

## **Technology Education- Mr. Sottile**

### 8<sup>th</sup> Grade assignment

- 1) Final Project **(100 points)** Use *YouTube* as a resource
  - a. Spinning Sign (1 motor, 2 switches, 2 LEDs)
  - b. Toll Booth (1 motor, 2 switches, 2 LEDs, Sensor?)
  - c. Tekrocks Bridge (1 motor, 2 switches, 2 LEDs, Sensor?)
  - d. 4-Wheel Robot (at least 1 motor, 2 switches, 2 LEDs, Sensor?)
  - e. Freight Elevator (1 motor, 2 switches, 2 LEDs, Sensor?)
  - f. Pull toy (at least 1 motor, 2 switches, 2 LEDs, Sensor?)
  - g. Another idea not listed.

Describe the **design process** for your final project.

Please hand write this assignment or use a digital format (Microsoft Word or PowerPoint). You can attach it to my email. [asottile@carmelschools.org](mailto:asottile@carmelschools.org).

- 1) Define the Problem: What is the purpose of your final robot design?
- 2) Generate Concepts: Sketch at least 2 ideas of your final project. Which mechanism did you use in your design? E.g. Crank & slider, simple gear train, chain drive, lead screw, rack & pinion, cam & follower etc. How many motors, switches, LEDs did you use?
- 3) Design the solution: Which of the 2 design ideas did you choose to build and why did you choose this one.
- 4) Build & Test: after the robot is built, program it. What happened the 1<sup>st</sup> few times you ran the program? What modifications did you make to make to improve your robot?
- 5) Evaluate the Solution: How well did your robot perform? Did you have to modify the program or the robot to make it work better? Did you redesign the robot?
- 6) Presentation: You will present this to the class when we return to school.

Get familiar with programming your robot- check out these sites.

Test Bed: RobotC Tutorial 1 - Programming a Motor - Vex Robotics

<https://www.youtube.com/watch?v=aB2EoQmWWcw>

Test bed: RobotC Tutorial 2 - Programming a Bumper - Vex Robotics

<https://www.youtube.com/watch?v=dPWDlxj8jv8>

RobotC Tutorial 3-Programming a Limit Switch-Vex Robotics

<https://www.youtube.com/watch?v=1dtrPXCQzBw>

RobotC Tutorial 5 – Programming a Potentiometer-Vex Robotics

<https://www.youtube.com/watch?v=UBUfTpl18t0>

RobotC Tutorial 6 - Bonus Potentiometer Code- Vex Robotics

<https://www.youtube.com/watch?v=mk0NQqFA0tY>

RobotC Tutorial 7 - Programming a Line Tracker- Vex Robotics

<https://www.youtube.com/watch?v=X4WiAz3Y43A>

Vex Robotics 3.x While Loop

<https://www.youtube.com/watch?v=OWT2Zcz4ZII>

PLTW POE 3.1.4-While Loops that Run Forever

<https://www.youtube.com/watch?v=4g-Pvmp6pmQ>

PLTW POE 3.1.4 - While Loops with Multiple Requirements

<https://www.youtube.com/watch?v=99b79AtbMj0>

3.1.4 Programming While Loops and If-Then statements in Robot-C for VEX

<https://www.youtube.com/watch?v=qn8ZRhQjENA>

RobotC If & Else Statements

<https://www.youtube.com/watch?v=4fq0heDsfQs>

If/Else Loops in RobotC (Repeat)

<https://www.youtube.com/watch?v=ud3vNH1IMbY>

While Loops in RobotC

<https://www.youtube.com/watch?v=SExk1-R9CFw>

RobotC While Loops

<https://www.youtube.com/watch?v=OWT2Zcz4ZII>

Elevator with rope (very good)

<https://www.youtube.com/watch?v=6GeR9fN61B4>