We are team 11110Z. Our names are Payton Colbrook, Kobe Hoffman, Megan Carr, and Evelyn Hausrath-Moret. We were a team the year before, and since we work so well together, we decided to be a team this year too.

The STEM career that we feel is interesting is biomedical engineering. A biomedical engineer is an engineer who works to design prosthetic limbs and organs. They also maintain the medical equipment they use, deem if it is safe to use, and train other physicians on how to use it. They design medical equipment and software.
There are many fields in this area of engineering. Some bioengineers are more involved in statistics so they can understand the brain and heart. Others may be more involved in software and running the medical instruments, and even more work with chemistry to conceive new medicines.

Most biomedical engineers work full time, but the needs of clients, managers, and colleagues may call for the need to come in at odd hours. Several biomedical engineers work over 40 hours a week.

The U.S. Bureau of Labor Statistics, Occupational Outlook Handbook estimates that in May 2019, the median annual wage for biomedical engineers was $91,410. Half of the biomedical engineers earned less than $91,410, and the other half earned more than $91,410. The highest 10% earned more than $148,210 annually. The lowest 10% earned less than $55,280 annually.

Competitive robotics is preparing us for this field by helping us learn the basics, we'll explain. In competitive robotics, we have to learn how to build robots, program robots, and fix robots. It also teaches us how to adapt to certain situations. As a biomedical engineer, you have to know these key things to be successful. For instance, in robotics, we have to use motors and follow measurement guidelines, and create robots. As a biomedical engineer you have to create equipment, and make prosthetic limbs and organs.

Competitive robotics has us learn where to connect pieces to make the robot move, as a biomedical engineer you have to know where the best place is to connect the prosthetic limb or organs. We know that connecting a single piece wrong can make the whole thing wonky. In conclusion, competitive robotics is preparing us for this field by teaching us how to communicate with others, knowing how to fix pieces, and understanding that we have to build things on our own, and fix them.

To be successful as a biomedical engineer, you must both be analytical, detail-oriented, and strong in biology and chemistry. Strong math, science, and technology skills are also critical to a successful career in biomedical engineering.

A bachelor's degree is a basic requirement for entering the field of biomedical engineering; many biomedical engineers have a background of engineering specialty, like electrical or mechanical engineering, in addition to biomedical training. Common coursework in a 4-year engineering program that will prepare you for a career as a biomedical engineer including biomedical instrumentation, biomechanics, physics for medicine, therapeutic medical devices, and biochemical engineering. Many employers expect biomedical engineers to have a master's degree.

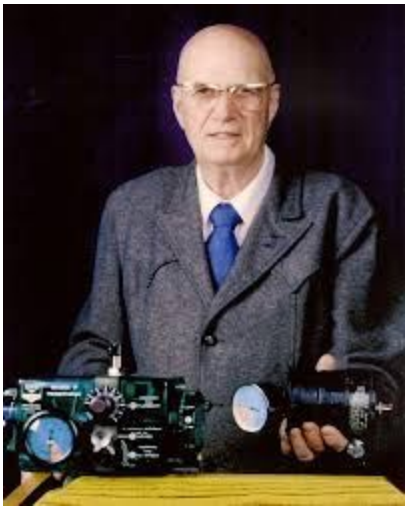
We believe this career will evolve a lot. In the next ten years, we believe a lot will change because technology such as prosthetics, computers, and AI is always growing. As well as medical research. Think about how scientists have already cured one man of HIV. Things like that are always getting better and more advanced.

One way it could evolve is by robotic devices taking the place of surgeons. They could be controlled by humans and doing most of the work. It makes sense to have robotic machines working on humans, especially if the robotic parts are smaller than human hands. Meaning that the robotic machine would be able to get into smaller parts of the human body.

If you want a more technical way this career will change. Here you go. According to the US Bureau Of Labor Statistics, this career is expected to grow 5% from 2019-2029 which is faster than all occupations. Which will increase the number of technologies for medical devices and machines. Which proves our point that with more people working in this field unbelievable things are going to happen with medical equipment.

We contacted Dr. Brian Hagen. He has a PhD in Cellular and Molecular Pharmacology and Physiology. We knew he could help.We are so lucky that he responded and this is what he said. He thinks this field of expertise will have new highly-effective drug delivery methods, the ability to kill specific cell-types using “external non-invasive directive electromagnetic energy.” He also believes that doctors could use 3D printed functional organs “made rapidly from patients cells.” Lastly he believes that biomedical engineers will create some amazing prosthetics. “Along with the incorporation of artificial intelligence and improved autonomy to all intelligence” He thinks all this will happen in the next ten years.

Also, when talking to Dr. Brian Hagen we discussed some advancements in research so we know what the future could be like. He said some of the biggest advancements in research have been the idea to use a patient's cells to grow T-cells (the cells that target the infected cells) that can target cancer cells in their own body. Another amazing advancement in the research for the future is, “Open-source technology platforms for sharing of plans, instructions, 3D files and codes.” Which would be amazing for doctors and scientists to communicate. The last advancement in the research was the idea of programmable technology for a reasonable price. Which would be great for the hospital and surgeries. As you can tell, advancement in research will lead to amazing things that will change the future.



A well-known person that works in the field of engineering that inspired me to research this career is Forrest Bird. Born in Stoughton, Massachusetts in 1921, Bird started as an aviator and took his first solo flight when he was 14. Several years later he joined the Army Air Corps. During World War 2, Bird became a technical air training officer. In that time, planes were being built that could fly higher than ever before. This inspired him to research breathing techniques at higher altitudes.

An Air Corps physician gave him a book on mammalian pathophysiology. He immediately became rooted in that subject. Bird attended several medical schools, and the information he collected led him to develop a prototype Bird Universal Medical Respirator for chronic or acute cardiopulmonary care. In 1954 he founded Bird Products Corporation to materialize and market his device.

Four years later, he traveled around to different medical schools and tested his device on the sickest patients that were going to die. Most of the patients he tested his respirator on survived. Instead of making his invention inaccessible to the lower class, he founded Percussionaire Corporation to manufacture and distribute Bird's Intrapulmonary Percussive Ventilation and Volumetric Diffusive Respiration. That made it accessible to the public. Today the company is still running and has teamed up with CVS to deliver medicine.

He inspired us to research this career because no matter how many times his test patients died, he kept on going and created something extraordinary. He showed extreme perseverance and was one of the worlds greatest biomedical engineers.

Citations:

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Scientist Dr. Brian Hagen. He has PhD in Cellular and Molecular Pharmacology and Physiology.