

Battle Royale Coinsort 2015: Results

Bharti School of Engineering
Laurentian University
Sudbury, Ontario, Canada

Winter 2015

Prototype results

Group	Coins			Performance		Cost		Total Score
	Correct	Incorrect	Unsorted	Accuracy	Score	Total	Score	
1-01	2	4	6	0%	50%	\$5.74	97%	64.0%
1-03	4	2	6	0%	50%			
1-04	1	0	11	0%	50%	\$3.60	98%	64.5%
1-05	5	1	6	0%	50%	\$5.05	97%	64.2%
1-06	3	1	8	0%	50%	\$15.24	89%	61.8%
1-07	11	0	1	83%	92%	\$66.48	50%	79.2%
1-08	1	2	9	0%	50%	\$10.15	93%	63.0%
1-09	4	4	4	0%	50%	\$38.04	72%	56.6%
1-10	6	1	5	0%	50%	\$22.72	84%	60.1%
2-01	11	0	1	83%	92%	\$14.79	90%	91.1%
2-02	0	1	11	0%	50%	\$1.99	100%	64.9%
2-03	12	0	0	100%	100%	\$22.32	84%	95.2%
2-04	2	0	10	0%	50%	\$62.48	53%	50.9%
2-05	7	2	3	17%	58%	\$1.53	100%	70.8%
2-06	4	2	6	0%	50%	\$11.66	92%	62.7%
2-07	3	2	7	0%	50%	\$14.84	90%	61.9%
2-09	4	0	8	0%	50%	\$7.51	95%	63.6%
2-11	0	1	11	0%	50%	\$1.84	100%	64.9%

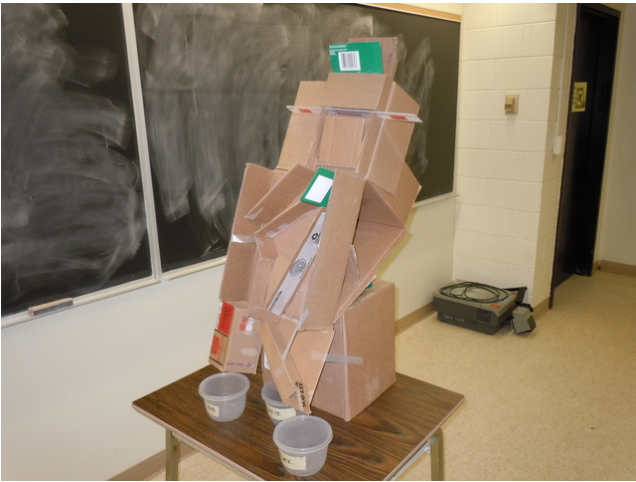
Final results

Group	Coins			Performance		Cost		Total Score
	Correct	Incorrect	Unsorted	Accuracy	Score	Total	Score	
1-01	9	5	1	20%	76%	\$4.62	99%	83.0%
1-02	14	0	1	87%	99%	\$15.08	94%	97.5%
1-03	11	1	3	47%	94%	\$5.38	99%	95.2%
1-04	10	4	1	33%	88%	\$22.79	83%	86.2%
1-05	5	1	9	0%	35%	\$4.85	99%	54.2%
1-06	11	0	4	47%	94%	\$17.00	92%	93.1%
1-07	15	0	0	100%	100%	\$57.80	4%	70.9%
1-08	0	0	15	0%	35%	\$9.41	98%	53.8%
1-09	12	2	1	60%	97%	\$23.08	82%	92.3%
1-10	9	5	1	20%	76%	\$21.18	86%	78.9%
2-01	15	0	0	100%	100%	\$17.01	92%	97.2%
2-02	10	3	2	33%	88%	\$12.45	96%	90.2%
2-03	14	1	0	87%	99%	\$15.98	93%	97.3%
2-04	14	1	0	87%	99%	\$12.37	96%	98.2%
2-05	7	1	7	0%	35%	\$1.01	100%	54.4%
2-06	3	2	10	0%	35%	\$15.15	94%	52.6%
2-07	10	2	3	33%	88%	\$20.33	87%	87.5%
2-08*	13	2	0	73%	98%	\$21.26	85%	84.5%
2-09	10	3	2	33%	88%	\$7.50	98%	90.9%
2-11	13	2	0	73%	98%	\$1.62	99%	98.7%

*Device did not have a static base.

Group 1-01

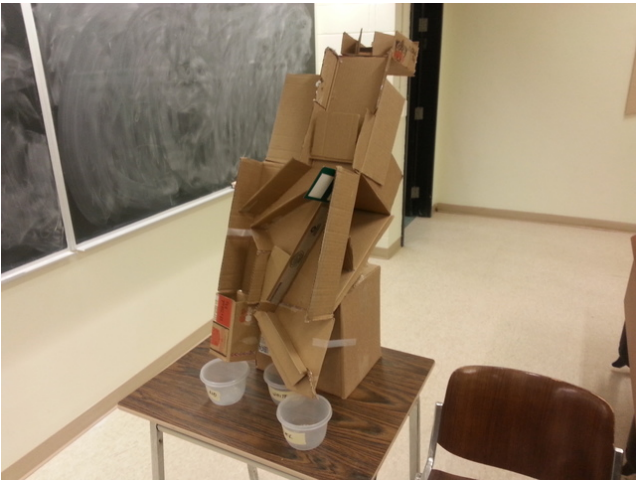
Prototype



Watch video of the device in action: <http://youtu.be/s5iV7S-dxm0?t=0m14s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
Corrugated Boxes, 12" x 12" x 12", 25/Bundle	\$21.50	used as the sorting device	12.5%	\$2.69
Aurora Tools Glue Sticks, Hi-Temperature, 7/16" x 10", Clear, 100/Pack	\$70.00	Used to glue the cardboard	2%	\$1.40
Scotch Magic Tape with Dispenser	\$3.20	Used to support carboard	16.7%	\$0.53
Staples Shatterproof Ruler, 30 cm, Assorted	\$1.12	Used as our beginning mechanism	100%	\$1.12
TOTAL				\$5.74

Final design

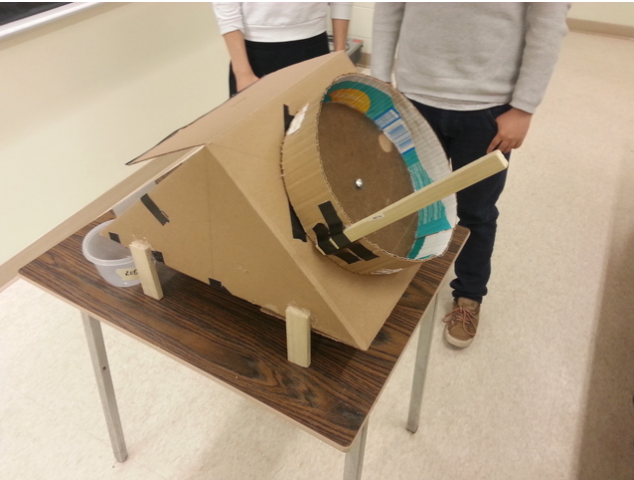


Watch video of the device in action: <https://youtu.be/IbaLWvTS9c?t=16s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
Corrugated Boxes, 12" x 12" x 12", 25/Bundle	\$21.50	used as the sorting device	1/8	\$2.69
Aurora Tools Glue Sticks, Hi-Temperature, 7/16" x 10", Clear, 100/Pack	\$70.00	Used to glue the cardboard	1/50	\$1.40
Scotch Magic Tape with Dispenser	\$3.20	Used to support carboard	1/6	\$0.53
TOTAL				\$4.62

Group 1-02

Final design

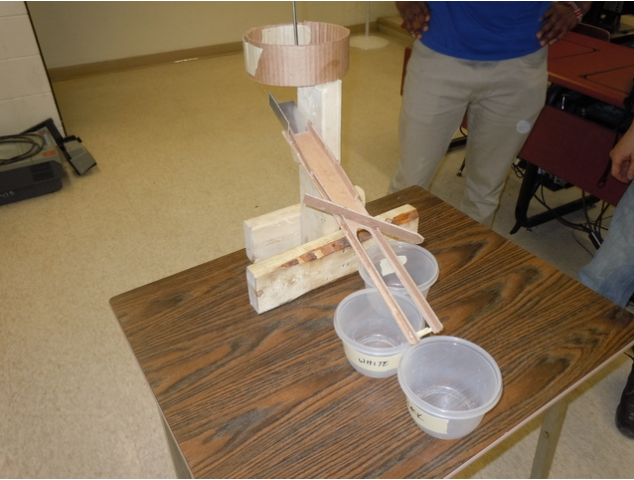


Watch video of the device in action: <https://youtu.be/IbaLWvTS9c?t=23s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
Small Moving Box	\$0.99	design desk	75%	\$0.74
1x2x8 Framing Lumber	\$1.09	desgin frame	100%	\$1.09
Handi-Foil Aluminum Foil, 250-ft	\$4.99	reduce friction	10%	\$0.50
Buildex Stainless Steel Flat Washer, 1/4-in	\$1.99	attach the disk with the device's base	200%	\$3.98
4-ft x 8-ft Lauan Utility Plywood Underlayment Panel	\$15.00	disk's material	20%	\$3.00
Duck Tape Black Duct Tape	\$5.90	to attache the framing lumber	10%	\$0.59
532ml Gorilla Wood Glue	\$6.97	to fix the handle on the disk	10%	\$0.70
Buildex G2 Zinc Carriage Bolt	\$2.49	to fix the disk on the device's base	100%	\$2.49
Buildex Nylon Lock Nut	\$1.99	used tide the bolt on the device	100%	\$1.99
			TOTAL	\$15.08

