

Robert Lane  
NASA Mars Robotics Workshop Reflection

Due to the lack of time in the school schedule, the Lego Mindstoms robotics is being integrated into the curriculum during a robotics club I have created and facilitate before and after school. Students come approximately once a week for 45 minutes to an hour. I have students who have been identified as gifted, on an IEP and from the general education program. The district did purchase one kit to start the year and has agreed to purchase another kit due to the number of students interested and participating in the club. A table has not been built to complete the missions. I taped off a place on the floor in my classroom using the dimensions provided on the directions for build the Mars surface.

The lesson planning has been an exciting process. The NASA Robotics Workshop helped generate ideas by including six Mars missions to work through. I used these ideas and plans as a starting point for my planning and preparation. I had to take into consideration my time restraints. I found that as I planned and worked with the kids, more ideas came to mind and it was easier to plan for specific outcomes or learning opportunities.

I started with the building of the Robot for my first lesson. I felt students needed to see and touch the robot on the first day. The students' natural curiosity allowed for great discussions that can support your lesson. For example, the students wanted "Mo", the robot, to do something once he was built. This led into the point I planned to make which was that He can't do anything until we program him.

The second session allowed for the first Mars mission. Students picked up quickly on the programming using the Mindstorms NXT software that came with my kit. They made the robot move forward and backwards. While some students chose to program, others chose build the plow to clear the area of Mars rocks. Students worked well together. The discussions of how to build the plow were great to listen to as students speculated on how wide and tall it should be

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built. This lesson took two sessions, but allowed students to work in teams to build the best plow. We had a competition to see how quick each team could clear the field. The winner wasn't either of the teams but an individual who decided to make a simple plow while waiting for the others to get finished.

The second lesson taught the use of the light sensor. I specifically planned to spend extra time highlighting the integration of the math with the science. It was worth the time to explain how important the math skills are to the mission. I allowed students to follow along with the video in attaching the sensor to the robot. I let the students put the sensor on too close to the ground. When the sensor didn't seem to pick up much light even when using a flashlight, we brainstormed why it wouldn't work correctly. I had to prompt students and give hints, but eventually they arrived at the conclusion that the sensor needed to be moved slightly away from the floor.

I also had to demonstrate how to make the robot store the data collected from the sensor. Since we used the Mindstorms software, we had to program a little different. We had to tell it how many pieces of data to collect in a second and how long to let it run. We then took the data collected and used the graph to complete the Mission 2 Astronaut Journal.

The journal took some time, but I wanted students to understand that robotics isn't always about the building and programming. Sometimes we need to analyze data to ensure our robot is doing what we need it to do.

After successfully teaching the first two lessons, I feel the students learned the lessons intended. What I also found is the students transferred the experience from the first mission to the second, which shows that they can apply the knowledge to different situations. This will allow for students to better solve problems during the future missions.