



Agricultural Engineer

Brought to you by Team 1705D

Robotics is used for many things. It is used for small objects, such as phones or computers, to BIG things, such as rocket ships.

VEX IQ is just one of the many things in-between small and large robotics, and it has grown in interest by kids around the world. One of the many things that we find exciting when it comes to VEX IQ is the Career Readiness Challenge. The Career Readiness Challenge can help teach kids how to plan for their future job and allows them to use their imaginations when it comes to creating new robotic discoveries, since kids have the biggest imagination when it comes to anything.

Our team has chosen to do a project combining robotics and plants. We have all decided to explain how we, as Agricultural Engineers, can design a backyard sized Automated Greenhouse. First, we need to explain how the architect of the greenhouse, an Agricultural Engineer, relates to Vex IQ. Vex IQ is helping prepare us for our future by teaching us how to code. Coding will help us because in the future, more and more jobs will be automated by robots so there will be less room for error. With programming we can make sure that no one gets a serious injury in the workplace. If we learn to program at a young age, we will

have more time to perfect our skills and to learn different types of code that will help in different situations. According to The Wikipedia Page for Technological Unemployment, they said that 59% of business processes will be automated soon. In 2017, a report was made by the McKinsey Global Institute and they watched over 800 different jobs in 46 countries and they estimated that 400 million to 800 million jobs would be lost to automation in the workplace. If we are going to want a job in the future, we are going to need to get a job that won't be replaced by robots or get a job that makes things automated. Just as the old saying goes, if you can't beat them, join them.



Image 1- <https://onrobot.com/fr/node/173> The first image shows an example of an automated greenhouse that already exists in the world.

Greenhouses are essential when it comes to our health and needs. Greenhouse's are used to keep plants safe from harsh weathers, such as the cold and heat. They also provide a safe place for the plants so animals can't get to them. But they can be such a hassle, having to water your plants and make sure your soil is not contaminated. Therefore, we all need a backyard-sized automated greenhouse.

What is an automated greenhouse?

An automated greenhouse is a fully robot-operated greenhouse. But, as you can see, it is such a large building that nobody could ever have one in their backyard (Image 1). That is why Agricultural Engineers have come up with a backyard-sized automated greenhouse.

The greenhouse will be able to sense when the soil is contaminated and when animals are in the ground around the roots of the plants. It will send an alert to your phone when any of these things occur.

You can use a garden hose to supply water to the greenhouse or you can make it rain-generated. When the water is low in the tank, it will send an alert to your phone to fill up the tank, it will do the same with the battery for the greenhouse motors operating the ventilation shutters.



Image 2- <https://www.enduraplas.com/products/water-storage-tank/> This is an image example of what the water tank would possibly look like.

We would build this special greenhouse quite similar to a normal greenhouse. Like any other greenhouse, we would start with the framing, covering, doors and hardware. We need to make sure that it can hold the weight of the mechanics, and it must last for a long period of time. We would have to make sure that the frame is made out of a strong material, like aluminum, so it doesn't collapse in bad weather such as snow, rain or wind. We also have to make sure that the mechanics inside the greenhouse are waterproof so they can keep working with high humidity around it. The wires would have to be covered and contained so other components inside the greenhouse don't break it. Then we would power the greenhouse with an eco-friendly design. We would collect the water for the

greenhouse from rainwater. We would collect the rainwater from the roof of the home and the roof from the greenhouse. The water would then be purified to make sure that the water is good for the plants. We also would have to have an option to add fertilizer or vitamins to the plants to increase the size and health of the plants.

We would power the greenhouse with either a solar panel, or a rechargeable battery especially for the people that live in a place with a low amount of sun where solar panels wouldn't work well. You can charge the battery with the power from your own home, so you aren't using excess power that you aren't already provided. You can check on the status of the battery, or water collected from an app on your phone so you can see how your greenhouse is doing anywhere around the world!

With this, people would be able to have a decent greenhouse that does mostly everything for you! Since this greenhouse will be completely solar powered and energy efficient, this greenhouse will also be able to have all this technology in it without anything bad going into your plants, and in the air. An Agricultural Engineer can make the World a better place by custom designing greenhouses for everyone.

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Sources

(Image 1) Example of fully automatic GreenHouse:
<https://www.hoveintl.com/full-automatic-system>

KHow to build a greenhouse:
<https://www.rimolgreenhouses.com/learning-center/10-steps-to-building-a-greenhouse>

Example of a greenhouse rain collector:
<https://www.enduraplas.com/products/water-storage-tank/>

Wikipedia for Technological Unemployment:
https://en.wikipedia.org/wiki/Technological_unemployment#:~:text=On%20average%2C%20they%20said%20that,to%20robotic%20automation%20by%202030.