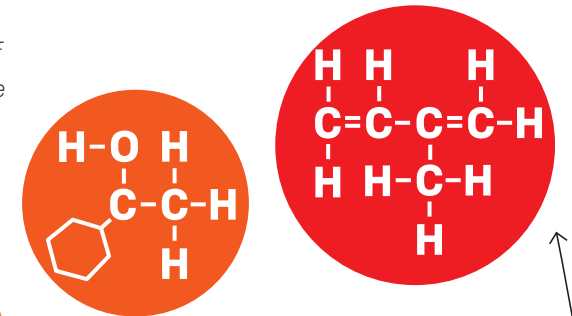
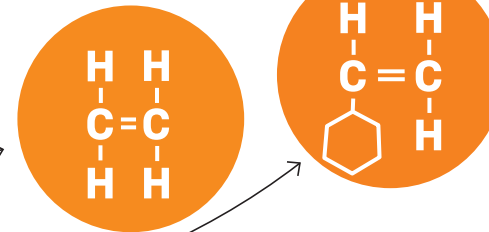


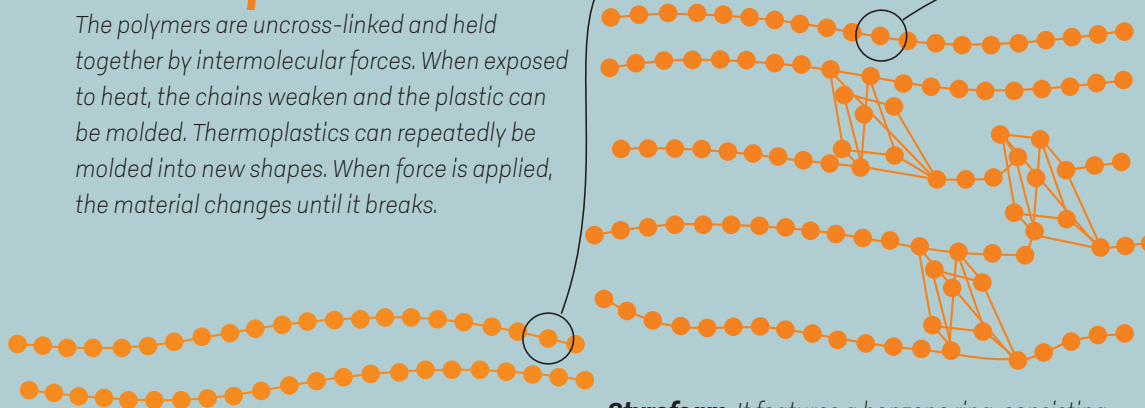
This is a molecule. Molecules are made up of atoms. Different atoms can be connected in very different ways, and this in turn produces different types of molecules.

In plastics, the molecules joined together form long chains – polymers. Polymers can consist of up to 10,000 molecules, and are classified in one of three groups of plastics, depending on how they are joined together.



Thermoplastics

The polymers are uncross-linked and held together by intermolecular forces. When exposed to heat, the chains weaken and the plastic can be molded. Thermoplastics can repeatedly be molded into new shapes. When force is applied, the material changes until it breaks.

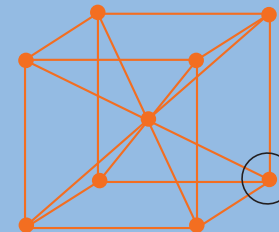


Polyethylene is made up of ethylene monomers and is a thermoplastic. In places, the molecules cross-link several times to form more stable structures known as crystalline thermoplastics. Polystyrene is also sometimes known as

Styrofoam. It features a benzene ring, consisting of carbon atoms connected in a ring shape. The material is foamed into white beads during production, making it a lightweight plastic. That's why it's very commonly used in packaging.

Thermosets

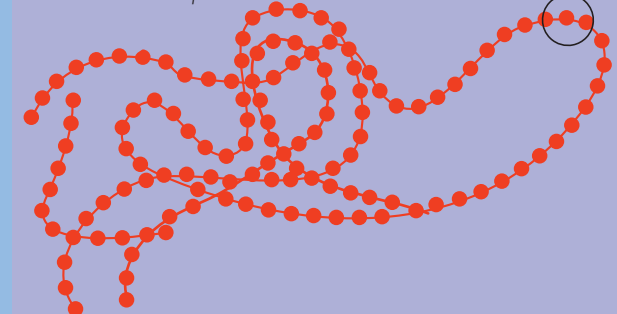
Molecules are arranged in three dimensions, close-meshed, and firmly bonded together with many cross links. They cannot be melted and remolded by applying heat. Even when subjected to force, they only deform slightly.



Bakelite was the first entirely synthetic plastic. It is dark, hard, and still used today for insulation.

Elastomers

Wide-meshed cross-linked molecules that can be shaped or stretched, sometimes considerably, by applying force, but return to their original configuration when the force is removed. We've seen this ourselves in rubber bands and bicycle tires.



Isoprene can be found in many different objects, e.g., as synthetic rubber in car tires.