

Question 7, Design Exam

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Musts:	Low Energy Requirement	Produce a Compacted Can
Design Options	Go/No Go	Go/No Go
Option 1	No Go	Go
Option 2	Go	Go
Option 3	Go	Go
Option 4	Go	Go

Critical Objectives	100	Safety
	90	
	80	
	70	
Significant Objectives	60	Durability Ease of Use Few Moving Parts Cost
	50	
	40	
	30	
Non-compulsory Objectives	20	Standard Parts
	10	
	0	

Wants:	Safety	Ease of Use	Durability	Parts	Cost	Few Moving Parts	
Designs:							Totals
Option 1:							
Option 2:	6 / 600	9 / 540	9 / 630	7 / 140	5 / 200	6 / 300	2400
Option 3:	2 / 200	9 / 540	7 / 490	9 / 180	7 / 280	8 / 400	2090
Option 4:	9 / 900	9 / 540	9 / 630	9 / 180	5 / 200	8 / 400	2850

First and foremost, option 1 wasn't considered because it does not meet the "low energy" must. This is because, due to kids being weaker than full-grown adults, it is necessary for them to be able to operate this machine. Option 1 is the only option that does not somehow integrate gravity into the design, and, as such, it would be reliant on a very strong spring, which can also be a safety hazard. In terms of ranking, safety is above all critical, as we

do not want kids crushing their digits. Standard parts aren't very important, and, as such, they end up being at the bottom. The other goals are a bit in the middle with some, like durability, being slightly more important. Option 4 is easily the most safe because, unlike option 3, which has a great potential to crush a finger or hand, 4 is operated by hand, limiting the possibility of crushing a hand. Option 2 is slightly safer, but it appears that there is a possibility of getting a foot stuck in the design, which can be dangerous if the spring brings the plate back. In general, aside from safety, all designs are fairly intuitive, but 3 is slightly less durable because of the string component. All use fairly easy-to-get parts, but 2 might be slightly harder to get parts for because of the "two rail system". Although 3 has two rails, it is much easier to get a string than a strong spring, so it redeems itself. The cost of all might be a bit, as obtaining a strong spring, a strong plate, or a strong lever might be difficult. All have fairly few moving parts, but option 4 seems to be a clear winner of the KTDA rating.