CooperStandard

SAY DETROIT: SCIENCE IN THE DEEP SUPPORT

Buoyancy Competition Project Result

June 05, 2017

Making Waves

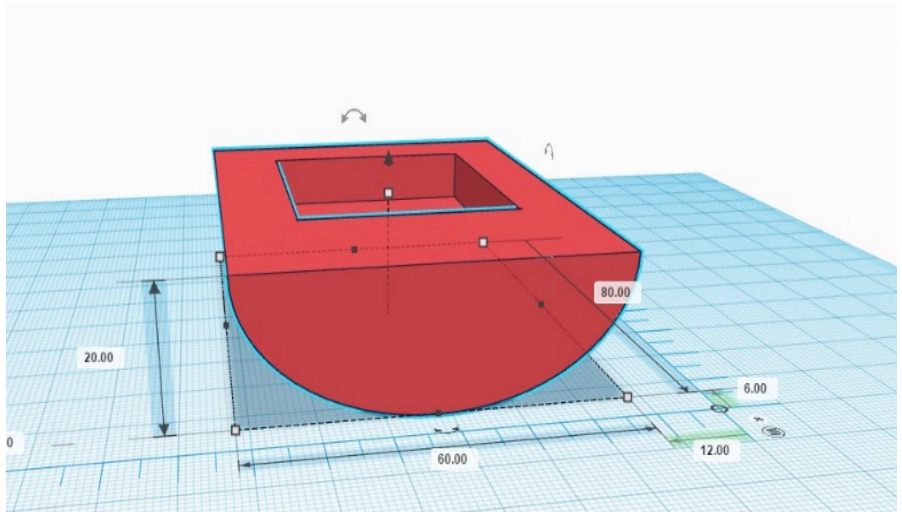
Performance Metrics

Type of Test	Design Requirement	Performance Data
Baseline Test	Dimensions of Boat <= (80mm x 60mm x 20mm)	80mm x 60mm x 20mm
	Weight of Boat	48g
	Floats on a body of water ?	Yes
	Boat Holds >=5g of Weight ?	Yes
	Maximum Weight Boat Can Hold (and Float)	21.8g
Drop Test	Damage when dropped from 3 feet?	No
	Floats on a body of water after drop test	Yes

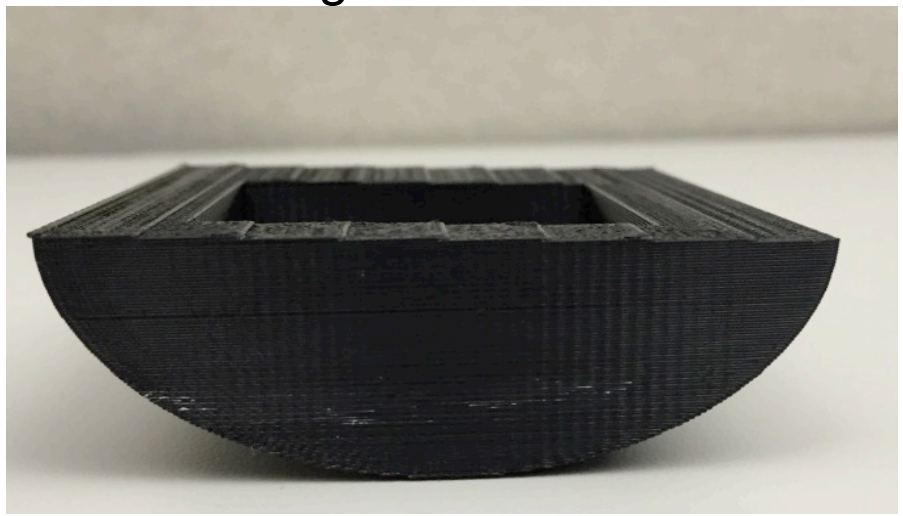
Cost Metrics

Direct Labor Rate	$	11.00	/hr
3D Print OH Rate	$	11.00	/hr
Target Selling price:	$	50.00	/pc
Material Cost	$	18.33	
Direct Labor	$	34.65	
3D print cost	$	34.65	
Manufacturing Cost	$	87.63	
Gross margin $	$	(37.63)	
Gross margin %		-75%	