Group 1-03

Prototype



Watch video of the device in action: <http://youtu.be/s5iV7S-dxm0?t=0m35s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
Multi-Temp Mini 4-in Glue Gun Stick, 30-pc	\$5.99	used 2 sticks	6.67%	\$0.40
2x4x8 SPF Dimension Lumber	\$2.90	enough for 2	50%	\$1.45
Hardboard 1/8 x 4 x 8	\$13.62	used 1/16 of panel	6.25%	\$0.85
10x2 Flat Soc Wood 11Pc Screw	\$2.97	used 6 of 13	46.2%	\$1.37
Corrugated Boxes, 10" x 6" x 6", 25/Bundle	\$12.00	uses half of one box	2%	\$0.24
1/2 x 6 Foundation Bolt W/Nut&Washer	\$1.39	each	100%	\$1.39
			TOTAL	\$5.70

Final design

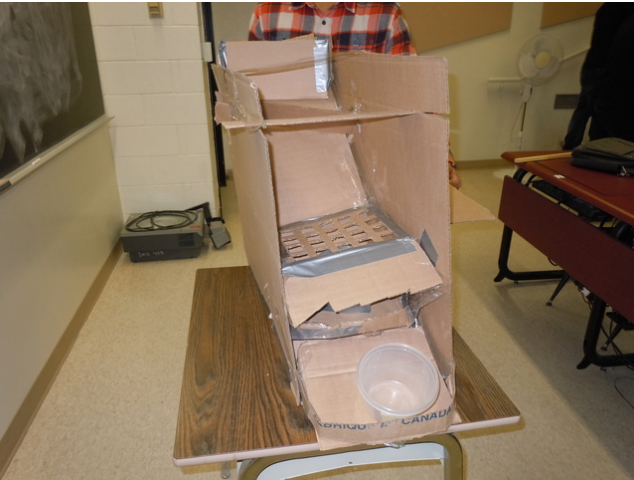


Watch video of the device in action: <https://youtu.be/IbaLWvTS9c?t=33s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
Multi-Temp Mini 4-in Glue Gun Stick, 30-pc	\$5.99	used 2 sticks	6.67%	\$0.40
2x4x8 SPF Dimension Lumber	\$2.90	enough for 2	50%	\$1.45
Hardboard 1/8" x 4' x 8'	\$13.62	used 1/2 square foot	1.5%	\$0.20
10x2 Flat Soc Wood 11Pc Screw	\$2.97	used 6 of 13	50%	\$1.49
Corrugated Boxes, 10" x 6" x 6", 25/Bundle	\$12.00	uses half of one box	2%	\$0.24
1/2 x 6 Foundation Bolt W/Nut&Washer	\$1.39	each	100%	\$1.39
6'X24" Sheet Metal 22G Galvanized	\$6.99	used 2" by 24" piece	3%	\$0.21
			TOTAL	\$5.38

Group 1-04

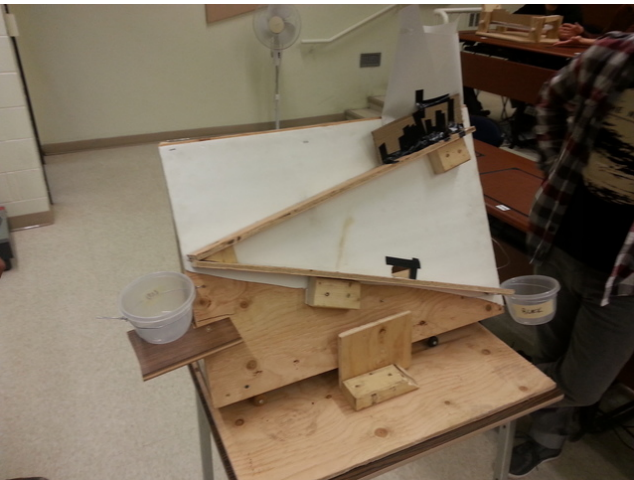
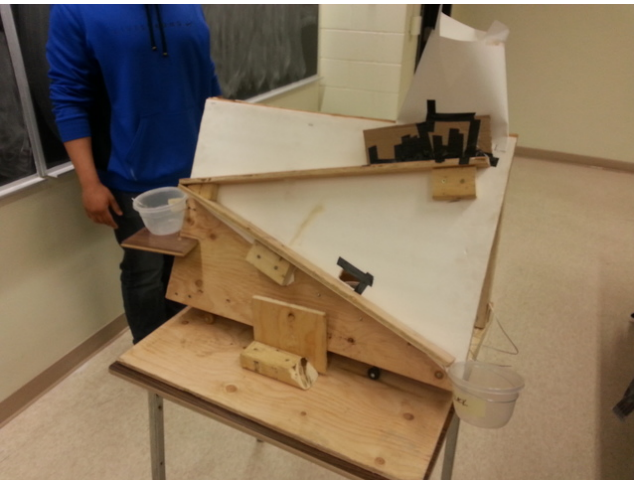
Prototype



Watch video of the device in action: <http://youtu.be/s5iV7S-dxm0?t=0m54s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
Duck Tape Black Duct Tape	\$5.59	3 meters out of 18 meters	5%	\$0.28
Cnrugated Cardboard Pads S-3193	\$40.00	2 pads out of 25	8%	\$3.20
Cantech Box Sealing Tape, Clear, 48 mm x 50 m, 4-pk	\$4.99	0.10 of 1 roll	2.5%	\$0.12
			TOTAL	\$3.60

Final design

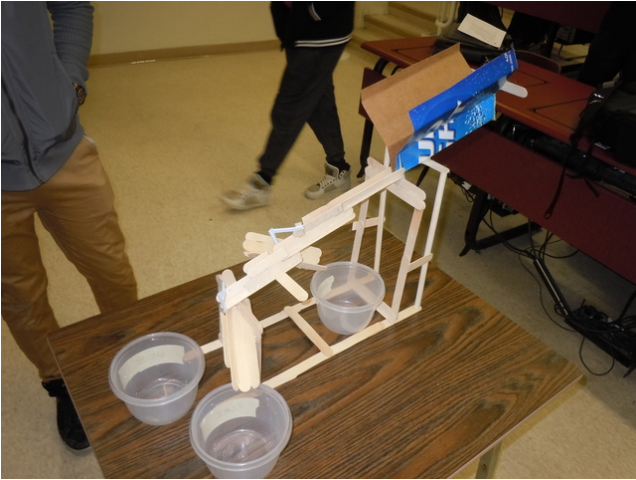
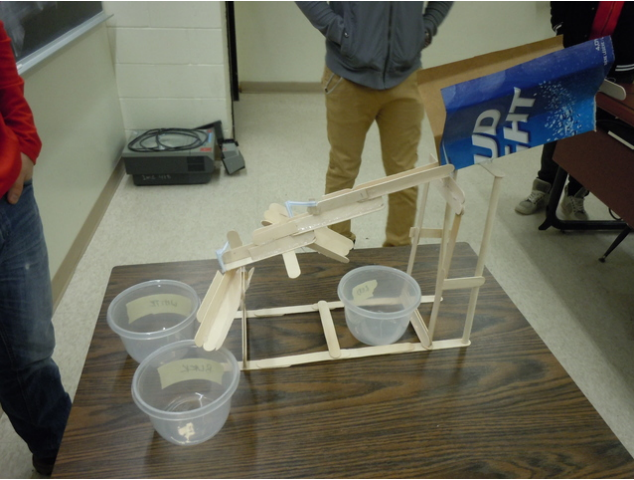


Watch video of the device in action: <https://youtu.be/IbaLWvTS9c?t=41s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
Checker set wood	\$7.95	4 out of 24 for wheels	16.67%	\$1.33
H. Paulin Corner Bracket	\$0.98	4 of them for wheel mounts	400%	\$3.92
1/2 inches 4 ftx8 ft Standard Spruce Plywood	\$23.33	1/2 a sheet	33%	\$7.70
2 x 4 x 8' Treated Wood	\$4.84	2 x 4 x 8' Treated Wood	50%	\$2.42
Elmer's White GUIDELINE Foam Board, 2-pack	\$5.96	1 sheet	50%	\$2.98
KingChain Galvanized Wire, 18g	\$4.19	1/30 meters	3%	\$0.13
Buildex Flat Head Wood Screw, Assorted	\$12.29	20/140	14%	\$1.72
2x6x16 SPF Dimension Lumber	\$12.22	8 inches/ 16 feet	4.69%	\$0.57
Scotch Magic Tape, 3/4-in	\$2.49	20 cm/ 7.6m	2.6%	\$0.06
Staples Poster Board, 22" x 28", White, 10/Pack	\$6.70	1 Board	10%	\$0.67
Arrow T50 1/2" staples - Pack of 1250 staples	\$3.79	10/1250 satple	8%	\$0.03
1/4 in. -20 tpi x 1-1/2 in Hex Bolt (100-Piece per Box)	\$13.77	4/100 bolts	4%	\$0.55
1/4 in. Zinc-Plated Coarse Threaded Hex Nut	\$0.06	4 of them for wheel mounts	400%	\$0.24
40 x 48" 200 lb. Corrugated Pads	\$42.75	1/4 pad out of 25	1%	\$0.43
3M electrical tape	\$2.79	1 foot out of 65 feet	1.5%	\$0.04
			TOTAL	\$22.79

Group 1-05

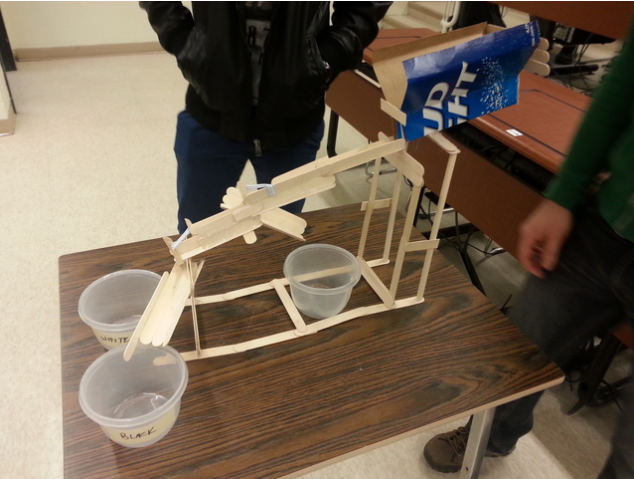
Prototype



Watch video of the device in action: <http://youtu.be/s5iV7S-dxm0?t=1m09s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
Elmer's Jumbo Craft Sticks, 300/pack	\$5.95	could make 6 devices	16.67%	\$0.99
Corrugated Boxes, 20" x 14" x 12", 20/Bundle	\$38.69	can make 120 devices with bundle	0.83%	\$0.32
Stanley Bostitch Glue Gun Sticks, 24/Pack	\$6.59	can make 2 devices	50%	\$3.30
Goodtimes Drinking Straws, 8" 300 pack	\$1.94	300 devices	0.33%	\$0.01
Elmer's Dowel Rods, 16 Pieces	\$3.46	8 devices	12.5%	\$0.43
			TOTAL	\$5.05

