Robotics Camp
National Education Standards
By Lesson
2018

Build Sessions
In this activity, trainees learn the history of Lego, followed by basic building and engineering techniques. The trainees will receive an introduction to the names and uses of various Lego pieces as well as how to create structural stability and basic chassis designs.

Competition
Trainees must demonstrate an understanding of material covered in previous presentations (*Engineering, Programming,* and *Wireless Control*). The activities will allow them to test out the different areas of robotics that they may apply during the week. Trainees will receive bolts for performance and participation in these activities. Bolts earned are dependent on the complexity and difficulty of the challenges.

Electronics Project
As the week progresses, trainees will be given three (3) one-hour sessions to learn about basic circuitry and electronic components. The final two (2) of these sessions will be spent making their electronics project. After completion of the project, the trainees will be able to take it home at the end of the week.

G.E.E.K.
This is a Jeopardy-style quiz game in which teams compete against each other to test the knowledge that they have gained throughout the week. Regardless of the winner, each competing team will add the bolts earned at the end of the game to their totals.

History of Robotics
This history lesson introduces trainees to the origins of the field of robotics, with an emphasis on its breadth and variety.

History of Robots
This history lesson presents trainees with various things to which they must decide whether or not to apply the label "robot".

Numbers and Logic
Trainees learn the basics of the binary number system and its application to Boolean logic and logic gates. The crew trainer will explain how number systems operate using different bases, discuss Boolean logic and how logic gates can turn binary inputs into different binary outputs, and challenge trainees to design logic circuits to perform complex functions.

Programming
The programming lesson teaches trainees basic programming using the latest Lego MINDSTORMS programming software. They will use a visual programming language and will be taught how to use each type of command in the program.

The Trials
The trials are a series of four mini-activities during which trainees must demonstrate an understanding of material covered in previous presentations (*Engineering, Programming,* and *Wireless Control*). The activities will allow them to test out the different areas of robotics that they may apply during the week. Trainees will receive bolts for performance and participation in these activities. Bolts earned are dependent on the complexity and difficulty of the challenges.

UAS
The overall goal of these activities is to learn the basics of flight dynamics and piloting techniques through the use of aerial robots. These robots and acquired skills will be used to complete a scenario-driven challenge.

Wireless Control
Trainees are introduced to the science of electromagnetic waves, their transmission and reception, and their use in controlling robots. The lab counselor will give a brief presentation on electromagnetic waves and radio communication, followed by an introduction to our RoCon software. This is the Robotics software used to remotely control Lego robots. After seeing how the program works, trainees will be given time to practice using it.