# Nanotechnology

The word “nano’ comes from the Greek word nannos which means dwarf. In terms of unit of measure it means one-billionth; $10^{-9}$

Nanotechnology refers to the manipulation of atoms and molecules on a micro level to create dimensions that are on a nano-scale. Nano-materials that are created through this process are generally less than 100 nano-meters in diameter. To give an example; a human hair is approximately 80,000 nanometers in diameter.
At this micro-scale the chemical, physical and biological properties of the material are significantly different when compared to their bulk form.

The theory behind nanotechnology was introduced in the 1950‘s but only in the 1980’s did it find some practical application. The past few years have seen this science make great advances; more and more industries are now putting this technology to their use.

## The Velcro effect:

Scientists have developed a process by which they can now build materials, one nano-layer at a time. A combination of these nano-sheets leads to the final product that is very sturdy and strong. This is called the “Velcro Effect”.

## NANO-PLASTIC; THE FUTURE

It is hoped that in the future nano-plastics can replace more expensive materials like aluminum, iron etc. The new generation nano-plastics will reduce the environmental impact; at the same time they will be stronger, lighter and cheaper.
The benefits of using this technology are that it can also be used to derive more efficient performance at lower costs.

## Did you know?

Nanotechnology can be used to boost the production of bio-plastics. Adding cellulose nano-crystals to plastic can increase the strength of plastic by almost 3000 times. At the same time their lifetime in a landfill is only 90 days

Nano-engineered plastic is stronger, more flexible, a better conductor of electricity, provides better UV and flame resistance and lower permeability.

Several countries across the globe, including Canada, are currently involved in extensive research operations in this field. But, as with any new technology there are some stumbling blocks that need to be overcome. Some concerns have been aired regarding toxicity of the nano-materials.