Final design

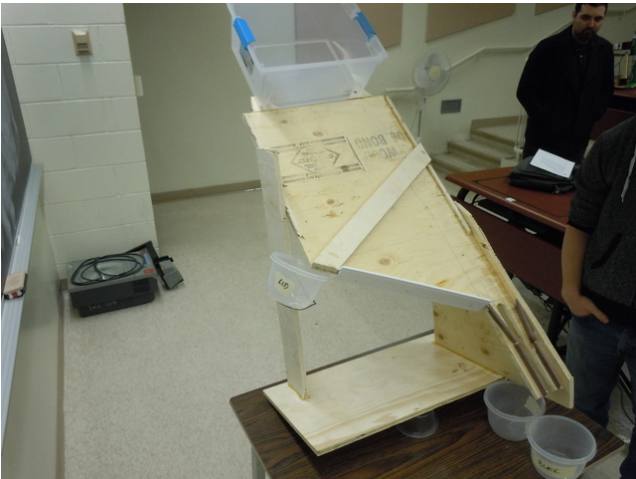


Watch video of the device in action: <https://youtu.be/IbaLWwTS9c?t=48s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
Elmer's Jumbo Craft Sticks, 300/pack	\$5.95	could make 6.25 devices	16%	\$0.95
Corrugated Boxes, 20" x 14" x 12", 20/Bundle	\$38.69	can make 120 devices with bundle	0.83%	\$0.32
Stanley Bostitch Glue Gun Sticks, 24/Pack	\$6.59	can make 2.1 devices	47.62%	\$3.14
Goodtimes Drinking Straws, 8" 300 pack	\$1.94	300 devices	0.33%	\$0.01
Elmer's Dowel Rods, 16 Pieces	\$3.46	8 devices	12.5%	\$0.43
			TOTAL	\$4.85

Group 1-06

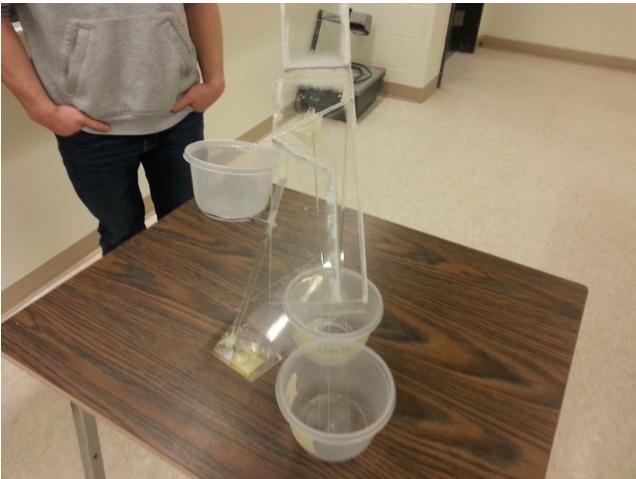
Prototype



Watch video of the device in action: <http://youtu.be/s5iV7S-dxm0?t=1m15s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
3/8 inches 4 ftx8 ft Standard Spruce Plywood	\$18.27	To build walls and base	50%	\$9.14
3.78 L White Glue	\$17.97	To hold wood and parts together	5%	\$0.90
42-Inch Treated Wood Railing Baluster	\$1.17	To make smaller pieces of machine	50%	\$0.59
Sterilite ShowOffs Storage Container	\$4.00	Use as hopper	100%	\$4.00
White Hardwood Colonial Trim Moulding 1/4 x 13/32 - Sold Per 8 Foot Piece	\$4.17	Guide to hold coins in	15%	\$0.63
TOTAL				\$15.24

Final design

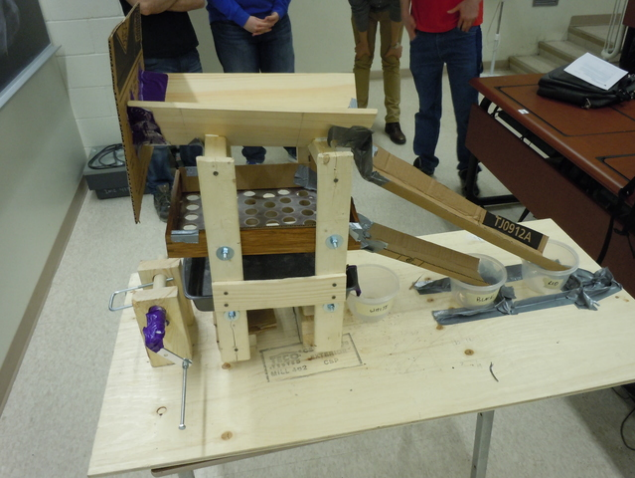
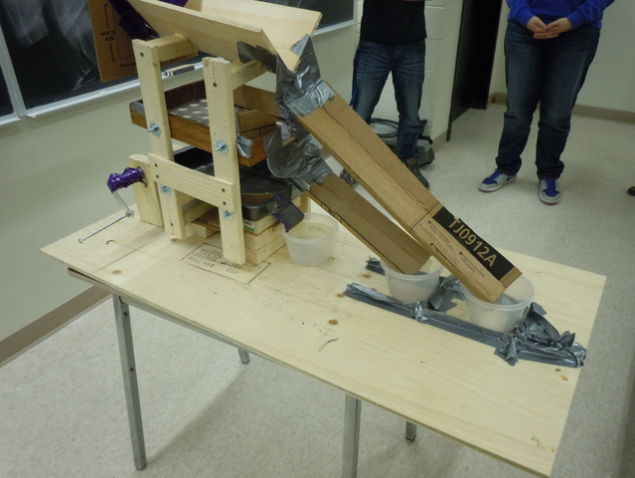


Watch video of the device in action: <https://youtu.be/IbaLWvTS9c?t=54s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
Clear Acrylic Sheet - 080 Inch x 18 Inch x 24 Inch	\$16.79	Could be used to make 2 devices	50%	\$8.40
PermaPoxxy 1 minute epoxy	\$8.49		100%	\$8.49
Wire hanger (18" white shirt)	\$55	Device uses only 1 hanger out of 500	2%	\$0.11
TOTAL				\$17.00

Group 1-07

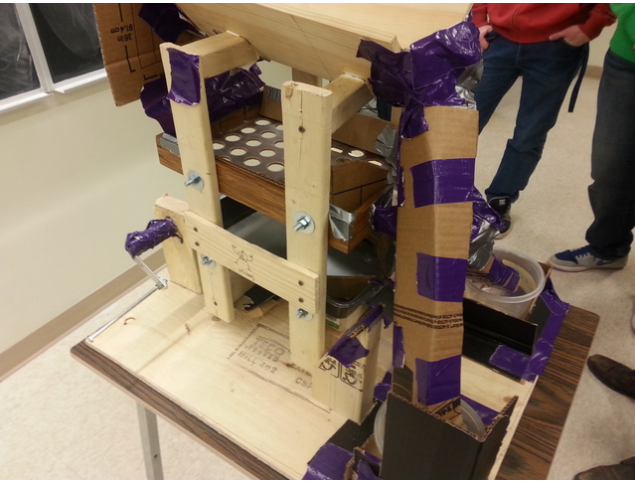
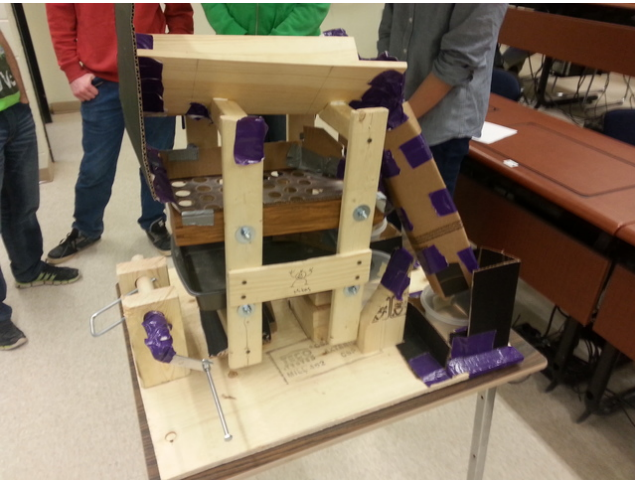
Prototype



