides of it
    - Weaker than sigma bonds
    - **Double bonds are always one sigma bond and one pi bond.**
    - **Triple bonds are always one sigma bond and two pi bonds with the pi bonds being at 90 degrees to each other.**
- Single bonds are the most stable, have the lowest energy, and have the longest bond length.
- **Resonance structures** have the same sigma bonds but differ in the arrangement of the pi bonds.
    - Are not likely to occur
    - Look at benzene
- **Resonance hybrid**
    - the species that actually exists when there are two or more equivalent structures
    - less energy, which means that it is more stable than any of the resonance structures
- **Resonance energy-** the difference in stability between a resonance structure and the hybrid (aka delocalization energy and stabilization energy)
- **Delocalised pi bond**
    - Allows the pi electrons to spread over more than two nuclei
    - Gives the species a lower potential energy
    - Makes it more stable
    - Overlap of p-orbitals
- **Bond order**- the average of the number of bonds of the different resonance structures
- **Physical properties-** depends primarily on the forces between the particles
- **Bond strength**