Autonomous Vehicle or Machine/Product Project

Group of 1 or 2

Goal: Design (may use Onshape and/or Creo), 3D Print, and Program an autonomous vehicle or machine/product. Vehicle or Machine/Product maybe wheeled, walking, or stationary.

Vehicle or Machine/Product Requirements must include

1. Start Button to executes code that operates the vehicle/product autonomously
2. Min. 2 Servo or DC Motors
3. Min. 2 Sensors
    a Ultrasonic Sensor: To sense what is in front of the vehicle. (NOTE: May add sensors to the right and left flank of the vehicle)
    b IR Sensor
    c Gas Sensor
    d Photo Resistor
    e Soil
    f Humidity
    g Etc.
4. 1-2 Arduino Board w/Shield
5. Power
    a Cell Phone Battery Pack
    b Relays to supply extra electricity
    c Batteries (9 Volt, etc.)
6. LED's lights for Signal to operator (I.E Green machine is on; Red is off or Red Tail lights for a car)

Vehicle or Machine/Product will Include one of the following (May include multiple)

1. LCD Computer screen
2. Speaker
3. Robotic arm (Pre-Built)
4. Manual Mode using a PS3 Controller
5. Other devices maybe submitted for approval

Vehicle or Machine/Product Construction will include

1. Body Panels: I.E Removable top, roll bar, etc. to protect and allow access to electrics
2. Slots/Brackets for securely hold the Arduino, Ultrasonic Sensor, battery pack, wires etc. in place
3. LED Lights for signal, headlights, brake lights, etc.

NOTE: Vehicle or Machine/Product may incorporate other features other than what is listed. See teacher for discussion on implementation of various sensors, electrical devices, power sources, motors, etc.

Submission Portfolio

Directions: Create a portfolio of the entire scope of the project. Organize materials in a 3 hole folder

1. Folder Front
    a. Title of Project
    b. Author Name
    c. School Name
    d. Color Photo of Project
2. Table of Contents
3. Minimum 1 Page paper describing the project
    a. What is the project
    b. Inspiration for project
    c. How the project Operates
        i. ID devices that provide feedback
            1. Sensors
            2. Speakers (noise)
            3. LED's (Sight)
            4. Etc.
    d. Color Photo(s) of Project
        i. Show overall Assembly
        ii. Show internal Location of Electrical Components (Arduino, Power Source, Sensors, etc.), Body structure to hold objects into place, Drive Mechanisms, etc.
4. Cover Page of Project
    a. Description of Project
    b. Part's List
    c. View(s) showing overall scope of project
        i. Overall dimensions
        ii. Part Connections
        iii. Electrical Component Locations
5. Electrical Schematic- Ladder Wiring Diagram using Autocad Electrical
6. Printout of Code
    a. Code will have comments identifying major parts of the codes
7. Film the Product Operating