Watch video of the device in action: <http://youtu.be/s5iV7S-dxm0?t=1m21s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
Duck 48mm x 18.28m All Purpose Duct Tape	\$5.99	help support different components (ex. Slide, back-ing,cardboard pieces etc)	12%	\$0.72
Stanley-National Hardware 1-Count 3/8-In x 3.08-in Zinc U-Bolt, 4-in	\$2.99	main part for the crank	100%	\$2.99
Stanley-National Hardware 3-in x 3/4 Zinc Brace Corner Brace	\$2.79	handle for the crank	100%	\$2.79
The Hillman Group 5/16-in Zinc-Plated Steel Standard (SAE) Fender Washer	\$0.36	keeps the handle and brace in place	100%	\$0.36
The Hillman Group 1/4-in-20 Steel Zinc-Plated Hex-Head Standard (SAE) Cap Bolts - 190063, 6-in	\$0.89	part of handle for the crank	100%	\$0.89
Stanley-National Hardware #8 Yellow Zinc Steel Flat-Head Square Standard (SAE) Deck Screw	\$38.99	supported all our wood pieces	\$0.15%	\$5.97
Wilton Celebrate It Oblong Pan 13”x9”	\$6.97	tray	100%	\$6.97
1 x 3 x 8 Kiln-Dried Douglas Fir Softwood	\$8.40	supports	25%	\$2.10
Top Choice 1 x 6 x 8 Kiln-Dried Eastern White Pine Softwood Board	\$16.79	trough	25%	\$4.20
Stanley-National Hardware 2-Pack 3.5-in Entry Door Hinge	\$6.29	helps tip our machine	50%	\$3.15
The Hillman Group 880796 5-count 6mm-1 Zinc Plated Metric Hex Nuts	\$1.59	secures our machine	200%	\$3.18
1/2 in x 4-ft x 8-ft Standard Spruce Plywood	\$25.38	base for our machine	25%	\$6.35
2 x 4 x 7 SPF Kiln-Dried White-wood Stud	\$2.79	pieces used to tip our machine	29%	\$0.81
Madison Mill 1.125-in x 48-in Round Poplar Dowel	\$4.79	rotates of crank	25%	\$1.20
Honey-Can-Do Bamboo 4-Compartment Cutlery Tray	\$11.79	sieve	100%	\$11.79
The Hillman Group 5/16-in Zinc-Plated Steel Standard (SAE) Fender Washer	\$0.36	secures or machine	1600%	\$5.76
The Hillman Group 5/16-in-18 Steel Zinc-Plated Round-Head Standard (SAE) Carriage Bolts - 240090, 2-in	\$0.48	secures our levels	800%	\$3.84
The Hillman Group 5/16-in-18 Zinc-Plated Standard (SAE) Hex Nut	\$0.14	secures bolts	800%	\$1.12
Quartet Project & Presentation Display Board, 48” x 36”	\$9.26	fills in those loose ends	25%	\$2.32
			TOTAL	\$66.48

Final design

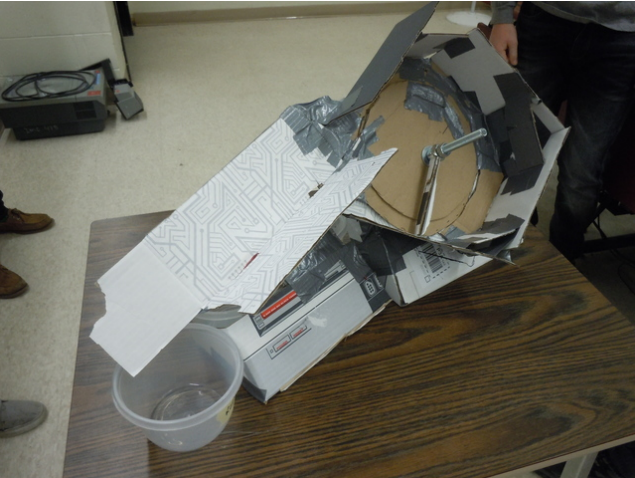


Watch video of the device in action: <https://youtu.be/IbaLWvTS9c?t=1m10s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
Duck 48mm x 18.28m All Purpose Duct Tape	\$5.48	help support different components (ex. Slide, back-ing,cardboard pieces etc)	90%	\$4.93
Stanley-National Hardware 1-Count 3/8-In x 3.08-in Zinc U-Bolt, 4-in	\$2.99	main part for the crank	100%	\$2.99
Stanley-National Hardware 3-in x 3/4 Zinc Brace Corner Brace	\$2.79	handle for the crank	100%	\$2.79
The Hillman Group 5/16-in Zinc-Plated Steel Standard (SAE) Fender Washer	\$0.36	keeps the handle and brace in place	100%	\$0.36
The Hillman Group 1/4-in-20 Steel Zinc-Plated Hex-Head Standard (SAE) Cap Bolts - 190063, 6-in	\$0.89	part of handle for the crank	100%	\$0.89
Stanley-National Hardware #8 Yellow Zinc Steel Flat-Head Square Standard (SAE) Deck Screw	\$38.99	supported all our wood pieces	\$0.15%	\$5.97
Bakers Supreme Oblong Pan	\$5.97	tray	100%	\$5.97
1 x 3 x 8 Kiln-Dried Douglas Fir Softwood	\$8.40	supports	25%	\$2.10
Top Choice 1 x 6 x 8 Kiln-Dried Eastern White Pine Softwood Board	\$16.79	trough	25%	\$4.20
Stanley-National Hardware 2-Pack 3.5-in Entry Door Hinge	\$6.29	helps tip our machine	50%	\$3.15
The Hillman Group 880796 5-count 6mm-1 Zinc Plated Metric Hex Nuts	\$1.59	secures our machine	200%	\$3.18
1/2 in x 4-ft x 8-ft Standard Spruce Plywood	\$24.62	base for our machine	12.5%	\$3.08
2 x 4 x 7 SPF Kiln-Dried White-wood Stud	\$2.79	pieces used to tip our machine	33%	\$0.92
Madison Mill 1.125-in x 48-in Round Poplar Dowel	\$4.79	rotates of crank	25%	\$1.20
Q Solutions Company CB Bambo Island Top	\$229.00	sieve	1%	\$2.29
The Hillman Group 5/16-in Zinc-Plated Steel Standard (SAE) Fender Washer	\$0.36	secures or machine	1600%	\$5.76
The Hillman Group 5/16-in-18 Steel Zinc-Plated Round-Head Standard (SAE) Carriage Bolts - 240090, 2-in	\$0.48	secures our levels	800%	\$3.84
The Hillman Group 5/16-in-18 Zinc-Plated Standard (SAE) Hex Nut	\$0.14	secures bolts	800%	\$1.12
Staples Corrugated Sheets 48: x 72” 5 bundle	\$30.72	fills in tose loose ends	10%	\$3.07
			TOTAL	\$57.80

Group 1-08

Prototype



Watch video of the device in action: <http://youtu.be/s5iV7S-dxm0?t=1m40s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
M-D Building Products 1-Pack 1.88-in x 3-ft White Vinyl Door Weatherstrip	\$11.49	Support for turbine	1/16	\$0.72
The Hillman Group 880475 1/2-in-13 Zinc-Plated Standard (SAE) Square Nut	\$1.59	Attatched to bolt, holds turbines arm in place.	100%	\$1.59
Large Cardboard Moving Box	\$1.99	Provides structure for the entire sorter.	50%	\$1.00
The Hillman Group 1/2-in-13 Steel Round-Head Standard (SAE) Zinc Carriage Bolts - 240324, 5-in	\$2.29	Arm that spins turbine	100%	\$2.29
The Hillman Group Zinc-Plated Steel Standard (SAE) Flat Washer - 126533 - 24 pack	\$2.79	Locks sqaure nut in place.	8%	\$0.22
2 X The Hillman Group 1/2-in-13 Zinc Plated Standard (SAE) Hex Nuts - 150015, 1-Pack	\$0.80	Locks washers in place	100%	\$0.80
GORILLA TAPE 2.5mm x 9m	\$3.48	Used as adhesive as well as smooth surface for coin	30%	\$1.04
Handy Duct Tape	\$4.98	Used as adhesive.	50%	\$2.49
GORILLA White Glue Pen				
			TOTAL	\$10.15

Final design



Watch video of the device in action: <https://youtu.be/IbaLWvTS9c?t=1m24s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
M-D Building Products 1-Pack 1.88-in x 3-ft White Vinyl Door Weatherstrip	\$11.49	Support for turbine	1/32	\$0.36
The Hillman Group 880475 1/2-in-13 Zinc-Plated Standard (SAE) Square Nut	\$1.59	Attatched to bolt, holds turbines arm in place.	100%	\$1.59
Large Cardboard Moving Box	\$2.23	Provides structure for the entire sorter.	25%	\$0.56
The Hillman Group 1/2-in-13 Steel Round-Head Standard (SAE) Zinc Carriage Bolts - 240324, 5-in	\$2.29	Arm that spins turbine	100%	\$2.29
The Hillman Group Zinc-Plated Steel Standard (SAE) Flat Washer - 126533 - 24 pack	\$2.79	Locks sqaure nut in place.	8.33%	\$0.23
2 X The Hillman Group 1/2-in-13 Zinc Plated Standard (SAE) Hex Nuts - 150015, 1-Pack	\$0.80	Locks washers in place	100%	\$0.80
GORILLA TAPE 2.5mm x 9m	\$3.48	Used as adhesive as	30%	\$1.04
Handy Duct Tape	\$4.98	Used as adhesive.	25%	\$1.25
GORILLA White Glue Pen	\$1.29	Used as adhesive.	25%	\$1.25
Small plastic bowl	\$1.29	Used as hopper	100%	\$1.29
			TOTAL	\$9.41

