

NASA Middle School Program

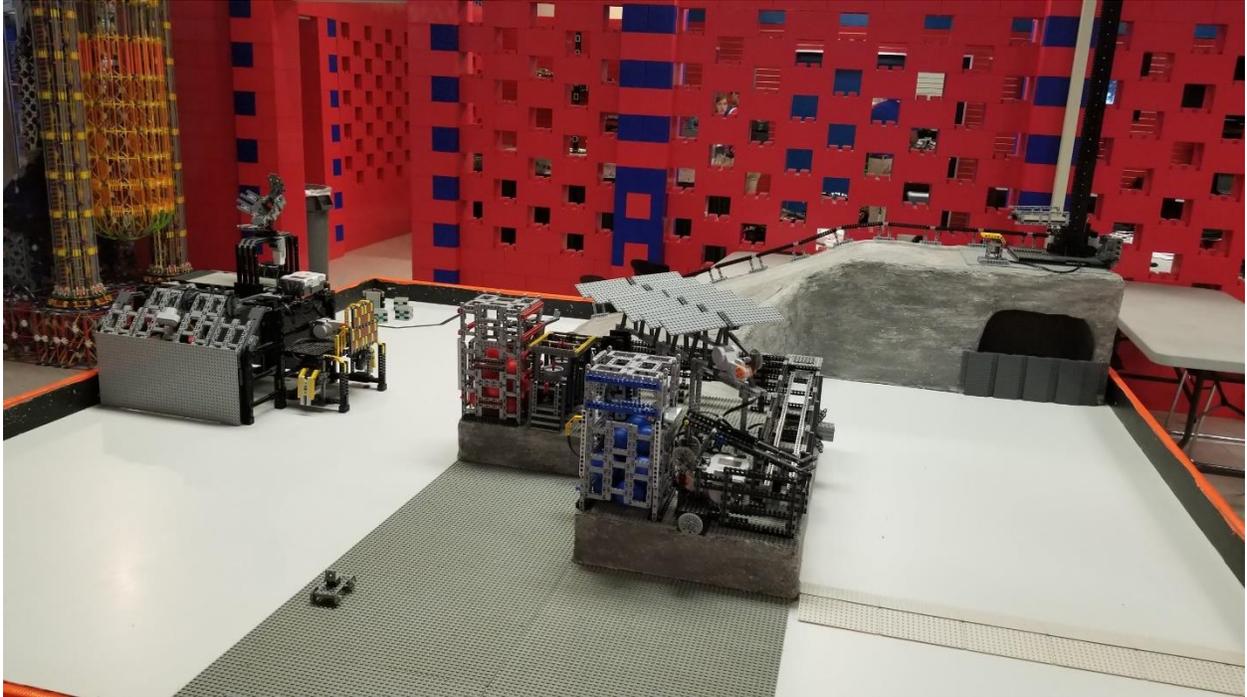
White Paper for our developing program at West Middle School

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Abstract: This paper is a collection of an interview conducted with the leaders of the NASA Space Camp – an expert in the creation and operation of robotics programs targeted for middle school children. This incomplete whitepaper covers the original ideas and brainstorming of the tasks and goals the middle school team will complete. The purpose of the creation of the middle school team is to not only adhere to our mission statement, but to also utilize in our chairman’s award presentation

The world-famous Space Camp, held in Huntsville Alabama, is available to students of all ages and has been the starting point for over four astronauts to this day. Similarly to our desires of West’s team, their goal is to spread STEM knowledge with a specialty in robotics and space travel. They have many programs for different ages, but one in particular caught my interest. Their middle school program is very similar to the proposed ideas we have developed for the West team. They use Lego NXT robots on a plywood field to build prototypes of ideas that students develop throughout the week. This document will be an outline of their program, how they run it, and how we can implement it in a classroom setting.

Students are first divided into small groups. Each group consists of anywhere from 5 to 7 kids. These kids work together for the entire week. On the first day, a video is shown to them. This video has an actor dressed in an astronaut suit that delivers troubling news. He claims that NASA is no longer receiving enough funding to continue research. Therefore, it is up to the kids to research and develop plans for an unmanned lunar vehicle. Their job is to prototype a module using Legos, research the experiments that they would like their vehicle to conduct, and “test their robots on the game table”. Their testing consists of two games. One game is completely autonomous. It is played on a flat field and its job is to track objects and bring them back to a base location in the corner of the playing field. The second game is driver controlled. This game is played on a rough terrain that simulates the lunar surface and has two floors. The top floor is in full view, but the lower floor is completely hidden to the drivers. The robots must integrate sensors and cameras to successfully explore the lower level. The first picture shown is the autonomous table and below it is the teleoperated table.



Students compete in competition on the last day of the camp. These teams take turns on each field playing one at a time. Students are not only encouraged to watch other teams, but cheer as well. It is an enjoyable time for students to show off their creations and the work their team has done over the week. At the end of the camp, the most successful robots are recognized

and given prizes that come from the NASA gift shop. Their awards are based solely on robot performance.

This program already resembles the ideas that we have come up with for the West Team. There are more similarities than there are differences. Obviously we have never talked about a teleoperated game and we would like to reward students on more than just robot performance. This being said, I believe that it is a strong start and a good foundation to lead us in the right direction. I think the idea of having two levels is a fabulous idea and a really cool design challenge for the kids. I also think that having the theming as if the kids are looking to be contracted by NASA is a cool theming factor. The one thing that this program does not have is an introduction to the non-technical subteams as we were trying to simulate in the design challenge. This could be easily integrated, though.

There is a lot that we can learn from this acclaimed program. Not only are there aspects that we can integrate, but this program is a reinforcement that we are going in the right direction! In a discussion that I had with the program director of the space camp and one of the head councilors – a FIRST alumni - I shared some of the ideas that we were coming up with for the West team. They praised our ideas and complimented us on our ambition. If we can successfully organize this event, it could result in a very strong feeder program that is comparable to one that students pay hundreds of dollars to attend year after year. We need to push this as hard as we can and treat this with as much severity as possible. We have NASA rooting for us!