8th Grade – PRE! (Programming, Robotics & Engineering)
## Mr. Harrington

Course Description:
Over the course of one trimester, 8th grade students design and engineer (draft, CAD, 3d print) a vehicle/robot that will incorporate motors, a computer chip and sensors so that they can program to successfully complete a range of tasks.

Course Content
Phase #1: Learn How to Use Computer Aided Design & 3D Printing (Recreate a Model)
1. Students will learn how to use the online CAD program "Tinkercad."
2. Students will apply their new skills in the recreation of a model "Peg,Cube, Sphere."
3. Students will print their "Peg,Cube, Sphere" on a 3d printer.
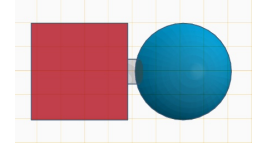
Phase #2: Learn How To Draft / Computer Aided Design / 3D Printing (Recreate a Model)
1. Students will learn how to draft a detailed drawing of a model car.
2. Students will build this model car in a CAD program.
3. Students will print their cars on a 3d printer.
4. Students will race their cars.

Phase #3: Apply Skills: Draft / CAD / 3D Print / Motor / Program (Custom)
1. Students will design their own custom vehicle.
2. Students will manually draft this vehicle.
3. Students will build their personal vehicle with an online Computer Aided Design program.
4. Students will form their custom cars with a 3d printer.
5. Students will add motors and power supplies.
6. Students will add a computer chip and manually drive their computer.

Phase #4: Build Robot: Draft / CAD / 3D Print / Assemble / Add Motors & Chip
1. Students will design their robot chasis.
2. Students will manually draft their robot chasis.
3. Students will build their robot chasis with an online Computer Aided Design program.
4. Students will form their robot chasis with a 3d printer.
5. Students assemble their robot by adding motors and power supplies.
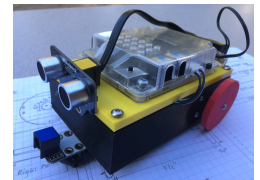
Phase #5: Programming with Sensors.
Students will design and write programs so that their vehicle can compete in a number of activities. Eventually they will add and program sensors to perform more advanced tasks.

Class Conduct
- The moment the bell rings be in your seat.
- Have fun, but please don't be a distraction to others.

Also:
- Bathroom (Bladder Control) – Just ask.
- Roaming the Room – The only students who should be out of their seats are those who are helping others. If you want to help someone, just ask.
- Food & Drink – Nope…can't damage the computers.
- Other Class Assignments – Other class assignments are not to be done during class time.

Availability:
I will always make myself available to assist you…just ask.

Class Materials: Earbuds and Tech Folder.

Grading Policy
The Grading Policy allows all of my students to move at their own speed and get credit for what they have achieved. As they complete certain projects, they get credit and when they complete the next project, their grade is raised to match their accomplishment. There is no subjectivity to this grading system and it's very clear to the student what they need to achieve to attain certain grades. The assignments build in complexity, so students must complete the "C-" assignment before moving on to the "C" assignment, etc.

Grading Scale
C-: Peg, Cube and Spere.
C: Draft & Print "Fastest Car."
C+: Draft & Print "Cool Car."
B-: Draft, Print and Assemble Robot with motors, computer chip sensors and power supply.
B: Program Robot Motion.
B+: Program Robot Line Sensor.
A-: Program Robot Ultrasonic Sensor & Light Sensor.
A: Carpet City