PLTW Engineering Competency Profile

The Student Can:

- Sketch objects including dimensioning
- Create multi-view drawings using CAD solid modeling software
- Scale and properly dimension simple drawings
- Create isometric drawings
- Create basic electrical and fluid power schematics
- Create simple CNC language from CAM software
- Calculate basic gear train speed and torque data
- Interpret basic BOM information
- Determine the mechanical efficiency of simple and complex mechanical devices
- Create process flow charts for manufacturing a given product
- Use precision measuring tools, calipers, scales, and tape measures
- Convert between metric and US customary measurement systems
- Calculate mean and average of sample data, construct a histogram
- Create and edit simple programs for bench top robots using a teach pendant as well as PC software
- Used simulation software to create and test basic electronic circuits
- Use a digital multimeter to measure voltage, current and resistance values
- Create and analyze free body diagrams for two-dimensional statics
- Calculate mass properties of various objects using both manual estimation and software packages given physical dimensions and material make-up of the object

The Student Has:

- Used a design process to manage lab projects
- Operated bench model CNC equipment
- Demonstrated understanding of basic safety practices in an industrial environment
- Demonstrated proper use of basic shop hand tools including: files, hammers, and wrenches
- Demonstrated proper set up and operation of hydraulic and pneumatic fluid power systems
- Demonstrated proper set up and operation of basic DC circuits
- Used a solid modeling software to create a part and subsequently produced a part on a rapid prototype machine
- Worked on project teams to solve problems and generate a practical solution
- Soldered electronic components on circuit boards
- Designed digital circuits to given specifications
- Used solderless breadboards to test digital and analog circuits

- Set up communications between a CNC machine and a robot to load and unload the CNC machine
- Observed a stress analyzer pull tensile specimens and record data for the same
- Used online and published works to research patented items when developing design ideas
- Developed a prototype alternative energy system given the constraints as well as available materials for project completion
- Used a decision matrix approach to determine the best possible solution for problem resolution
- Created a career passport of personal qualifications and achievements
- Earned OSHA 10 General Industry Certification