



# FACT SHEET

# UNITED STATES AIR FORCE

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## AFRL La Luz Academy Robot Systems Flight



AFRL La Luz Academy's Robot Systems Flight, for eighth graders, is a school-based initiative in which students explore the basics of systems engineering and robotics by learning to assemble and program small wheeled robots called Boe-Bots<sup>®</sup> to run a series of increasingly challenging obstacle courses. At a teacher training session held in August, teachers learn the basics of assembling and programming the Boe-Bots<sup>®</sup> and then return to their classrooms with materials to teach their students these concepts over the course of the fall semester. Scientists and engineers from AFRL attend the training and then provide assistance to the teachers and students as they work on the robots at their school sites.

Students learn about *systems*, explore the *history of computers*, and learn how to think like a computer using *binary math*. They then use a version of the *Beginner's All-Purpose Symbolic Instruction Code (BASIC)* programming language to program the microcontroller that will control their robot. Teams assemble their own Boe-Bot<sup>®</sup> robots by assembling components such as: a *stamp board*, a *chassis*, *servo motors*, *wheels*, a *battery pack*, and various screws, nuts, and washers.

After building their robots, students use their new programming skills to make the robot do some simple tasks—like flash lights, play music, and move forward or backward—at their command. Finally, students program their Boe-Bot<sup>®</sup> to maneuver through a series of increasingly challenging obstacle courses.

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Along the way, via an internet social media web page we set up, students receive monthly robotics and programming challenges from AFRL La Luz Academy. Students who successfully meet the challenges and post videos of their results on our social media web page earn points towards an invitation to participate in the Robot Systems Expo.

The Robot Systems Expo is held in early December at our facility on Kirtland Air Force Base. At the Expo, student teams demonstrate how their Boe-Bot<sup>®</sup> can run through the various obstacle courses. Volunteers from the Air Force Research Laboratory and other organizations interact with and provide feedback to the students as their robots complete each obstacle course run.

For more information, contact AFRL La Luz Academy at (505) 846-8042  
or go to: [www.vs.afrl.af.mil/LaLuz](http://www.vs.afrl.af.mil/LaLuz).

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