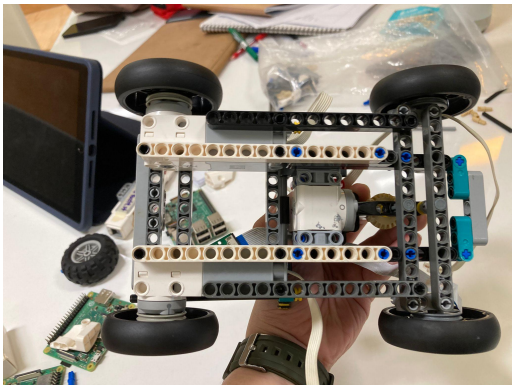
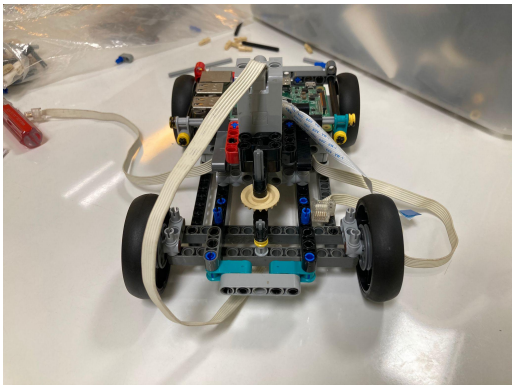
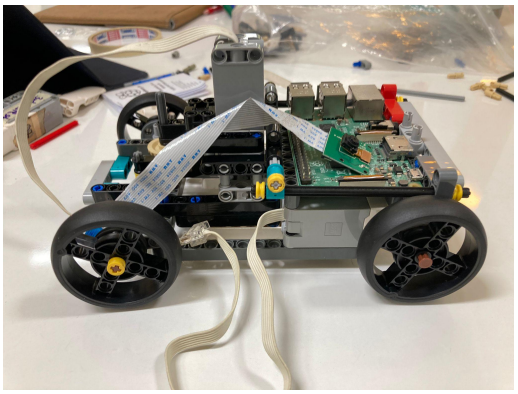
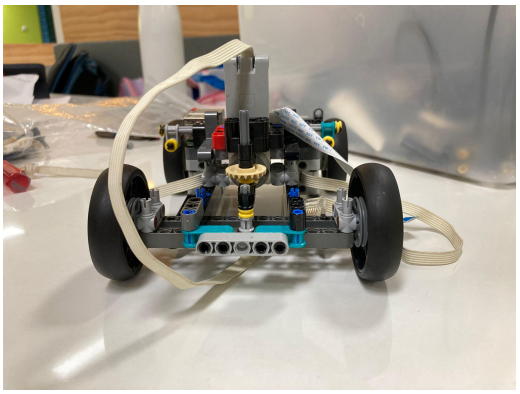
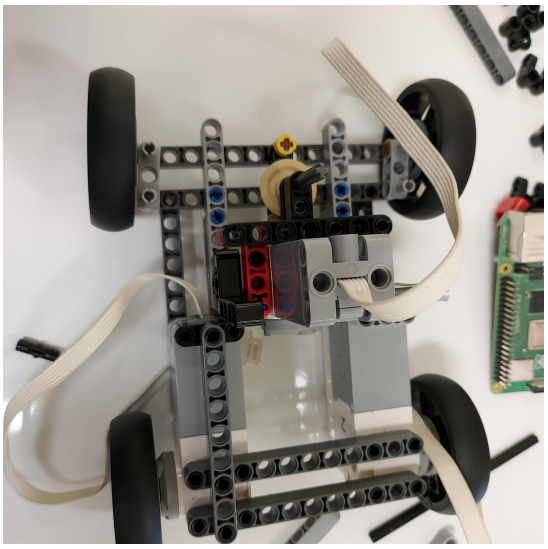
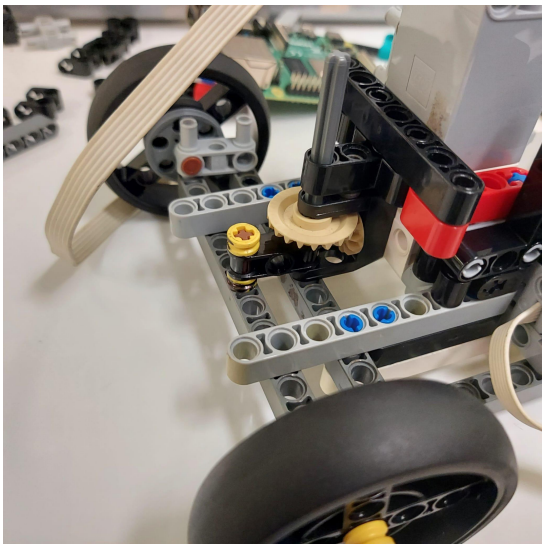
18 May 2023:
2nd Design:

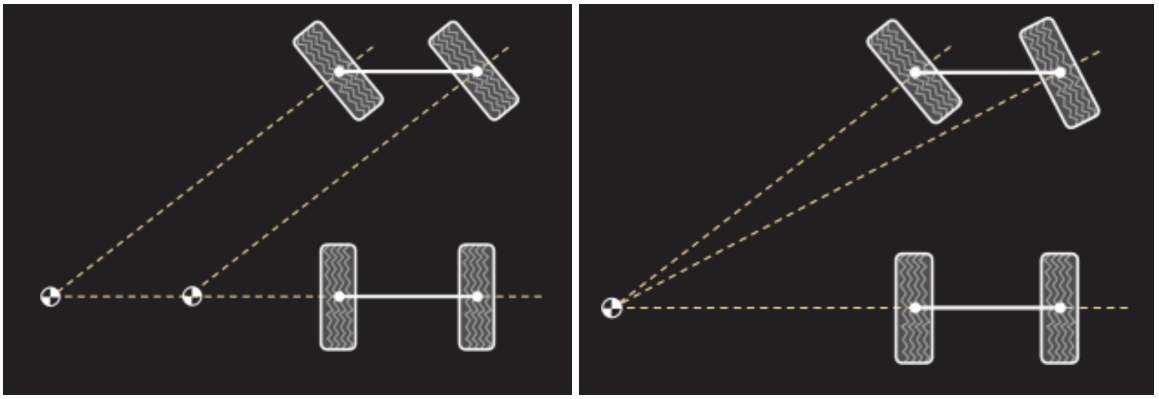





The wheelbase of the robot is much smaller, allowing the robot to make sharper turns. The robot is also now within the size limit. We reduced the length of the robot by removing the ev3 brick between the motors controlling the back wheels and the motor controlling the front wheels. The ev3 brick was replaced by Raspberry Pi Model 4B, which would be placed on top of the motors to reduce the length of the robot. The longer large motors controlling the back wheels were also replaced by shorter medium motors. The motor controlling the front wheels was also placed vertically.

Eventually, we shortened the length between the front wheels and the motor controlling the front wheels. However, the 2 front wheels were still parallel.

Ackermann steering:



pictures from: http://datagenetics.com/blog/december12016/index.html

The picture on the left shows the steering mechanism with the 2 front wheels parallel to each other. This was the original steering mechanism used in our robot. However, this was changed as the wheel(s) would slip due to the incorrect angle. Furthermore, when both wheels are turned at the same angle, the centre of rotation for each of the wheels would be different.
Hence, we used ackermann steering, which is shown in the picture on the right. Each of the front wheels would be turned at a different angle, with the inner wheel having a larger angle. The centre of rotation of the wheels would be at the same point. This would prevent the wheels from slipping.