Tinker CAD Model



3D Design Print



Cadillacs

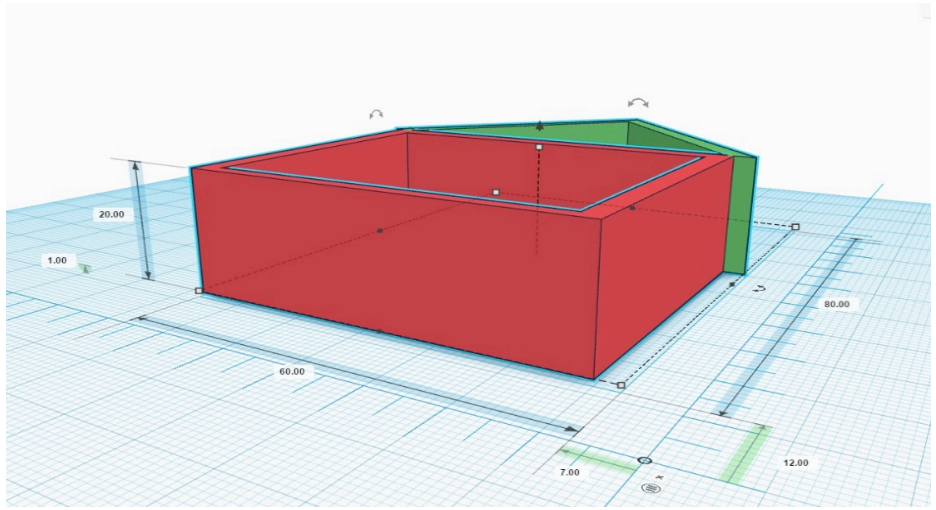
- Performance Metrics

Type of Test	Design Requirement	Performance Data
Baseline Test	Dimensions of Boat <= (80mm x 60mm x 20mm)	80mm x 60mm x 20mm
	Weight of Boat	21g
	Floats on a body of water ?	Yes
	Boat Holds >=5g of Weight ?	Yes
	Maximum Weight Boat Can Hold (and Float)	31g
Drop Test	Damage when dropped from 3 feet?	No
	Floats on a body of water after drop test	Yes

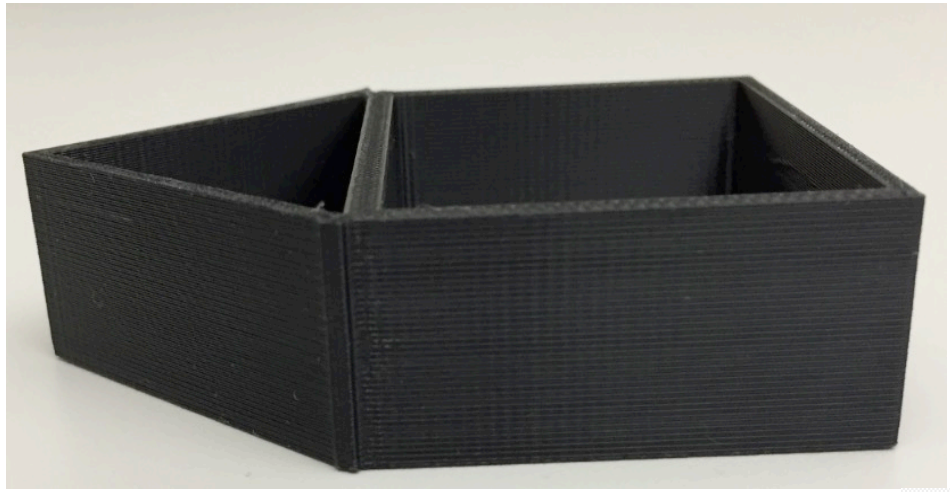
- Cost Metrics

Direct Labor Rate	$	11.00	/hr
3D Print OH Rate	$	11.00	/hr
Target Selling price:	$	50.00	/pc
Material Cost		$7.16	
Direct Labor	$	13.20	
3D print cost	$	13.20	
Manufacturing Cost	$	33.56	
Gross margin $	$	16.44	
Gross margin %		33%	

