

Project
Manager
Ali Alkhaiyat

STEM Display B

Secretary &
Client Contact
David Rankin

Team 15



Budget
Liaison
Carlos Shields

Website
Developer
Kevin Park

[1]

Project Description



The Wonder Factory

Interactive center of
Science, Technology,
Engineering, Art, and Math
(STEM/STEAM) in Flagstaff,
AZ

[1]

Project Description

- Must be safe to all users per applicable safety standards. Safety is your first priority!!
- Must be ready upon completion of this capstone sequence
- Should generate up to 100 ideas – including existing, new, wacky, and off the wall concepts
- Must select, design, build, and test one final unique idea
- Should test the interactive display in a similar setting to expected everyday use
- Must raise some of the funds required to finish the project
- Must interact with the clients in order to maintain parity with their expectations

Design Considered

Concept Generation

- C-sketch, 4-1-2, and individual brainstorming

Pugh Chart

- To show advantage and disadvantage

Designs Considered

Customer Requirements	Design Ideas								Designs Considered											
	air cannon	light shadow	smoke manipulation	mirror room	music with water cups	moment machine	clay car build and race	engineering puzzle	popsicle stick house	bridge design and build	gear powered race	compressed air organ	dam to generate power	plane in a box	treadmill candy machine	gear puzzle	gear powered lights	bicycle power game	catapult game	
Portable	0	-1	0	-1	0	-1	0	0	0	0	-1	-1	0	-1	1	0	0	-1	-1	
Safety	-1	0	-1	0	0	-1	0	1	1	1	0	0	0	-1	0	0	0	0	-1	
Mutiple Users	-1	0	-1	0	0	-1	1	0	1	1	1	1	1	0	1	0	0	0	1	
Tactile	0	-1	1	-1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	
Auditory	1	-1	-1	-1	1	-1	-1	-1	-1	1	1	-1	0	-1	1	1	0	1	-1	
Visual	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Project into role	0	-1	0	-1	0	1	1	1	1	1	1	1	1	-1	0	1	1	-1	0	
Feel smart	0	1	-1	0	1	1	0	0	1	0	1	0	0	0	1	0	1	0	0	
Simple	1	1	1	1	1	1	-1	1	1	1	1	1	0	1	0	1	-1	1	1	
Positives	3	3	3	2	5	5	4	5	7	7	7	5	3	3	6	5	4	4	4	
Negatives	2	4	4	4	0	4	2	1	1	0	1	2	0	4	0	0	1	2	3	
Same	4	2	2	3	4	0	3	3	1	2	1	2	6	2	3	4	4	3	2	
Total	1	-1	-1	-2	5	1	2	0	4	6	7	6	3	3	-1	6	5	3	2	1

Design Selected - An Engineer's Pit Race

Customer Requirements	Design Ideas bridge design and build	gear powered race	compressed air organ	gear puzzle	New Design: An Engineer's Pit Race
Portable	0	0	-1	1	1
Safety	1	1	0	0	1
Mutiple Users	1	1	1	1	1
Tactile	1	1	1	1	1
Auditory	-1	1	1	1	1
Visual	1	1	1	1	1
Project into role	1	1	1	0	1
Feel smart	1	0	1	1	1
Simple	1	1	1	0	1
Positives	7	7	7	6	9
Negatives	1	0	1	0	0
Same	1	2	1	3	0
Total	6	7	6	6	9

Users are counted down to start the race. Each user must determine which gears/crank arms to install based on how much power they want, how difficult the generator will be to turn, and which gears will mesh. Then, the user must complete an electric circuit to transfer power to the racetrack where users will race each other.

Schedule - Gantt Chart

	Start Date	End Date	Duration	Accountable	Week 6	Week 7					Week 8					Week 9								
					3-Oct	12-Oct	13-Oct	14-Oct	15-Oct	16-Oct	17-Oct	18-Oct	19-Oct	20-Oct	21-Oct	22-Oct	23-Oct	24-Oct	25-Oct	26-Oct	27-Oct	28-Oct	29-Oct	30-Oct
Preliminary project	3-Oct	28-Oct	26d	Team																				
Team Meeting Minutes Week 6	3-Oct	3-Oct	1d	Juan Shields																				
Team Meeting Minutes Week 7	17-Oct	17-Oct	1d	David Rankin																				
Concepts Generation	17-Oct	17-Oct	1d	Team																				
Concepts Evaluation	17-Oct	17-Oct	1d	Team																				
Staff Meeting 2	19-Oct	19-Oct	1d	Team																				
Presentation 2	20-Oct	26-Oct	7d	Team																				
Preliminary Report	3-Oct	28-Oct	26d	Team																				
Background	12-Oct	20-Oct	9d	David Rankin																				
Requirements	13-Oct	21-Oct	9d	Ali Alkhaiyat																				
Existing Design	14-Oct	22-Oct	9d	Team																				
System Level and Subsystem Level	15-Oct	23-Oct	9d	Team																				
Functional Decomposition	16-Oct	24-Oct	9d	Ali Alkhaiyat																				
Design Considered	17-Oct	25-Oct	9d	Shields/Park																				
Design Selected	18-Oct	26-Oct	9d	David Rankin																				
Format	19-Oct	27-Oct	9d	Team																				
Updates	20-Oct	28-Oct	9d	Team																				
Wonder Factory Meeting 2	27-Oct	27-Oct	1d	Team																				
Analytical Analysis Topics Memo	28-Oct	30-Oct	3d	Team																				

	Start Date	End Date	Duration	Accountable	Week 10	Week 11			Week 12					Week 13					Week 14		Week 15							
					31-Oct	11-Nov	12-Nov	13-Nov	14-Nov	15-Nov	16-Nov	17-Nov	18-Nov	19-Nov	20-Nov	21-Nov	22-Nov	23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	30-Nov	5-Dec	6-Dec	7-Dec	8-Dec	9-Dec
Final Project	31-Oct	11/25/2016	26d	Team																								
Team meeting Minutes Week 10	31-Oct	31-Oct	1d	Team																								
Team meeting Minutes Week 11	12-Nov	12-Nov	1d	David Rankin																								
Staff Meeting 3	16-Nov	16-Nov	1d	Team																								
Wonder Factory Meeting 3	17-Nov	17-Nov	1d	Team																								
Final Report	31-Oct	25-Nov	26d	Team																								
Executive Summary	18-Nov	19-Nov	2d	Yongseok Park																								
Requirements	19-Nov	20-Nov	2d	Ali Alkhaiyat																								
Design Selected	20-Nov	21-Nov	2d	David Rankin																								
Design Description	21-Nov	22-Nov	2d	Juan Shields																								
Proposed Design	22-Nov	23-Nov	2d	Yongseok Park																								
Format	23-Nov	24-Nov	2d	Team																								
Updates	24-Nov	25-Nov	2d	Team																								
Final Presentation	26-Nov	30-Nov	1d	Team																								
Team Meeting Minutes Week 14	30-Nov	30-Nov	1d	Team																								
Team Meeting Minutes Week 15	5-Dec	5-Dec	1d	Team																								
Wonder Factory Meeting 4	6-Dec	6-Dec	1d	Team																								
Final Prototype	5-Dec	9-Dec	4d	Team																								

Budget

\$1,500 (Fundraising Optional)

Potential Expenses/Resources:

- Library 3D Printing rate \$0.10/gram
- Rushgears.com- purchase gears
- NAUMachine Shop

QUESTIONS?

THANK YOU!

References

[1] *The Wonder Factory* [Online]. Available: www.facebook.com/thewonderfactoryflagstaff