# STEM Display B Team 15

**Project Manager**
Ali Alkhaiyat

**Secretary & Client Contact**
David Rankin

**Budget Liaison**
Carlos Shields

**Website Developer**
Kevin Park

the
wonder
factory
an interactive
engineering and
science center

[1]

# Project Description



[1]

## The Wonder Factory

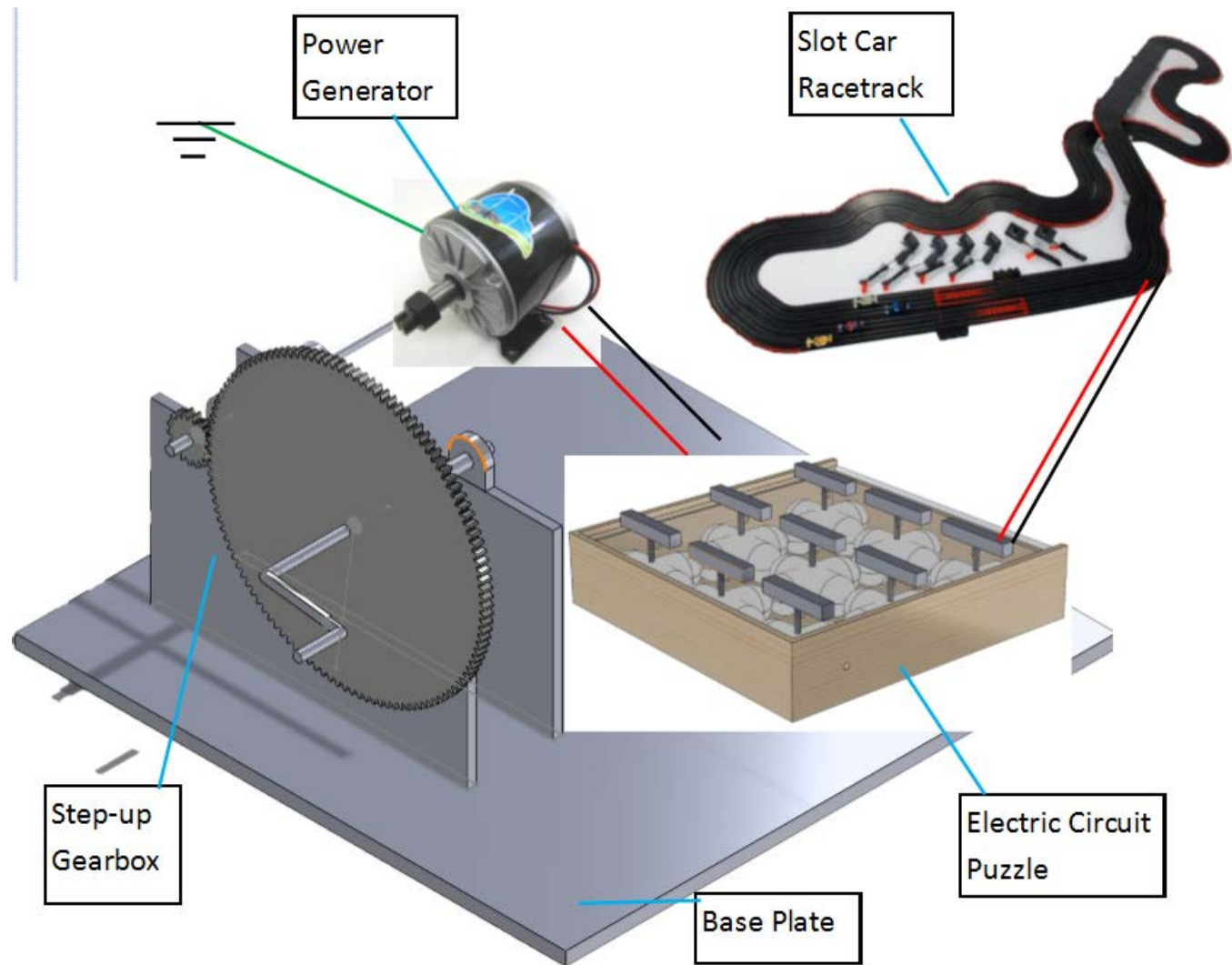Interactive center of Science, Technology, Engineering, Art, and Math (STEM/STEAM) in Flagstaff, AZ

# Project Description

-Must be safe to all users per applicable safety standards. Safety is our first priority!!

