

# The impact of nanotechnology in our lives essay sample

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Nanotechnology is science and engineering at the scale of atoms and molecules. It is the manipulation and use of materials and devices so tiny that nothing can be built any smaller.” It refers to the use of materials with nanoscale dimensions, ranging from 1-100 nanometers. Nanotechnology impacts our lives today in many ways, such as economically, socially, environmentally, ethically, and more.

Nanotechnology is used broadly in many ones’ daily life. Many sunscreens containing nanoparticles of titanium oxide or zinc oxide can absorb and reflect UV light, while being transparent and allowing visible let through. EnviroSystems, Inc. developed a mixture named nano-emulsion of nanometer-sized oil drops mixed with bactericide, used in swimming pools as disinfectants. The oil particles adhere to bacteria thriving in water, making the delivery of the bactericide more efficient and effective. Tennis racket manufacturers introduce highly engineered products. Babolat introduced the VS Nanotube Power racket in 2002, made out of high modulus graphite with carbon nanotubes. They are 100x stronger than steel, yet one-sixth the weight. Nanotech tennis balls is made by coating the ball’s inner core with 20 microns thick of layered sheets of clay polymer nanocomposites – each 1 nanometer thin, so that it remains playable for a long period of time.

Nanotechnology has the potential to have major impact on the environment. An oil spill can be made harmless by the use of nanobots. They have fingers built from nanotubes, which can manipulate the atoms in an oil spill to render it nontoxic. Because of their small size, nanoparticles have more surface available for chemical interactions. Nanoparticles are being studied so that they could remove or destroy toxic substances from the <https://assignbuster.com/the-impact-of-nanotechnology-in-our-lives-essay-sample/>

environment. Researchers at Lehigh University have used nanoscale particles for groundwater remediation. These particles are made of iron, palladium and other noble metals, and have been shown to be very effective reductants for chlorinated hydrocarbons.

Nucleation processes in air and water is possible, so as to the removal of the contaminants from both water and air. Water purification of seawater reverses osmosis, and a reactive surface coating destroys or immobilizes toxic compounds. Cost-efficient ways are provided to minimize the generation of waste from industrial processes. ' Green' chemistry eliminates these wastes using nanotechnology by synthesizing new and improved catalysts at the atomic level for industrial processes, building information into molecules which build new molecules; self-assembling molecules as the foundation for new chemicals and materials; and building molecules in micro scale reactors.

The environment will also benefit from nanotechnology with the improvement of the efficiency of renewable energy. Atoms bonded together specifically could convert water with sunlight to hydrogen, promising a limitless and efficient energy source. Nanoparticle fuel additives have shown to increase the fuel efficiency of diesel engines by 5%, which results in reducing 2-3 million tons of carbon dioxide emissions in the UK. Solar energy can be achieved more efficiently. Enough solar energy hits the earth in a minute sufficient to meet our global requirements for at least a week, but currently, solar cells are costly. Lenses can be used to focus light on silicon photovoltaic, consequently demanding less need of the expensive material.

By decreasing the cost of alternative sources, renewable energy would have a favorable economic position.

Nanotechnology will benefit many industries, including the health and medical industry. Nanoscale devices with a diameter less than 100 nm (1000x smaller than animal cells) can enter the cells to interact with DNA and proteins, as well as monitor and detect diseases or abnormalities (see photo 3). This way, it is possible to detect cancer when the earliest molecular changes are present, so that treatment can be administered sooner.

Surgeries could be performed with tools developed by nanotechnology that are 100x more precise than the sharpest scalpel, ensuring precision and accuracy.

Nanotechnology's impact on the ICT industry would increase as smaller processing chips are produced. "What we are proposing is a new type of computing architecture that is only based on nano mechanical elements," said Professor Robert Blick of the University of Wisconsin-Madison. As the chips get smaller and more powerful, computers will also shrink in size. Some can be as small as bacterium, while having a large storage capacity. However, engineers are finding that mechanical fans can't cool down the chips fast enough or are too big for the device. The smaller you make your devices, the more electrons rush through and the hotter your device gets," said Professor Blick. Heat is now the major factor limiting the size of laptops. Military weapons can be advanced further, with miniaturized weapons, bullets that can be programmed to strike specific targets, and clothes can be

able to store energy to deliver ‘superhuman strength’, such as jumping over a wall with ease.

Despite all the incredible possibilities that nanotechnology provides, there are still limitations to it. While nanotechnology seems to be capable of creating everything, there are physical limits that all technology would stay within. The technology does not have immunities or miraculous powers that allow it to do absolutely anything possible. The nature will not be changed, and nanotechnology will definitely not exempt from the law of physics.

Nanotechnology does provide many positive benefits, but negative impacts also have to be taken into consideration. As much as it can help us, harm could be created as well. Some doctors are concerned about the small size of nanoparticles. If they are released into our body, they could easily cross the blood-brain barrier, a membrane that protects the brain from harmful chemicals in the bloodstream. If molecular manufacturing becomes a reality, and everything can be built by rearranging atoms, global trade might disappear and the economy would be majorly impacted. If particles escape to the environment, damaging effects could be possible, while we would not be aware of what’s happening before us, because of its size.

For example, inhalation would help carry them to our organs, and consequences are still unclear, but health threats will definitely stir up. “Nanoparticles have been shown to be absorbed in the livers of research animals and even cause brain damage in fish exposed to them after just 48 hours.” Familiar objects will have different properties when nanosized, and nanotechnology then might be dangerous. Aluminum, a safe element, can

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explode when it is downsized to 20-30 nanometres. The differing properties can be used to engineer new materials, such as plastic that conducts electricity and coatings that prevent iron from rusting. The manipulation of atoms can make new products that affect people all around the world, depending on how they are used.

Understandably, nanotechnologies would not be inexpensive, therefore not everyone could afford the usage of its benefits. It might increase the gap between the 'haves' and 'have nots'. Examples of nanoproducts have been driven to be a rich-world agenda: sunblock, tennis rackets, tennis balls, laptops and more. There is always a concern that new technologies can be too seductive, being pursued more for their own interest rather than because they offer the best prospect for solving existing problems.

Nanotechnology can do wondrous things that can never be done before. It benefits people all around the world, impacting industries as well. It can be of great uses, but negative impacts are yet unclear. In order to advance in nanotechnology and make the best use of it, research and testing are still required to further understand the impacts of nanotechnology possible.

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