- Tinker CAD Model



- 3D Design Print



Rich & Famous Boats

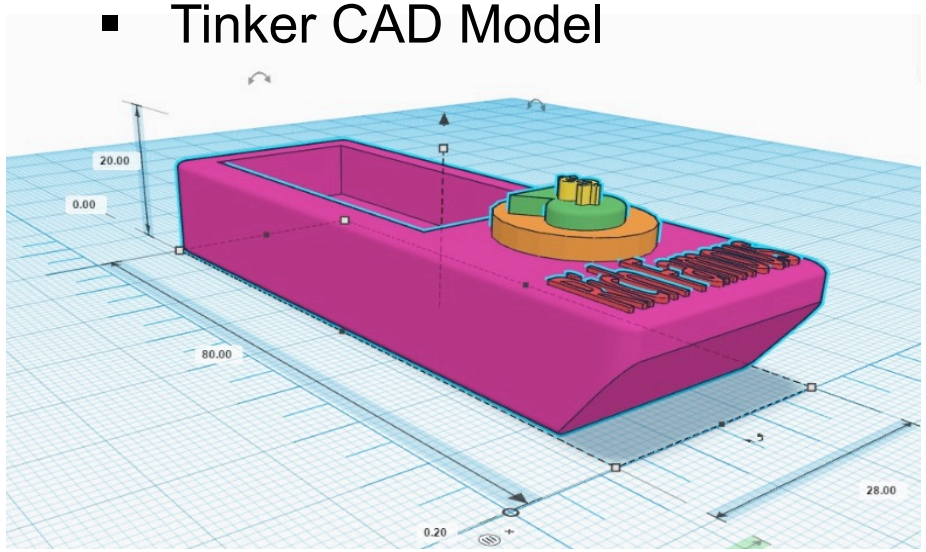
- Performance Metrics

Type of Test	Design Requirement	Performance Data
Baseline Test	Dimensions of Boat <= (80mm x 60mm x 20mm)	80mm x 28mm x 20mm
	Weight of Boat	12g
	Floats on a body of water ?	Yes
	Boat Holds >=5g of Weight ?	Yes
	Maximum Weight Boat Can Hold (and Float)	10g
Drop Test	Damage when dropped from 3 feet?	No
	Floats on a body of water after drop test	Yes

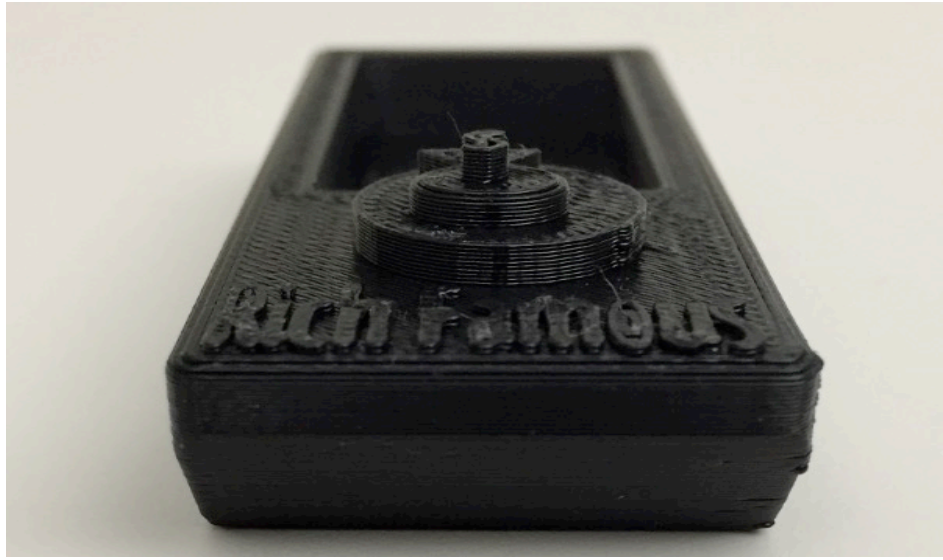
- Cost Metrics

Cost Calculation:			
Direct Labor Rate	$	11.00	/hr
3D Print OH Rate	$	11.00	/hr
Target Selling price:	$	50.00	/pc
Material Cost		$4.34	
Direct Labor	$	8.58	
3D print cost	$	8.58	
Manufacturing Cost	$	21.50	
Gross margin $	$	28.50	
Gross margin %		57%	

