



Beyond  
**BIG**

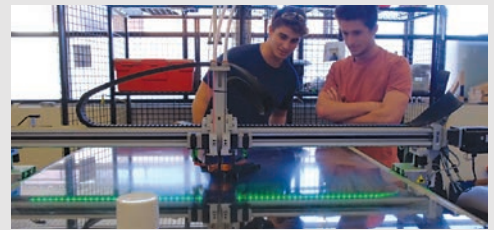
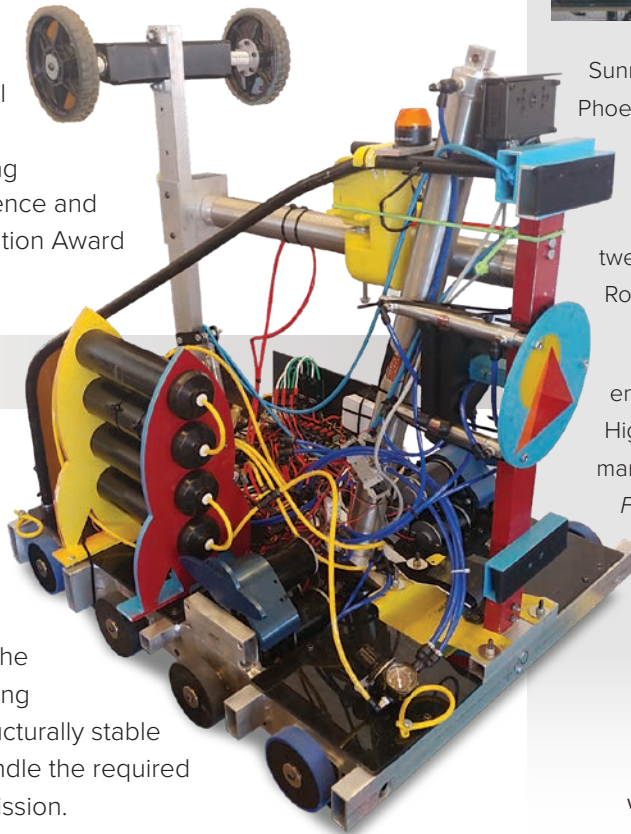
# Sunnyslope High School Case Study

## High School *FIRST* Robotics teams takes home award with help of 3DP printer

Advanced students within the science and engineering curriculum at Sunnyslope High School had the valued opportunity to participate in the *FIRST*® Robotics competition. In order to participate, this team of students had to design and build a roughly 120-pound robot, nicknamed Osiris, implementing the rigors of science and technology. Structural and protective components for the robot were 3D printed, allowing students to gain hands-on experience and ultimately take home the Visualization Award for the best looking Robot!

### Why BIG

The science and engineering department at Sunnyslope High School chose the large format 3DP printer for the potential to enhance the classroom experience, and supplement the design and build of their robots. The printer is capable of mass producing smaller parts, as well as large, structurally stable components that were able to handle the required functions of the *FIRST* Robotics mission.



Sunnyslope High school is located in Phoenix, Arizona. Their engineering and science department sponsors the robotics club, where advanced students from grade nine through twelve participate in the *FIRST* Robotics competitions.

Tyler Bolen is a science and engineering teacher at Sunnyslope High school, as well as the project manager and sponsor for their *FIRST* Robotics team.

[sunnyslope.guhsdaz.org](http://sunnyslope.guhsdaz.org)

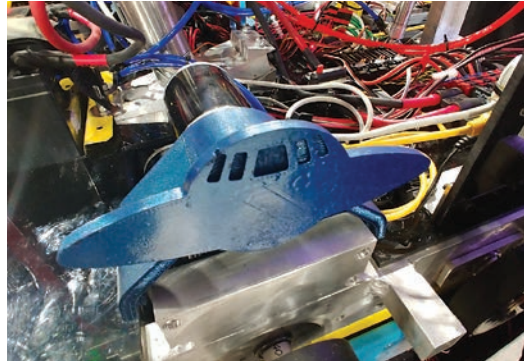
[www.firstinspires.org/robotics/frc](http://www.firstinspires.org/robotics/frc)

[www.youtube.com/watch?v=Mew6G\\_og-PI](http://www.youtube.com/watch?v=Mew6G_og-PI)



## Why 3DP

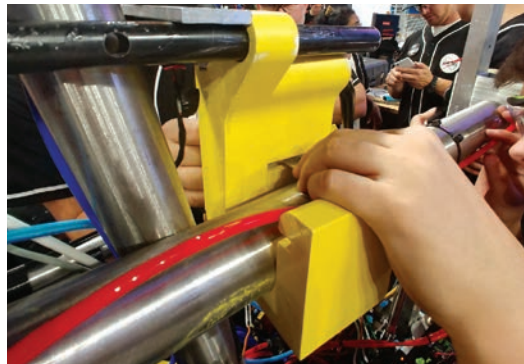
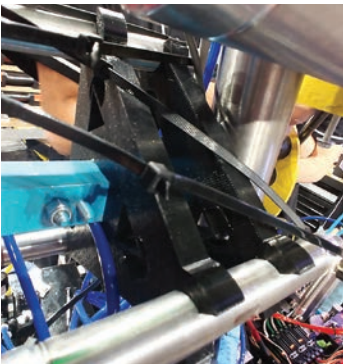
During a Solidworks training course, Engineering Science faculty Tyler Bolen met with 3DP, who was giving an on-site demonstration of their large format 3D printer and its capabilities. Following the course, one of Tyler's colleagues acquired the 300 series printer from 3DP, and had a lot of positive feedback about the machine. After a year of hearing good reviews about the 3D printer, Sunnyslope High School acquired their own 300 Series printer.



## Results/ROI

Tyler states that the machine "was a little intimidating at first," but has since gained greater confidence in the process. He also goes on to say that the students are essentially doing all of the 3D printing. Tyler has given them instruction on how to use the software, and now they are capable of taking care of the details that go in to a successful print, including the CAD modeling

Since acquiring the printer, their cost per project has been greatly improved, and has helped to significantly bring down the overall expenses for the robot. Tyler estimates that their cost savings is "easily 25 - 30 percent."



## Tips/Community

As Tyler has continued to improve his skills on the 3D printer and software, the speed of his prints has vastly increased, and allowed his robotics team to incorporate more parts into the robot.

## FIRST® Robotics Competition



Photo Credit: Adriana Grosman

FIRST is the world's leading child-serving nonprofit aimed at advancing science, technology, engineering, and math (STEM). The FIRST Robotics Competition is one of their programs that looks to inspire innovation and leadership through engaging, hands-on robotics challenges, and nurture powerful mentorships between students (grades 9-12) and STEM professionals.

The challenge is for high school teams to use sophisticated technology to build and code industrial-size robots for a challenging field game. Each team develops a brand, raises funds to meet its goals, and works to promote STEM in the local community.

Through district and regional events, student teams build 120-pound robots of their own design to compete for prestigious awards and a coveted spot at the FIRST Championship. The entire journey helps students learn real-world engineering concepts, build confidence and workforce skills, and connect with professional team mentors and sponsors.



Photo Credit: AutomationDirect