Group 1-09

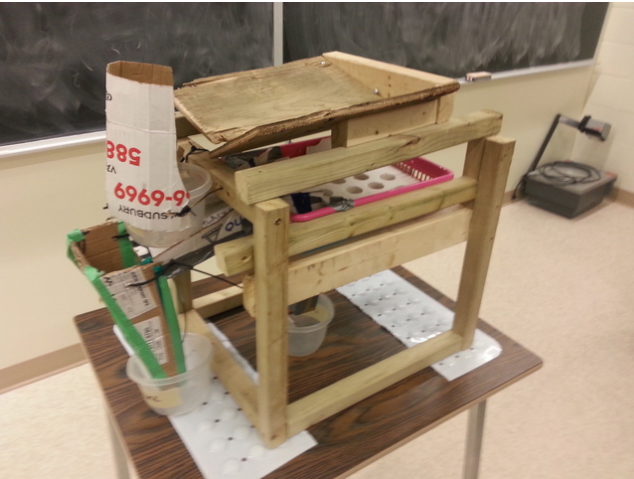
Prototype



Watch video of the device in action: <http://youtu.be/s5iV7S-dxm0?t=1m57s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
Elmer’s Craft Foam Sheets, 50/Pack	\$6.94	White Styrofoam (fits in buckets)	12%	\$0.83
Really Useful Boxes Mini 0.07 L Box	\$1.49	Coloured Buckets which act as sieves	200%	\$2.98
BluWood 2 x 2 x 8 Kiln-Dried SPF Dimensional Lumber	\$2.85	Wooden Balusters for Frame	600%	\$17.10
The Hillman Group 3/8-in-16 Steel Zinc-Plated Round-Head Standard (SAE) Carriage Bolts	\$1.59	Carriage Bolts (3/8” X 6”)	100%	\$1.59
The Hillman Group 3/8-in-16 Zinc-Plated All-Purpose Standard (SAE) Hex Nut	\$0.19	Hex Nuts (3/8”)	100%	\$0.19
Stanley-National Hardware #0 x 2-7/8-in Zinc-Plated Steel Standard (SAE) Eye Bolt	\$0.99	Large I hook	200%	\$1.98
The Hillman Group 3/8-in Zinc-Plated Steel Standard (SAE) Fender Washer	\$0.36	Washers	200%	\$0.72
Stanley-National Hardware #9 Flat-Head Square Standard (SAE) Deck Screw (1200-Pack)	\$44.99	Decking Screws 3”	1/54	\$0.83
Gorilla Glue Super Glue	\$6.99	super glue	50%	\$3.50
LePage 25ml Steel Epoxy	\$7.99	epoxy syringe	100%	\$7.99
Intertape Polymer Group AC10 Fix-It 50mm x 55m Duct Tape	\$4.49	duct tape	7.27%	\$0.33
			TOTAL	\$38.04

Final design

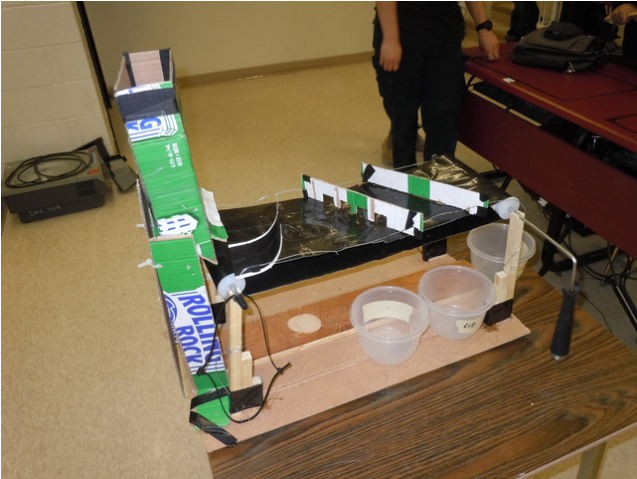


Watch video of the device in action: <https://youtu.be/IbaLWVwTS9c?t=1m33s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
Elmer’s Craft Foam Sheets, 50/Pack	\$6.94	White Styrofoam (fits in buckets)	12.4%	\$0.86
Really Useful Boxes Mini 0.07 L Box	\$1.49	Coloured Buckets which act as sieves	200%	\$2.98
PROGUARD 36-Inch Treated Wood Railing Baluster	\$0.98	Wooden Balusters for Frame	700%	\$6.86
The Hillman Group 3/8-in-16 Steel Zinc-Plated Round-Head Standard (SAE) Carriage Bolts	\$0.49	Carriage Bolts (3/8” X 6”)	200%	\$0.98
The Hillman Group 3/8-in-16 Zinc-Plated All-Purpose Standard (SAE) Hex Nut	\$0.19	Hex Nuts	200%	\$0.38
Stanley-National Hardware #0 x 2-7/8-in Zinc-Plated Steel Standard (SAE) Eye Bolt	\$0.99	Large I hook	400%	\$3.96
Zinc Plated Fender Washer 3/8 x 1-1/2” 1650/PCS Bulk Box 50/LBS	\$126.38	Washers	0.24%	\$0.31
Stanley-National Hardware #9 Flat-Head Square Standard (SAE) Deck Screw (1200-Pack)	\$44.99	Decking Screws 3”	1.83%	\$0.82
Krazy Glue All Purpose Original	\$1.87	super glue	100%	\$1.87
LePage Pres-tite Contact Cement 30ml	\$3.37	epoxy syringue	100%	\$3.37
Duct Tape	\$1.00	Duct Tape	20%	\$0.20
100 pk Cable Ties	\$3.19	Cable Ties	10%	\$0.32
Minnesota Trapline 14-Gauge Trappers Wire	\$9.99	steel wire	0.57%	\$0.06
Corrugated Boxes, 8” x 4” x 4”, 25/Bundle	\$8.75	Card Board (Was actually a Late Night Pizza Box)	1.33%	\$0.12
			TOTAL	\$23.08

Group 1-10

Prototype



Watch video of the device in action: <http://youtu.be/s5iV7S-dxm0?t=2m17s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
Nashua 394 9 mil General Purpose Duct Tape	\$6.75	Belt / Attachments	75%	\$5.06
2x2x8 Framing Lumber	\$2.44	Supports	60%	\$1.46
5-wire Roller Frame	\$5.99	Drums	175%	\$10.48
SuperGlaze 4043 .030 In. Aluminum Wire (1 lb.)	\$15.96	Railings	2%	\$0.32
2x2x8 Treated Wood	\$3.94	Support	12.5%	\$0.49
1/8 in. x 4 ft. x 8 ft. S2S MDF Tempered Hardboard	\$7.97	Base	25%	\$1.99
Arrow T2025 1/2" staples - Pack of 1000 staples	\$3.49	Attachments	1%	\$0.03
Lepage Carpenter'S Glue	\$4.97	Attachments	5%	\$0.25
Extra Large Box 22 Inch x 22 Inch x 21.5 Inch	\$3.97	Hopper / dividers	50%	\$1.99
Natural Cable Ties 14 Inches (Bag of 100)	\$7.97	Attachments	8%	\$0.64
			TOTAL	\$22.72

Final design

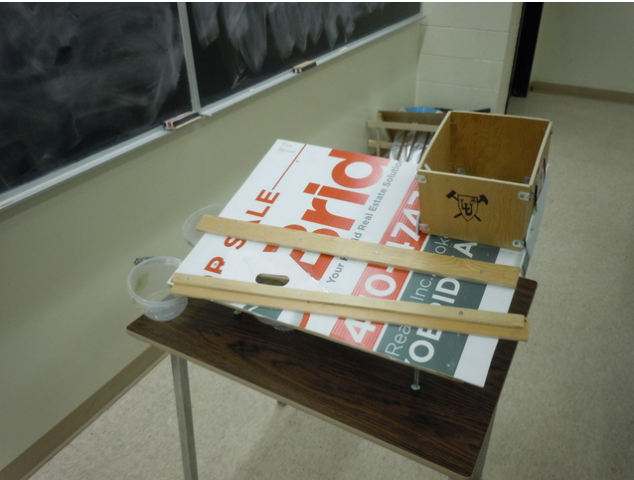


Watch video of the device in action: <https://youtu.be/IbaLWVwTS9c?t=1m45s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
2x4x8 Premium Western Red Cedar	\$8.63	Supports	40%	\$3.45
1/4 4x8 Oriented Strand Board	\$7.65	Base	50%	\$3.83
Hardwood Dowel 1 In. x 48 In. Natural	\$4.30	Drums	50%	\$2.15
Stretch Bamboo Rayon Jersey Knit Light Brown	\$10.98	Belt	80%	\$8.78
Poplar Hobby Board 1/4 x 2 x 3 Feet	\$2.22	Flitters	100%	\$2.22
#9x1 Inch Satin Nickel Wood Screw Phillips 100pk	\$3.48		8%	\$0.28
Stanley Bostitch Glue Gun Sticks, 24/Pack	\$6.59		5%	\$0.33
Staples Economy Rubber Bands, Size #24	\$1.43		10%	\$0.14
			TOTAL	\$21.18

Group 2-01

Prototype



Watch video of the device in action: <http://youtu.be/s5iV7S-dxm0?t=2m50s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
1/4 4x8 Oriented Strand Board	\$7.65	Half sheet of plywood required for shaking table	50%	\$3.83
1x2x8 Framing Lumber	\$1.09	Half length lumber required for support members	50%	\$0.55
48x96x0.157 White Corrugated Plastic Sheet	\$14.99	Low Friction surface for coin sliding	25%	\$3.75
3/4 Inch Zinc Corner Brace 4pk	\$1.18	Brackets to hold coin collector	200%	\$2.36
#9x1 Inch Satin Nickel Wood Screw Phillips 100pk	\$3.48	Screws to fasten device	50%	\$1.74
Scotch 3710 Packaging Tape 1 Pack	\$2.24	Tape	2.5%	\$0.06
1/4x2 1/2 GR2 Carriage Bolt	\$0.40	To adjust shaking table angle	400%	\$1.60
All Round Strapping, Galvanized, 24Ga 3/4 Inch x 25 Feet	\$6.09	To hold the collection containers	15%	\$0.91
			TOTAL	\$14.79

Final design



Watch video of the device in action: <https://youtu.be/IbaLWVwTS9c?t=2m12s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
1/4 4x8 Oriented Strand Board	\$7.65	Half sheet of plywood required for shaking table	100%	\$7.65
1x2x8 Framing Lumber	\$1.09	Half length lumber required for support members	50%	\$0.55
48x96x0.157 White Corrugated Plastic Sheet	\$14.99	Low Friction surface for coin sliding	25%	\$3.75
3/4 Inch Zinc Corner Brace 4pk	\$1.18	Brackets to hold coin collector	200%	\$2.36
#9x1 Inch Satin Nickel Wood Screw Phillips 100pk	\$3.48	Screws to fasten device	50%	\$1.74
Scotch 3710 Packaging Tape 1 Pack	\$2.24	Tape	2.5%	\$0.06
All Round Strapping, Galvanized, 24Ga 3/4 Inch x 25 Feet	\$6.09	To hold the collection containers	15%	\$0.91
			TOTAL	\$17.01