- Tinker CAD Model



- 3D Design Print

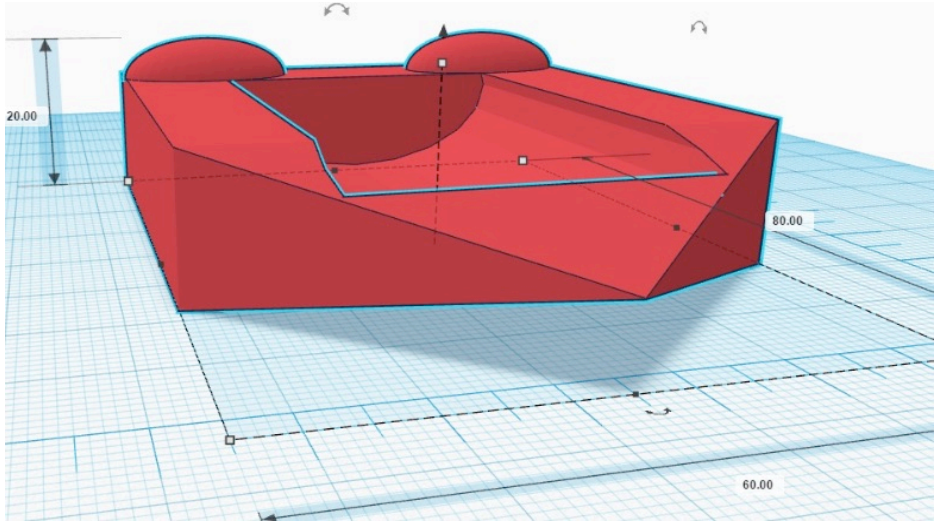


River Renegades

Performance Metrics

Type of Test	Design Requirements	Performance Data
Baseline Test	Dimensions of Boat <= (80mm x 60mm x 20mm)	80mm x 60mm x 20mm
	Weight of Boat	32g
	Floats on a body of water ?	Yes
	Boat Holds >=5g of Weight ?	Yes
	Maximum Weight Boat Can Hold (and Float)	15g
Drop Test	Damage when dropped from 3 feet?	No
	Floats on a body of water after drop test	Yes

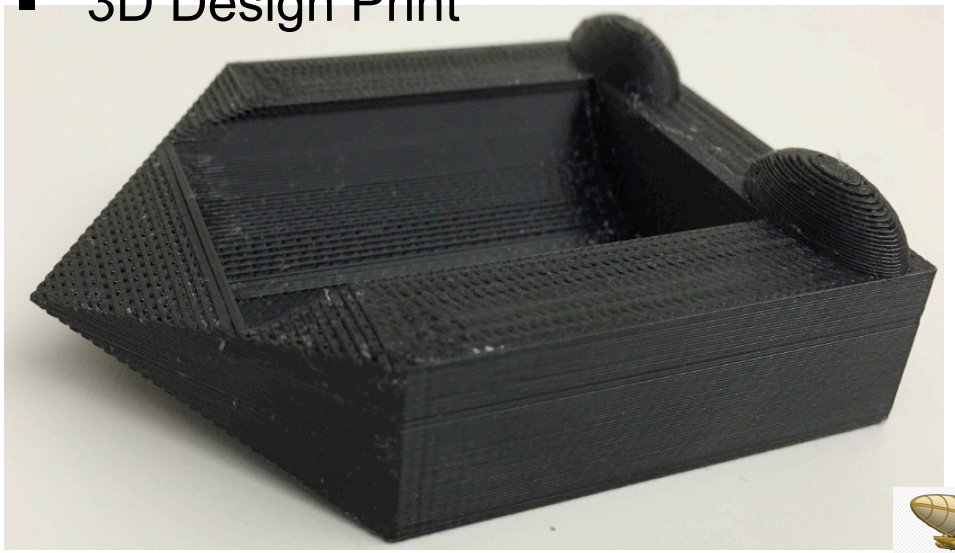
Tinker CAD Model



Cost Metrics

Cost Summary			
Direct Labor Rate	$	11.00	/hr
3D Print OH Rate	$	11.00	/hr
Target Selling price:	$	50.00	/pc
Material Cost		$10.95	
Direct Labor	$	20.35	
3D print cost	$	20.35	
Manufacturing Cost	$	51.65	
Gross margin $	$	(1.65)	
Gross margin %		-3%	

