Design Competition Results
Includes photos shot during the competition and Report Submitted by the Team.

Team 4 (Zixi, Josh, Chris)

1. Data on our car construction and choices

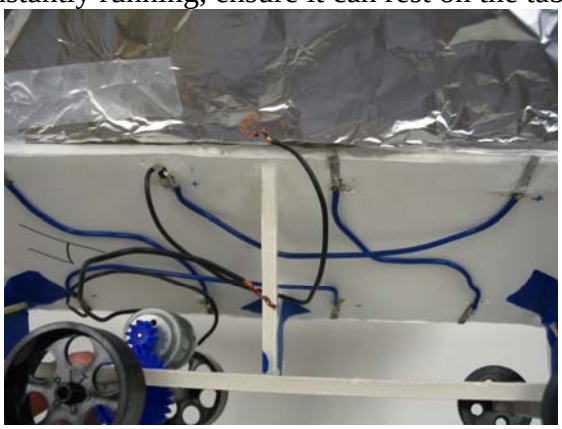
	Motor Components	Gear Size	Number of Teeth	Gear Ratio
1	Motor gear		10	
2	Front wheel gear		32	
	Car Components	**Component Dimension**		
3	Front wheels	Two wide wheels provided by car kit		
4	Rare wheels	Two narrow wheels provided by car kit		
5	Car body foam board	4” x 10”		
6	Axle holder (front and back)	4.5”		
7	Axle (front and back)	5”		
8	Solar cell support panel	4” x 10”		
9	Solar cell connection	2 sets of parallel connected solar cells in series connection, each set contains 2 cells		
10	Solar cell panel angler	~ 40º to the horizontal		
11	Aluminum foils x2	Each is ~6”x 11”		
12	Al foil supporters	Each is 8” long		
	Total Car Weight	**118g**		

2. Several photos and discussion of advantages presented

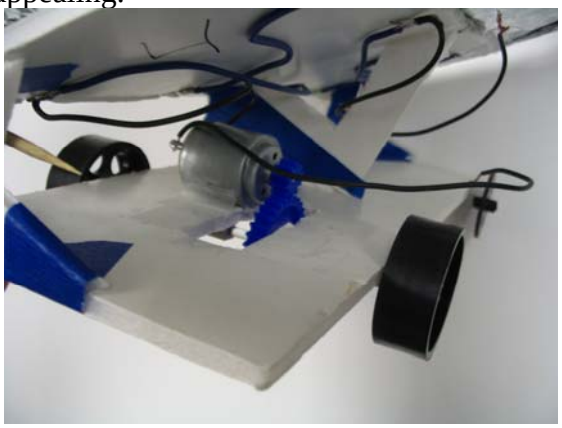


First is the aluminum foil attached on the sides, their purpose was to increase the solar capture result in increasing direct voltage. However, it turned out to be a disadvantage in windy weather.

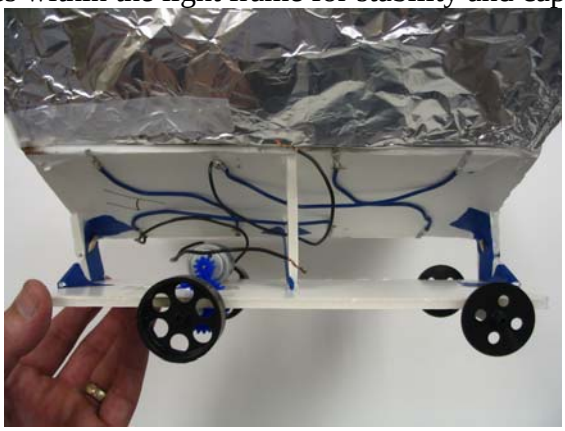
The Second distinguish figure is the “switch” we design for the car, so that the wheels does not have to be constantly running, ensure it can rest on the table easily.



The third smart design is the “slot” that cut out for the gear system which maximizes the space and has a better appealing.



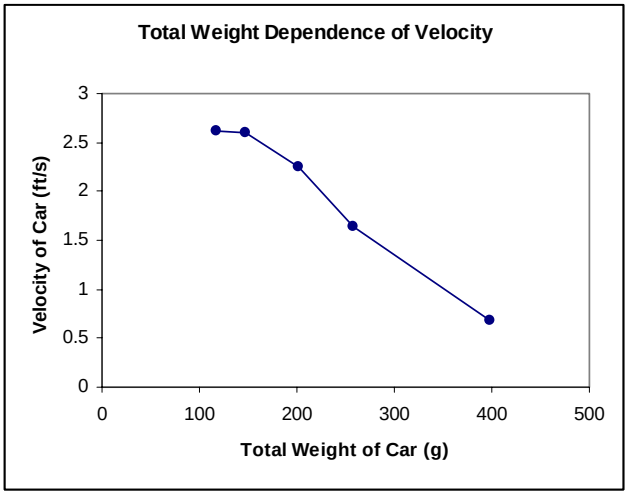
The forth advantage lies within the light frame for stability and capacity of weight carry.



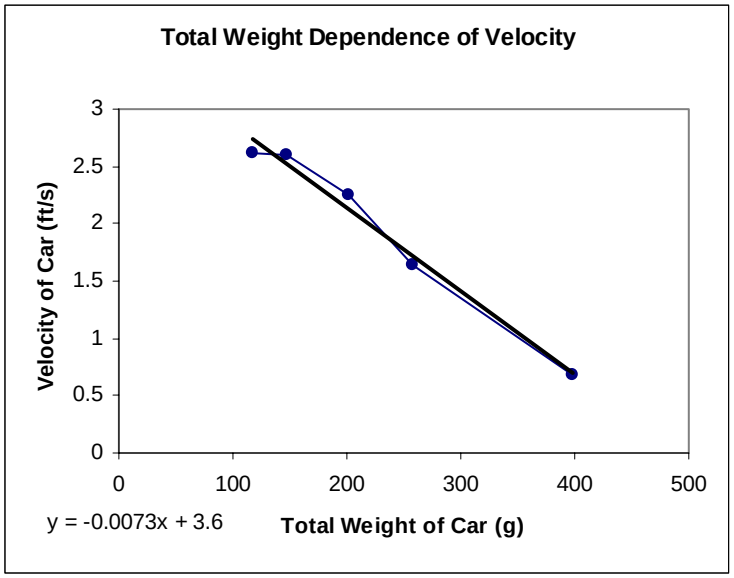
3. Table on the performance of your car for different weights

Time (s)	Weight (g)	Add-on Weight (g)	Dist (ft)	speed (ft/s)
4.91	118	0	12.83333	2.6137
7.31	148	30	19	2.5991
9.5	202	84	21.3333	2.2456
9.87	258	140	16.25	1.6464
19.5	398	280	13.25	0.6794

4. Analysis of the data presented in (3). What is trend? What is meaning?



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As the weight of the car increases, the speed of the car decreases as indicated by the graph above. The graph looks kind of linear, which indicates that there is a linear relationship between velocity and the weight of car. The best linear fit line generates a linear model of y=-0.0073x + 3.6.

The V-I data we collected from the initial testing indicates that the current solar cell circuit arrangement generates the highest power value. Since the competition is based on the equation F=m*D/t where F, m, D, and t represent force, mass, distance and time respectively, a max power output is favorable. Thus, we chose the highest power output configuration generated from our data.