Group 2-02

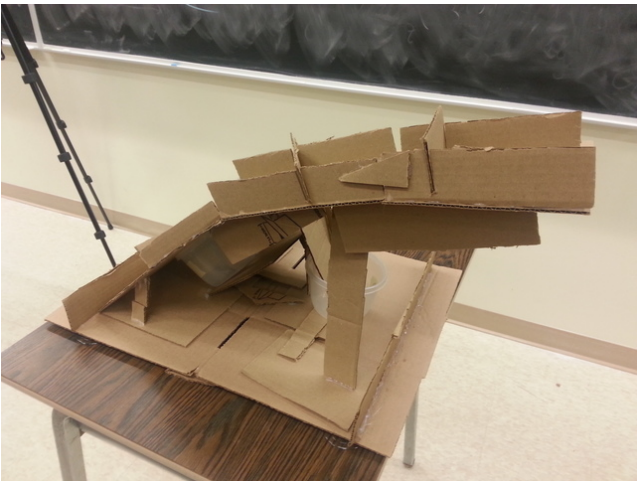
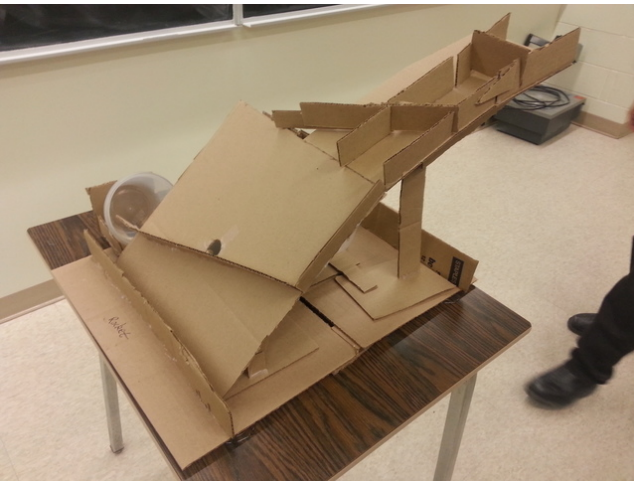
Prototype



Watch video of the device in action: <http://youtu.be/s5iV7S-dxm0?t=3m09s>

Product Description		Full Cost	Parts Used	Proportion of Total	Proportional Cost
Corrugated 12*12*6in,25/Bundle	Boxes	\$19.25	It is used half piece of one of 25 boxes	2%	\$0.39
Poster Board 22*28in white 10/pack		\$6.70	It is used 1/4 piece of one of 10 boards	2.5%	\$0.17
Aurora tools glue sticks 7/16*4 100/pack		\$35.50	it is used 4 of them	4%	\$1.42
scotch magic tape 19mm*25 boxed 4/pack		\$10.79	it is only used 20cm out of 25m tape	0.2%	\$0.02
				TOTAL	\$1.99

Final design

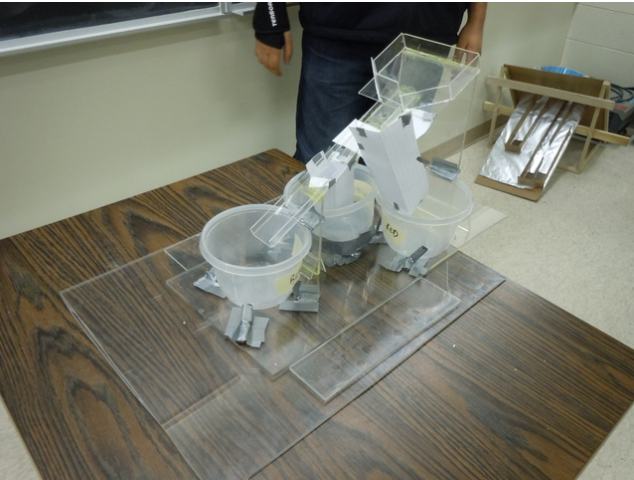


Watch video of the device in action: <https://youtu.be/IbaLWVwTS9c?t=2m24s>

Product Description		Full Cost	Parts Used	Proportion of Total	Proportional Cost
Corrugated 12*12*6in,25/Bundle	Boxes	\$19.25	It is used 2 out of 25 for whole body	8%	\$1.54
Aurora tools glue sticks 7/16*4 100/pack		\$35.50	it is used 6 of 100 to glue them together	6%	\$2.13
Large Suction Hooks		\$4.39	it is used 2 to stick them on table	200%	\$8.78
				TOTAL	\$12.45

Group 2-03

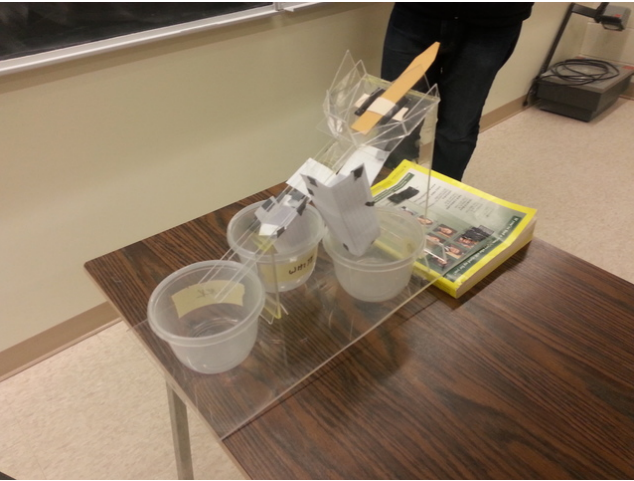
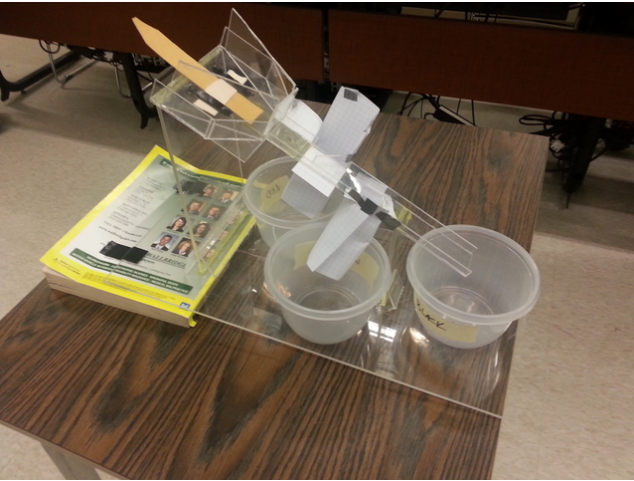
Prototype



Watch video of the device in action: <http://youtu.be/s5iV7S-dxm0?t=3m17s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
HP FSC-Certified Multipurpose Paper, 20 lb., 8 1/2" x 11", Ream	\$7.36	2 sheets of 500 used	4%	\$0.03
Staples Premium Duct Tape, 48mm x 55m	\$4.94	1 metre of 55 used	1.82%	\$0.09
OPTIX 6-ft x 3-ft x .118-in Clear Acrylic Sheet	\$104.00	423 out of 2592 square inches	16.32%	\$16.97
Oatey Low VOC ABS Medium Yellow Cement, 4-oz (118ml)	\$4.49	About 1/3 used	33.33%	\$1.50
OPTIX 10-in x 8-in x .080-in Clear Acrylic Sheet	\$2.49	Used 1 and a half sheets	150%	\$3.74
			TOTAL	\$22.32

Final design

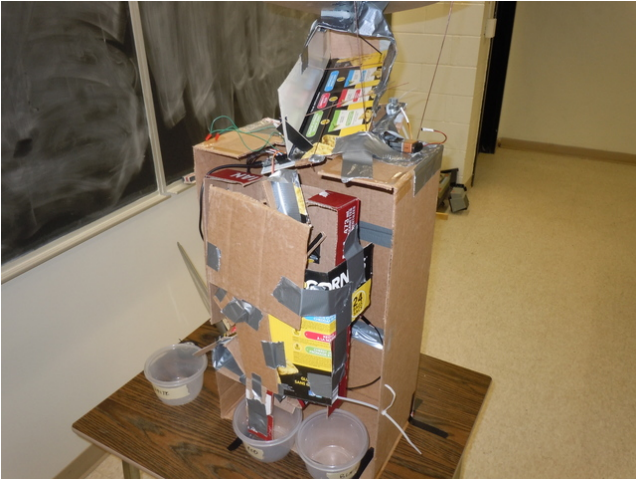


Watch video of the device in action: <https://youtu.be/IbaLWvTS9c?t=2m34s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
HP FSC-Certified Multipurpose Paper, 20 lb., 8 1/2" x 11", Ream	\$7.36	2 sheets of 500 used	4%	\$0.03
Staples Premium Duct Tape, 48mm x 55m	\$4.94	0.1 metre of 55 used	0.18%	\$0.01
OPTIX 6-ft x 3-ft x .118-in Clear Acrylic Sheet	\$104.00	180 out of 2592 square inches	6.94%	\$7.22
Oatey Low VOC ABS Medium Yellow Cement, 4-oz (118ml)	\$4.79	About 1/3 used	33.33%	\$1.60
OPTIX 10-in x 8-in x .080-in Clear Acrylic Sheet	\$2.49	Used 1 and a half sheets	150%	\$3.74
Staples 30% Recycled FSC-Certified Copy Paper, 20 lb., 8-1/2" x 11", Ream	\$6.75	Used half ream	50%	\$3.38
Domtar FirstChoice FSC-Certified Cover & Card Stock, 65 lb., 8-1/2" x 11", White, 250/Ream (#85701)	\$13.44	Used quarter of one sheet	1%	\$0.01
			TOTAL	\$15.98

