

Engineering Lab

Power Level Investigation

Investigation Summary:

Engineers conduct thorough testing of products in order to fully understand the technology they are working with. To fully understand the VEX system, you should test the various components. In this investigation, you will learn about the relationship between the motors, the way that ROBOTC handles power levels, and their combined impact on robot performance and control.

Part 1:

In this part of the investigation, you will keep the encoder count as your constant as you modify the power levels.

Use power levels of 31, 63, 96, and 127 and measure the amount of time it takes to travel a specific distance. Chart your results in the table below and then develop a graph of the results to see if there is a proportional relationship between the motor's power level and speed of the robot. Conduct multiple trials to ensure that the results that you record are accurate.

To help you get started, below is a sample program you can use. Before beginning the investigation, you may want to decide how far your robot will travel. The sample code below will make the robot turn two wheel rotations.

Sample Code

```

1 #pragma config(Sensor, dgt11, rightEncoder, sensorQuadEncoder)
2 #pragma config(Sensor, dgt13, leftEncoder, sensorQuadEncoder)
3 #pragma config(Motor, port2, rightMotor, tmotorNormal, openLoop, reversed)
4 #pragma config(Motor, port3, leftMotor, tmotorNormal, openLoop)
5 /*!!Code automatically generated by 'ROBOTC' configuration wizard !!*/
6
7 task main()
8 {
9     SensorValue[rightEncoder] = 0;
10    while(SensorValue[rightEncoder] < 720)
11    {
12        motor[rightMotor] = 31;
13        motor[leftMotor] = 31;
14    }
15    motor[rightMotor] = 0;
16    motor[leftMotor] = 0;
17 }

```

Record your data in the table below and then graph the results

Power Level	Elapsed Time (First Trial)	Elapsed Time (Second Trial)	Elapsed Time (Third Trial)	Average Time	Distance Traveled	Calculated Speed
31						
63						
96						
127						

