PESto

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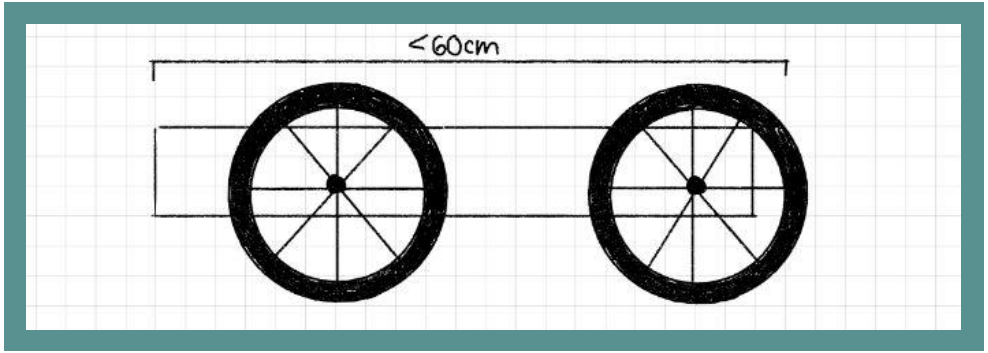
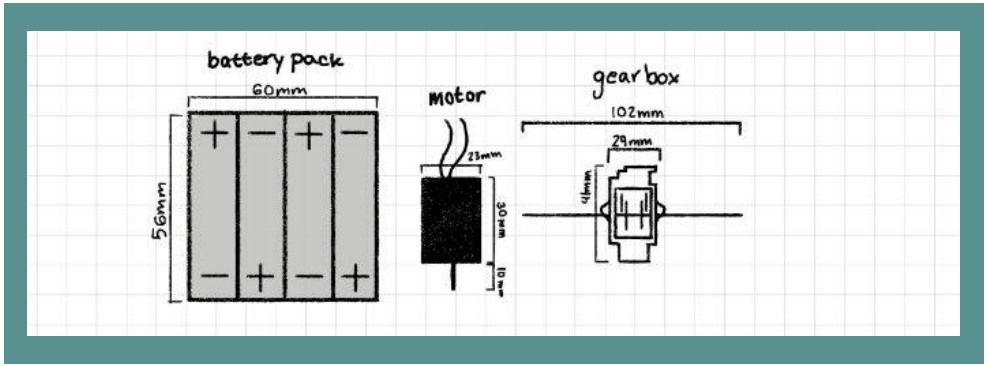
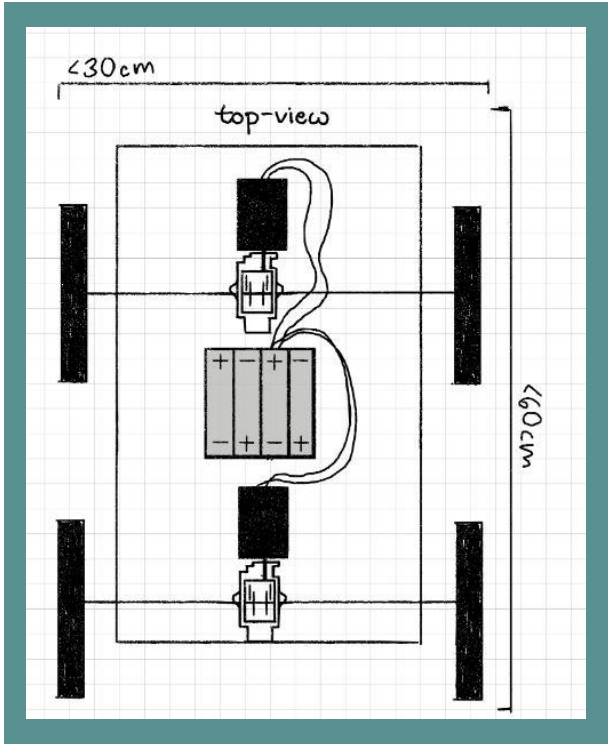
Electric Car Project

Current Design + Sketches







Calculating Top Speed

Given: Let D = wheel diameter, RPM (motor) = motor RPM at the battery pack voltage. We are assuming that nothing is lost in the gearbox/bearings/tires.

Find: Top speed of the car

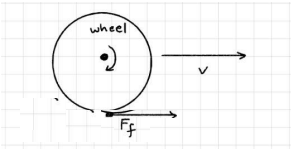
Assumption: Speed = distance/time, ideal system.

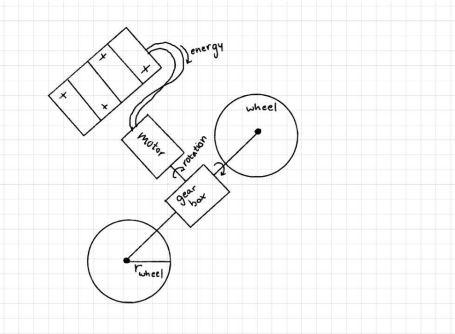
Wheel RPM = Motor RPM (no load)/Gear Ratio = Motor RPM/Gr

Wheel Distance per spin = π * D

Car Speed = (spins per second) * (distance per spin or wheel circumference)

= V = (RPM of the motor/Gr) * ([π*D])



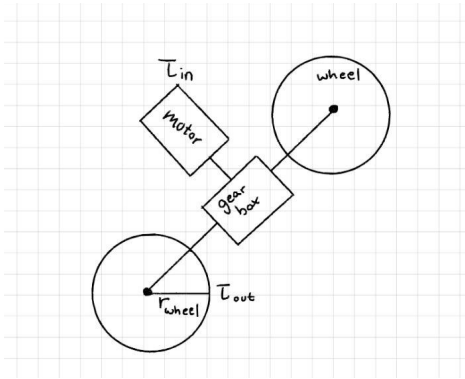


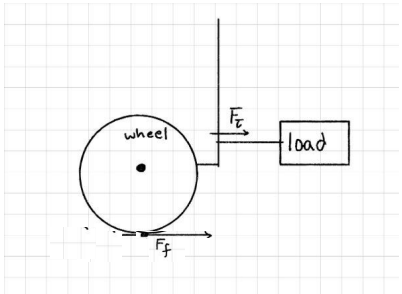
Calculating Pulling Force

Given/Known: Gear ratio (GR), Stalled torque of motor (T_{stall}), Radius of wheel (R_{wheel})

Find: Pulling force of car (F)

Assume: Ideal system, linear and angular velocity constant, no slipping





$T_{in} = T_{stall}$

$T_{out} = T_{wheel}$

$GR = T_{out} / T_{in}$

$GR = T_{wheel} / T_{stall}$

$T_{wheel} = GR * T_{stall}$

$T_{wheel} = F * R_{wheel}$

$F_{pull} = T_{wheel} / R_{wheel}$

$F_{pull} = (GR * T_{stall}) / R_{wheel}$

Schedule

Date	10/28	10/30	11/4	11/6	11/11	11/13	11/18	11/20
Purpose	Presenting	Manufacturing	Manufacturing	Manufacturing	Manufacturing	Testing	Testing	Testing
Location	Uris	Upson	Upson	Upson	Upson	Upson	Upson	Upson
Start	5:00pm	5:00pm	5:00pm	5:00pm	5:00pm	5:00pm	5:00pm	5:00pm
End	6:30pm	6:30pm	6:30pm	6:30pm	6:30pm	6:30pm	6:30pm	6:30pm

Challenges

1) Too Heavy for Motor Torque and Requirements
2) Not Enough Power from the Battery Pack
3) Moves too slow
4) Sourcing Materials and Special/Custom Parts