3D Design Print



The Jays

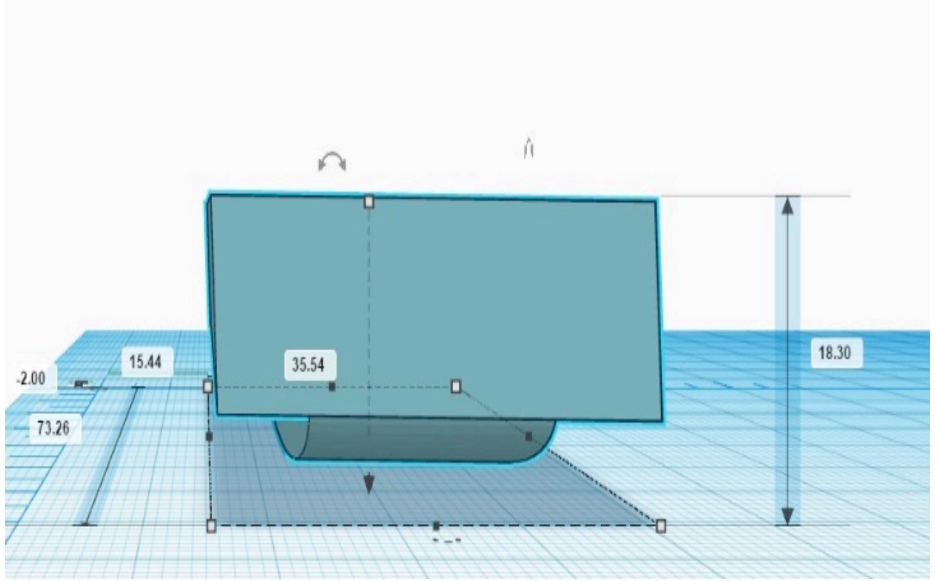
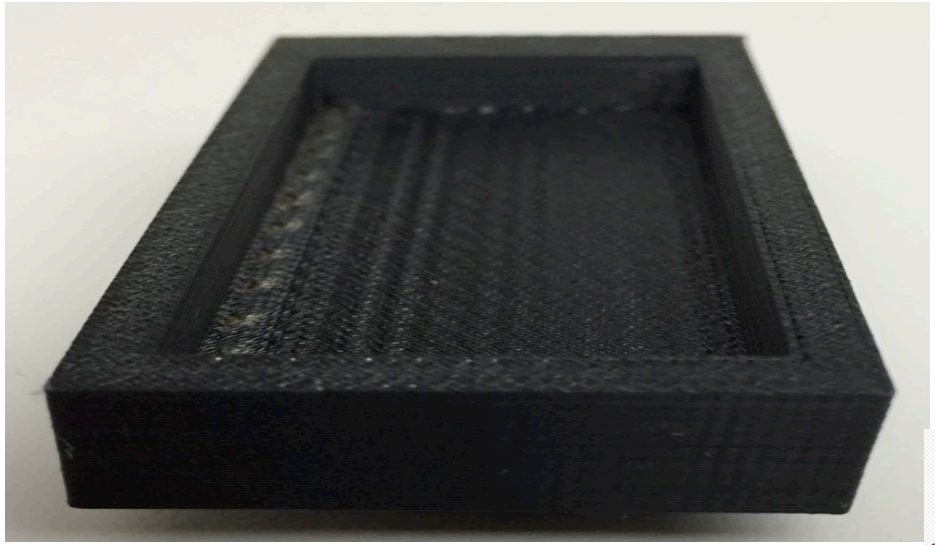
- Performance Metrics

Type of Test	Design Requirement	Performance Data
Baseline Test	Dimensions of Boat <= (80mm x 60mm x 20mm)	73.3mm x 35.5mm x 18.3mm
	Weight of Boat	21g
	Floats on a body of water ?	Yes
	Boat Holds >=5g of Weight ?	Yes
	Maximum Weight Boat Can Hold (and Float)	12.23g
Drop Test	Damage when dropped from 3 feet?	No
	Floats on a body of water after drop test	Yes

- Cost Metrics

Direct Labor Rate	$	11.00	/hr
3D Print OH Rate	$	11.00	/hr
Target Selling price:	$	50.00	/pc
Material Cost	$	5.98	
Direct Labor	$	13.42	
3D print cost	$	13.42	
Manufacturing Cost	$	32.82	
Gross margin $	$	17.18	
Gross margin %		34%	

- Tinker CAD Model



- 3D Design Print