Group 2-04

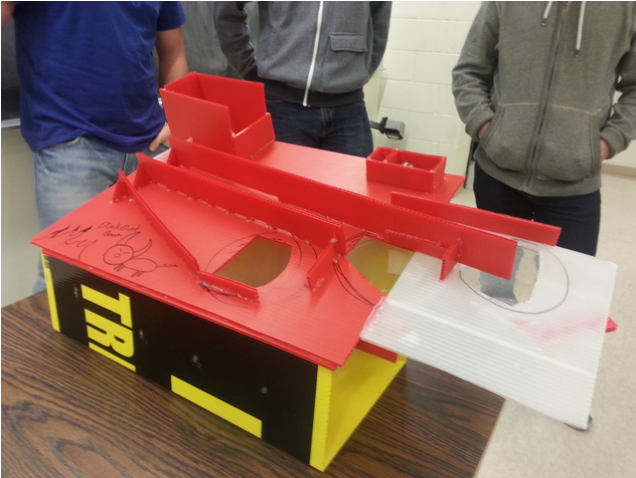
Prototype



Watch video of the device in action: <http://youtu.be/s5iV7S-dxm0?t=3m36s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
24x24x24" Cardboard box	\$3.62		100%	\$3.62
24x12x12" Cardboard box	\$1.36		100%	\$1.36
3000RPM 3-6V DC 2 Wired High Torque Mini Micro Vibration Motor	\$3.60		100%	\$3.60
Scotch Pro Strength Duct Tape, Grey, 1.88-Inchx60-Yard	\$2.50	1 roll, 1/4 of roll needed	25%	\$0.63
DFRobot Color Sensor TCS3200	\$9.29		100%	\$9.29
DFRobot Micro Servo Motor	\$4.12	3 required. Sold seperatly	300%	\$11.64
Lincoln Electric Welding Rod	\$8.39	Pack of 24, 6 needed	25%	\$2.10
Perma-Proto Half-Sized Breadboard PCB Kit	\$7.27		100%	\$7.27
2000 Adafruit Industries LLC — 1528-1039-ND	\$121.15	package of 10, one used	10%	\$12.12
Surebonder DT-100 All Temperature Mini 100 Glue Sticks, 4-Inch	\$15.00	Pack of 100, 1/2 of one stick needed	5%	\$0.05
Duracell Coppertop 9V	\$12.47	Pack of 4, two needed	50%	\$6.24
SEA-02 Servo Extender Cable - 12"	\$2.29	2 required. Sold seperatly	200%	\$4.58
			TOTAL	\$62.48

Final design

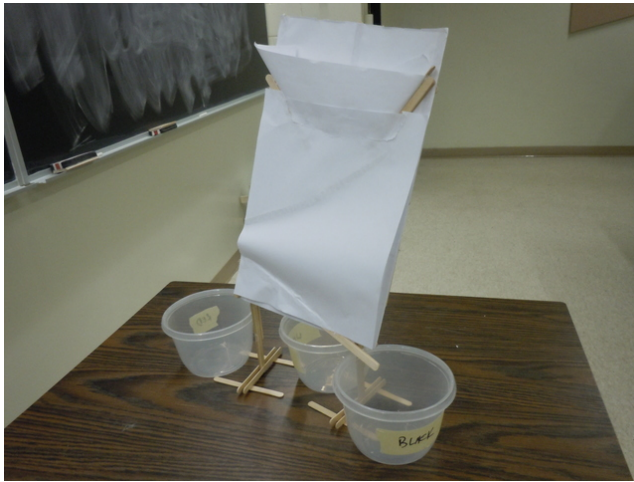


Watch video of the device in action: <https://youtu.be/IbaLWwTS9c?t=2m44s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
Surebonder DT-100 All Temperature Mini 100 Glue Sticks, 4-Inch	\$9.67	Pack of 100, 10 sticks needed	10%	\$0.97
Staples Reusable Adhesive Putty, 56 g, Blue	\$2.93	Pack of 10, 5 needed.	50%	\$1.47
White Corrugated Plastic Sheet - .157 Inch x 48 Inch x 96 Inch	\$26.96	One third of a sheet needed per unit	33%	\$8.90
4130 STEEL ROD COLD FINISHED (1 INCH DIAMETER)	\$12.55	12" piece, 1" needed per unit	8.33%	\$1.05
Select Jute Twine - 495 Ft. roll	\$5.97	495ft roll, 1 ft used	2%	\$0.01
			TOTAL	\$12.37

Group 2-05

Prototype



Watch video of the device in action: <http://youtu.be/s5iV7S-dxm0?t=4m00s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
Elmer's Craft Sticks, 11.43 X 0.96 cm, 4.5 X 0.38-Inch, 1000-Count, Natural	\$8.99	Popsicle sticks 70/1000	4/57	\$0.63
Crayola 118 ml project glue	\$1.76	20z/40z glue	1/2	\$0.88
Domtar Multi-use paper	\$34.97	3 sheets of paper/5000	0.0006%	\$0.02
			TOTAL	\$1.53

Final design

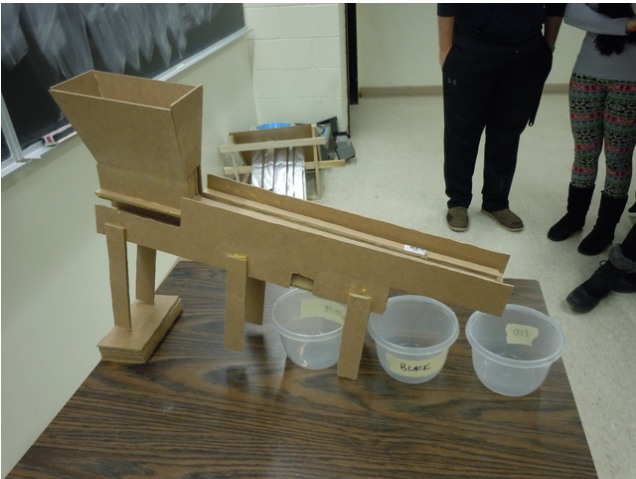


Watch video of the device in action: <https://youtu.be/IbaLWVwTS9c?t=2m57s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
Elmer's Craft Sticks, 11.43 X 0.96 cm, 4.5 X 0.38-Inch, 1000-Count, Natural	\$8.99	Popsicle sticks 60/1000	3/50	\$0.54
Crayola 118 ml project glue	\$1.76	10z/40z glue	1/4	\$0.44
Domtar Multi-use paper	\$34.97	5 sheets of paper/5000	001%	\$0.03
			TOTAL	\$1.01

Group 2-06

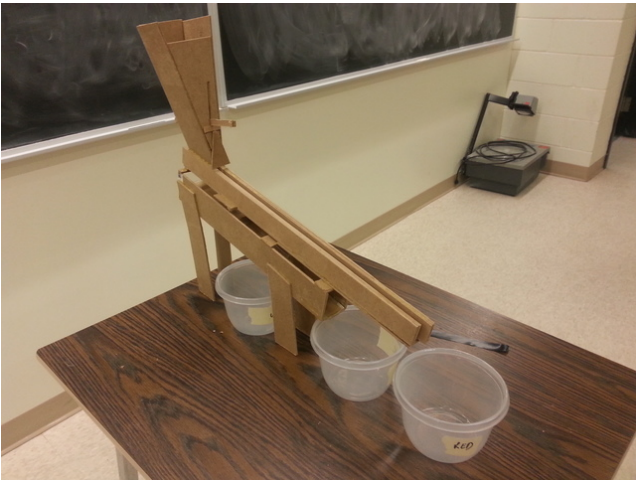
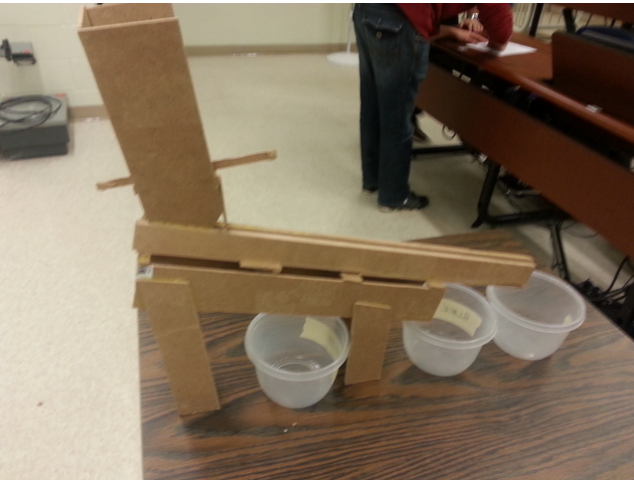
Prototype



Watch video of the device in action: <http://youtu.be/s5iV7S-dxm0?t=4m05s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
Goodfellow 1/8 Inch 2 Feet x 4 Feet White Hardboard Handy Panel	\$4.46	Used a panel and a half for one device	150%	\$6.69
Lepage Carpenter'S Glue	\$4.97	Used a full bottle of glue	100%	\$4.97
			TOTAL	\$11.66

Final design

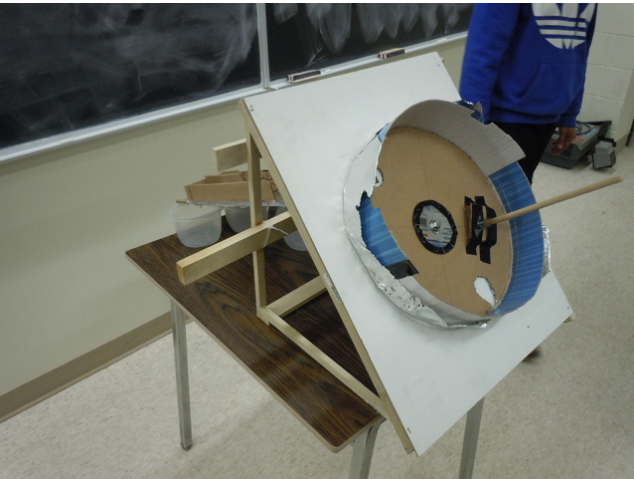


Watch video of the device in action: <https://youtu.be/IbaLWwTS9c?t=3m09s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
Goodfellow 1/8 Inch 2 Feet x 4 Feet White Hardboard Handy Panel	\$4.46	Used a panel and a half for one device	150%	\$6.69
Lepage Carpenter'S Glue	\$4.97	Used a full bottle of glue	100%	\$4.97
High Impact Acrylic Sheet - .093 Inch x 8 Inch x 10 Inch	\$6.97	Used a half of sheet	50%	\$3.49
			TOTAL	\$15.15

