

Planning

Timeline: Production Plan

Step	Process	Tools/equip/materials	Safety	Time
	Circuit Creation			
1	Gather electrical components and laser cut base	Plastic base, Arduino Uno, Ultrasonic Sensor, RGB Sensor, L298N, DC Motor x2, Printed Circuit Board (PCB), Secondary Power Supply, Button x3, RGB LED, Buzzer, Resistors		
2	Place main electrical components in their corresponding slot	Arduino Uno, Ultrasonic Sensor, RGB Sensor, L298N, DC Motor x2, Printed Circuit Board (PCB), Secondary Power Supply, AA Battery Pack	Do not force components	20 mins
3	Lock in electrical components with screws	3D Printed (non-threaded) Screws or metal (threaded) screws		
4	Connect main components together with jumper wires and printed circuit board (PCB) as the central hub	Jumper wires, Main Electrical Components, Printed Circuit Board (PCB)	Make sure wires are not tangled	20 mins
5	Connect secondary components to main components with jumper wires	Jumper wires, Button x3, RGB LED, Buzzer, Resistors		
6	Plug Arduino Uno into computer and install test script	USB 2.0 Printer Cable, Arduino System, Computer, Arduino IDE Script		10 mins
7	Run Cicuito.io test script	Arduino system		
8	Solder all wires to their respective slot in the Printed Circuit Board (PCB)	Printed Circuit Board (PCB), Electrical Components, Jumper Wires, Soldering Iron, Solder Wire, Sponge	Safety glasses	30 mins
9	Run Cicuito.io test script	Arduino system		

10	Locate and fix any errors if script does not run	Multimeter, Soldering Iron, Solder Wire, Sponge	Safety glasses	10 – 20 mins
11	Plug Arduino Uno into computer and install runtime script	USB 2.0 Printer Cable, Arduino System, Computer, Arduino IDE Script		
Exterior Installation				
1	Gather mechanical (exterior) components and casing	Pivot Wheel, 3D Printed Casing, 3D Printed Door, Large Wheel x2		
2	Attach wheels to DC motors	Large Wheel x2	Do not force components.	15 mins
3	Attach pivot wheel to front of base (underside)	Pivot Wheel, 3D Printed (non-threaded) Screws or metal (threaded) screws		
4	Combine 3D printed parts. Slide door inside case railing	3D Printed Casing, 3D Printed Door		
5	Slide 3D printed case over the Arduino system base	3D Printed Casing, Laser cut base with Arduino System		
6	Attach electrical components to casing	3D Printed Casing, Ultrasonic Sensor, Button x3, RGB LED		10 mins
Total Time				2 Hours

Third Party Materials, Components and Processes

Category	Third party Material	Description	Owner	Link (if applicable)
Software				
	Arduino IDE	The compiling software which is needed to program the Arduino Uno	Arduino	https://www.arduino.cc/en/software
	Generated Arduino IDE Script	An Arduino Uno script generated by Circuito.io (a circuit creation software) which assigns all correct ports and has test code to	Circuito.io	https://www.circuito.io/ https://www.circuito.io/

		examine the status of each component		
	Fusion 360	The software used to create the non-electronic components of the project (laser cut base and 3D printed shell)	Autodesk	https://www.autodesk.com.au/products/fusion-360 https://www.autodesk.com.au/products/fusion-360
3D Models				
	Arduino Uno	A 3D model of the Arduino Uno with real world dimensions	Andrew Whitham	https://grabcad.com/library/arduino-uno-r3-1 https://grabcad.com/library/arduino-uno-r3-1
	Ultrasonic sensor (HC-SR04)	A 3D model of the HC-SR04 with real world dimensions	Dejan	https://thangs.com/designer/HowToMechatronics/3d-model/HC-SR04%20Ultrasonic%20Sensor%203D%20Model-48028
	DC Board (L298N)	A 3D model of the L298N with real world dimensions	Tijani Jouini	https://grabcad.com/library/l298n-17
	DC Motor	A 3D model of the DC Motor with real world dimensions	Moustafa Nabil	https://grabcad.com/library/mini-gear-dc-motor-6-v-yellow-1
	Colour Sensor	A 3D model of the TCS34725 with real world dimensions	Davor Granić	https://grabcad.com/library/tcs34725-rgb-sensor-2
	Rubber Wheel	A 3D model of the Rubber Wheels with real world dimensions	Amine Bouabid	https://grabcad.com/library/dc-motor-with-wheel-1
Machinery				
	3D Printer	The machine responsible for creating the shell.	Aitken College	Not Applicable

	Laser cutter	The machine which is responsible for precisely cutting the plastic base	Aitken College	Not Applicable
Components				
	Arduino Starter Kit	The kit which contains all electrical components to be used in the project	Arduino	Not Applicable