Mentoring Team #3958

11/01/19-Building Mission Models

All of the older kids pitched-in to build the mission models. In these photos, Luke built the tan stacks. The team used this mission in their final efforts. Ethan build the bridge, which the team also did. Kenny built the red stack, which the team also used. Andrew built several structures, such as traffic, which the team plan to use but later scrapped.

11/02/19-Core Values Help

Luke and Ethan ran several activities for the team to help them understand the importance of non-verbal communication, listening to each other and being resilient. The girls are showing how they could sort themselves by birthday using their fingers to show their month of birth. This turned out to be idea because the girls won the Core Values Award!

11/27/19 Help with Scratch

The team chose a Scratch project where a character learned about the water cycle through a game. Luke helped Cailin understand how to program in scratch and move from scene to scene.

Luke also helped the team with their PID line follower. The team learned a zig-zag line follower, which was pretty straight forward and easy to understand. However, the team set-out to make an easier to understand line follower which would map the zig zag approach to a proportion.

To make things simple, the team decided to split a total motor power of 24 across two motors. This meant that when the robot was on the edge of the line, each motor would have a power of 12. When the maximum reflected light was detected, the C motor would be 24 and the B motor 0. The reverse would be true when the reflected light was close to 0.

Since their robot turned toward the line from the right, their C motor received more power when the reflected light showed greater intensity. This was easy for the team to understand as they made a ratio of the maximum light intensity and the maximum motor power, which was 24. They used this ratio in a math block to calculate the motor power for all levels of reflected light, such that the motor was effectively off at very low levels and full power (24) at high levels and at mid-power when the light sensors was on the edge of the line being following.

The team had more problems on the left side, however, because the values were negative. Luke observed this and told them they could calculate the C motor first, and then subtract that value from 24 to find the B motor. He showed them how to use a math block to do this and they had a beautiful new algorithm for PID line following.