Group 2-07

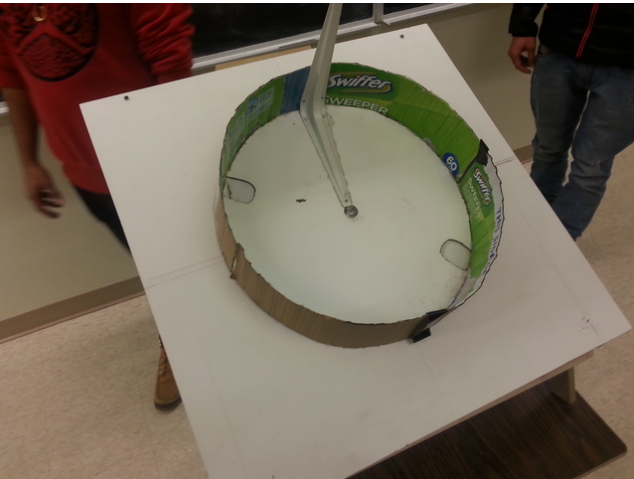
Prototype



Watch video of the device in action: <http://youtu.be/s5iV7S-dxm0?t=4m20s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
THD Generic - Small Moving Box	\$0.99	design desk	100%	\$0.99
1x2x8 Framing Lumber	\$1.09	desgin frame	400%	\$4.36
Handi-Foil Aluminum Foil, 250-ft	\$9.99	reduce friction	20%	\$2.00
Buildex Grade 5 Hex Bolt, Coarse Threaded Zinc, 1/4-in	\$2.99	to attach the disk	100%	\$2.99
4-ft x 8-ft Lauan Utility Plywood Underlayment Panel	\$19.99	to put the disk on it	30%	\$4.50
			TOTAL	\$14.84

Final design



Watch video of the device in action: <https://youtu.be/IbaLWvTS9c?t=3m23s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
Small Moving Box	\$0.99	design desk	25%	\$0.25
Framing Lumber	\$1.09	desgin frame	800%	\$8.72
Handi-Foil Aluminum Foil	\$9.99	reduce friction	20%	\$2.00
Buildex Grade 5 Hex Bolt, Coarse Threaded Zinc, 1/4-in	\$2.99	to attach the disk	100%	\$2.99
Lauan Utility Plywood Underlay-ment Panel	\$15.00	to put the disk on it	30%	\$4.50
White Shelf Bracket	\$1.87	to control the disk	100%	\$1.87
			TOTAL	\$20.33

Group 2-08

Final design

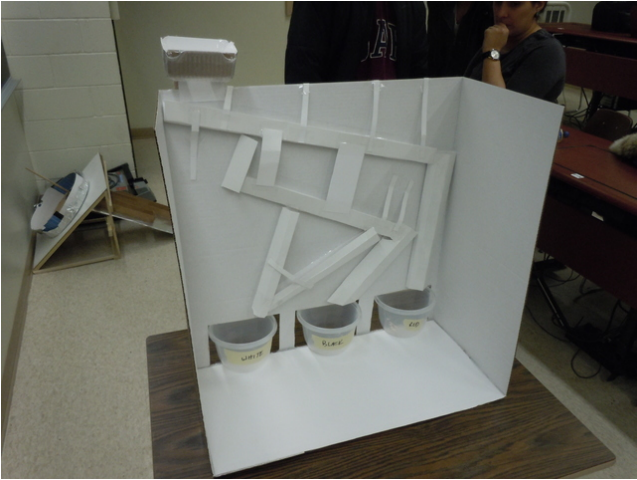
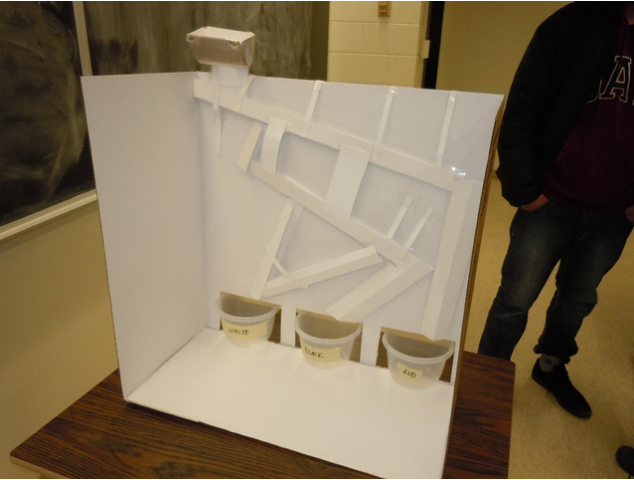


Watch video of the device in action: <https://youtu.be/IbaLWvTS9c?t=3m39s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
6x3/4 Flat Hd Soc Wood Screw 100/Bx	\$4.29	screws to connect the parts together	12%	\$0.51
1/8 Inch 2 Feet x 4 Feet White Hardboard Handy Panel	\$4.46	as material base of the sorter	100%	\$4.46
Pine Shop Shelving #1 3/4 Inch 12 Inch x 36 Inch	\$11.20	as base to self support the device	100%	\$11.20
Martha Stewart Crafts Glue Gun Refill Glue Sticks 12 pack	\$3.97	to connect peaces of the boxes	16.66%	\$0.66
Heavy Duty Small Box 16 Inch x 12 Inch x 12 Inch	\$2.97	making routs to each coin	100%	\$2.97
Staples Premium Duct Tape, 48mm x 55m	\$4.94	to stick some parts together	10%	\$0.49
1 1/2" Drive Pin, 25 Pack	\$5.98	to connect the peaces of woods together	16%	\$0.96
			TOTAL	\$21.26

Group 2-09

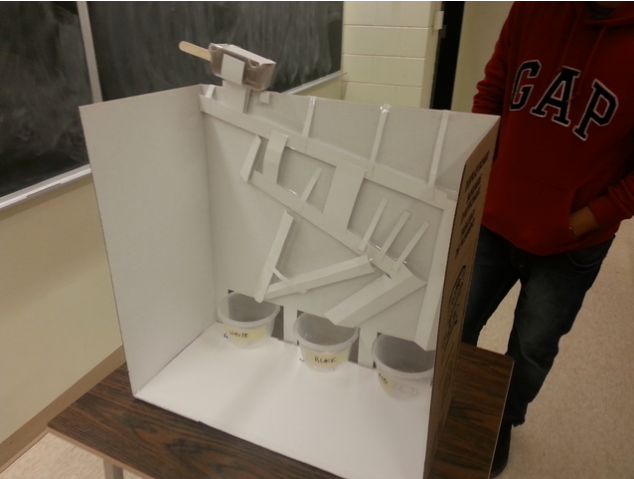
Prototype



Watch video of the device in action: <http://youtu.be/s5iV7S-dxm0?t=4m37s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
Small Trifold Display Board	\$4.97	base	100%	\$4.97
White Poster Board 8 Pack 14x22	\$3.97	1.25 posters (coins path)	15%	\$0.60
Elmer's Regular Craft Sticks	\$3.50	4 sticks	2.66%	\$0.09
Duck Brand Clear Packaging Tape 54 YD	\$1.48	approximately 4m/50m used in the posters	8%	\$0.12
COOL GLUE Gluesticks - 15-pack	\$3.47	6 sticks used in the display board	40%	\$1.39
Great Value Small Oval Containers & Lids	\$2.77	coins funnel (1 of 8)	12.5%	\$0.35
			TOTAL	\$7.51

Final design



Watch video of the device in action: <https://youtu.be/IbaLWwTS9c?t=3m55s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
Small Trifold Display Board	\$4.97	base	100%	\$4.97
White Poster Board 8 Pack 14x22	\$3.97	1.25 posters (coins path)	15%	\$0.60
Elmer's Regular Craft Sticks	\$3.00	4 sticks	2.66%	\$0.08
Duck Brand Clear Packaging Tape 54 YD	\$1.48	approximately 4m/50m used in the posters	8%	\$0.12
COOL GLUE Gluesticks - 15-pack	\$3.47	6 sticks used in the display board	40%	\$1.39
Great Value Small Oval Containers & Lids	\$2.77	coins funnel	12.5%	\$0.35
			TOTAL	\$7.50

Group 2-11

Prototype



Watch video of the device in action: <http://youtu.be/s5iV7S-dxm0?t=4m45s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
Madison Mill 0.31-in x 48-in Round Poplar Dowel	\$0.89	12"/48"	25%	\$0.22
Staples Copy Paper, 20 lb., 8-1/2" x 11", Case	\$46.21	2 Pieces of Paper/5000	0.04%	\$0.02
Staples Premium Duct Tape, 48mm x 55m	\$4.94	4 Feet/180	2.22%	\$0.11
Medium Cardboard Moving Box	\$1.49	1 Box	100%	\$1.49
			TOTAL	\$1.84

Final design



Watch video of the device in action: <https://youtu.be/IbaLWwTS9c?t=4m10s>

Product Description	Full Cost	Parts Used	Proportion of Total	Proportional Cost
Madison Mill 0.31-in x 48-in Round Poplar Dowel	\$0.89	16"/48"	33.33%	\$0.30
Staples Copy Paper, 20 lb., 8-1/2" x 11", Case	\$49.96	3 Pieces of Paper/5000	0.06%	\$0.03
Staples Premium Duct Tape, 48mm x 55m	\$4.94	3 Feet/180	1.67%	\$0.08
Medium Cardboard Moving Box	\$1.67	1/2 Box	50%	\$0.84
Arrow Fastener 24-Pack 5/16-in General Purpose Glue Sticks	\$5.99	1.5/24	6.25%	\$0.37
			TOTAL	\$1.62