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INNOVATIONS IN SCIENCE, TECHNOLOGY AND ENGINEERING

In the 21st century, many different innovations will either make our world better or destroy it. Each of these innovations is an integral part of our present and future.

3D printing. Technology is gaining momentum, and the companies using it are some of the most dynamic in the world. In addition, 3D printing is used in an increasingly wide range of industries - mechanical engineering, medicine, robotics, aircraft engineering, mechanical engineering, ecology, architecture, decoration, jewelers manufacturing, space engineering, etc. For the production of industrial samples, it is now possible to design in a CAD system and then print directly. Compared to the long process of making traditional models, model printing simply saves a lot of time and resources. At this stage, 3D printing requires some engineering, material science, and printer maintenance skills, but over time it can become an easy-to-use attribute in people's lives on a par with traditional printers or scanners.

Gloves for the mute. Two students at the University of Washington have created gloves that allow mute people to communicate with people who don't understand sign language. The gloves would read the position of the hand in space, curves, and shapes, and then the computer would convert all the data into the corresponding phrase and reproduce it. There were similar inventions before, but the difference between these gloves is that they fit easily in the pocket.

Exoskeleton and sensory prostheses. Here you can work in both directions - industry and health care. People with disabilities or motor system problems, or those who are only temporarily disabled, will soon be able to move independently with an exoskeleton, and sensory prostheses will completely replace a lost limb, transmitting signals from the brain and providing brain signals about touch, heat, etc. In industry, exoskeletons will help lifters lift loads that a human cannot lift on their own, saving time and warehouse space and doing more precise work. In addition, the technology can be used in defence, emergencies (fires, natural disasters), and other necessary areas.

Nanotechnology. These are manipulations of matter at the atomic, molecular, and supramolecular levels. The invention of nanotechnology has allowed us to transform complex technologies into simple, compact forms. Although there is still great potential for discovery, nanotechnology has undoubtedly added a new page to human life. From DVDs to hotel pools and sunglasses, nanotechnology is everywhere.

Robotics. Robotics is a branch of science that developed in the 21st century. Her greatest contribution was a humanoid machine commonly known as a "robot". The machine works with its programmed intelligence and artificially implanted thoughts and performs automatic functions. Robots are used in manufacturing, defence, maintenance, intelligence, and security. As robots continue to evolve and improve, the distinction between robots and humans is quickly blurring. ASIMO can distinguish people and interact with them and is currently on display at Disneyland.

Hypersonic transport. Scientists have invested a lot of time and effort to achieve time efficiency. They have developed technologies that provide the least time consumption with greater productivity. Hypersonic transport is one of the greatest inventions of the 21st century in terms of efficiency. Hypersonic transport enabled mobility at incredible speeds. These vehicles are capable of covering long distances at four times the speed of sound.

Graphene. The existence of the first known truly two-dimensional crystal (with a crystal lattice one atom thick) was first experimentally confirmed in 2004 by scientists Andrei Geim and Konstantin Novoselov, and in 2010 they received the Nobel Prize in Physics. Graphene is a film of graphite (crystallized carbon) one atom thick. It could not

be obtained for a long time due to instability. Geim and Novoselov used an oxidized silicon substrate to stabilize the 2D film.

Graphene is very strong yet extremely flexible. It conducts current, and the electrons in it move faster than in all known materials. In particular, it is 100 times faster than silicon, from which modern processors are made. Using graphene, it is possible to create ultra-thin filters, touch displays, sensors, highly efficient catalytic cells, nanochannels for working with DNA, and components for high-precision electronics. Graphene chips will increase the performance of computers and speed up data transfer, making devices more powerful and smaller.

High-density batteries. New standalone devices need a lot of power to go as long as possible without an outlet. At the same time, the batteries must be compact and safe - for example, they must not explode when exposed to high heat or mechanical damage.

A team at the Center for Battery and Energy Storage Technology (BEST) in Pennsylvania has created a safe and powerful lithium-ion battery that will allow an electric vehicle to travel up to 1.6 million kilometres. During tests, nails were hammered into it to cause a short circuit. But the temperature of the damaged cell increased by only 100 degrees Celsius - and in a conventional battery, the difference would be 1,000 degrees Celsius.

Samsung researchers also made a breakthrough: they developed a solid-state lithium metal battery with a density of 900 Wh / l. It is 50% more compact than existing batteries and is designed without the use of liquid electrolytes. Over time, the battery does not degrade - the amount of charge that it can accumulate remains the same. This is only a small part of what people have invented in the 21st century. Further, many new and amazing discoveries await us, which we will use in our everyday life.

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