



Selection criteria

How to quantitatively evaluate your ideas.

- We want to build a device that will place a can of tomatoes onto the top shelf.
- We have brainstormed and come up with some ideas that could possible work:

Scissor Lift
Telescopic tower
Catapult
Crane
Quad copter
Pneumatic lift
Hamster





University of
South Australia

Choose the best ideas

Of those ideas we like these the best:

- Scissor Lift
- Extension arm
- Catapult



<http://miracleslidingdoors.com.au/sites/default/files/field/image/options.jpg>



Criterion

Items	Examples
Geometry	Size, length, space, space requirement, arrangement, connection
Kinematics	Type of motion, displacement, velocity, time, path of motion
Forces	Load, direction of force, magnitude of force, stiffness
Energy/power	Type of energy (mechanical/electrical/chemical), input, output, efficiency, loss, friction, pressure
Materials	Type of materials, physical and chemical properties of materials
Safety	Operational and environmental safety, direct protection systems
Production	Preferred production method, means of production, quality and tolerance
Quality control	Testing and measuring, special regulations and standards
Assembly	Special regulations, installation
Operation	Quietness, wear, special uses, working environment (e.g. <i>Warman track</i>)
Cost	Maximum manufacturing cost, tooling cost
Schedules	Project completion timeline, commissioning, delivery, (e.g. <i>by Week 13</i>)



Order you criteria

1. Choose what criteria is important to your group, and put them in descending order of importance.
2. Give a value to each criteria that reflects how important they are (1 to 10).

Criteria	x	Scissor Lift	Catapult	Crane
Reliability	10			
Time to build	8			
Available materials	6			
Cost	5			
Risk	2			



Rate your ideas

3. Rate each of the options in each category (1 to 10)

Criteria	x	Scissor Lift	Catapult	Crane
Reliability	10	8	2	8
Time to build	8	2	5	3
Available materials	6	9	9	6
Cost	5	2	8	4
Risk	2	8	1	4

Do the math



4. Multiply through and total

Criteria	x	Scissor Lift		Catapult		Crane	
Reliability	10	8	80	2	20	8	80
Time to build	8	2	16	5	40	3	24
Available materials	6	9	54	9	54	6	36
Cost	5	2	10	8	40	4	20
Risk	2	8	16	1	2	4	8
			176		156		168

The Scissor Lift rates highest!



This is not suppose to be subjective but...

- You will favour what you want to see happen (human nature). Try not to do it.
- This will show you how close your second and third choices are and that your first option might not be the best one.