Nanotechnology

Learn about the very small

What is nanotechnology?

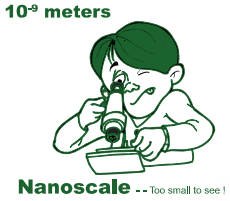
An exciting area of science and engineering that occurs at the atomic and molecular level — at the 1-100 nanometer range. So small, we can't see the structures with our eyes.

What is a nanometer?

One nanometer is 10^{-9} meters (one billionth) or about 3 atoms long! One of your hairs is about 60 - 80,000 nanometers wide!

"Nano" –From the Greek word for "dwarf"

Compare the size of things to the "nanoscale"



What is nanotechnology all about?

The manufacturing and application of materials and systems that have unique properties because of their small size.

1 centimeter

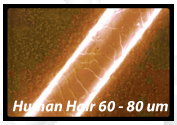
10^{-2} m

1 millimeter

10^{-3} m

100 micrometers

10^{-4} m



Microfabricated gears

Courtesy of Sandia National Laboratories, SUMMiTTM Technologies, www.mems.sandia.gov

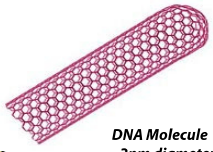
10 micrometers

10^{-5} m

1 micrometer
1000 nm

10^{-6} m

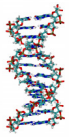
carbon nanotube 3 nm -100 nm diameter



100 nanometers

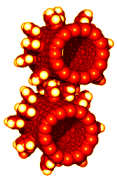
10^{-7} m

DNA Molecule
~ 3nm diameter



10 nanometers

10^{-8} m



Proposed Molecular gears

Water Molecule < 1 nm

It's Biology

It's Physics

It's Chemistry

It's Nanoscience

Learn more on the web at

education.nnin.org

The National Nanotechnology Infrastructure Network