-Must be ready upon completion of this capstone sequence

-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 Description

## An Engineer's Pit Race

Power Generator

Slot Car Racetrack

Step-up Gearbox

Electric Circuit Puzzle

Base Plate

David Rankin 11/30/2016
The Wonder Factory STEM
Display B - Team 15

# Designs Description

- Counted down to start the competition

- Each station will read about how gears work, gear ratios for speed, and moment arms

- Users choose gears and crank arm and mount onto gearbox

- Users then solve the electric circuit puzzle to transfer power from generator to slot car racetrack

- While rotating gearbox, each team will race their slot car against the other stations!

# Design Requirements

## Customer Requirements:

- Portability
- Safety
- Multiple users capable
- Tactility

- Auditory
- Visibility
- Project into role
- Feel intelligent
- Simplicity

# Schedule – Gantt Chart

| | Start Date | End Date | Duration | Accountable | Week 13 | | | | Week 14 | | | | | | | | | | | Week 15 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 24-Nov | 25-Nov | 26-Nov | 27-Nov | 28-Nov | 29-Nov | 30-Nov | 1-Dec | 2-Dec | 3-Dec | 4-Dec | 5-Dec | 6-Dec | 7-Dec | 8-Dec | 9-Dec |
| **Final Presentation** | 24-Nov | 30-Nov | 7d | 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 | | | | | | | | | | | | | ▮ | | | |
| Staff Meeting 4 | 7-Dec | 7-Dec | 1d | Team | | | | | | | | | | | | | | ▮ | | |
| **Final Prototype** | 1-Dec | 9-Dec | 4d | Team | | | | | | | | ▮ | ▮ | ▮ | ▮ | ▮ | ▮ | ▮ | ▮ | ▮ |

| | Start Date | End Date | Duration | Accountable | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 | Week 7 | Week 8 | Week 9 | Week 10 | Week 11 | Week 12 | Week 13 | Week 14 | Week 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 16-Jan | 23-Jan | 30-Jan | 6-Feb | 13-Feb | 20-Feb | 27-Feb | 6-Mar | 20-Mar | 27-Mar | 3-Apr | 10-Apr | 17-Apr | 24-Apr | 1-May |
| Team Meetings Week 1 | 16-Jan | 16-Jan | 1d | Team | ▮ | | | | | | | | | | | | | | |
| Staff Meetings Week 2 | 23-Jan | 23-Jan | 1d | Team | | ▮ | | | | | | | | | | | | | |
| **Individual Post Mortem Week 2** | 23-Jan | 23-Jan | 1d | Team | | ▮ | | | | | | | | | | | | | |
| **Progress Presentations Week 3** | 30-Jan | 30-Jan | 1d | Team | | | ▮ | | | | | | | | | | | | |
| Team Meetings Week 4 | 6-Feb | 6-Feb | 1d | Team | | | | ▮ | | | | | | | | | | | |
| **Hardware Review 1 Week 5** | 13-Feb | 13-Feb | 1d | Team | | | | | ▮ | | | | | | | | | | |
| Staff Meetings Week 6 | 20-Feb | 20-Feb | 1d | Team | | | | | | ▮ | | | | | | | | | |
| Team Meetings Week 7 | 27-Feb | 27-Feb | 1d | Team | | | | | | | ▮ | | | | | | | | |
| **Midpoint Report Week 7** | 27-Feb | 27-Feb | 1d | Team | | | | | | | ▮ | | | | | | | | |
| **Midpoint Review Presentations Week 8** | 6-Mar | 6-Mar | 1d | Team | | | | | | | | ▮ | | | | | | | |
| **Hardware Review 2 Week 9** | 20-Mar | 20-Mar | 1d | Team | | | | | | | | | ▮ | | | | | | |
| Team Meetings Week 10 | 27-Mar | 27-Mar | 1d | Team | | | | | | | | | | ▮ | | | | | |
| Staff Meetings Week 11 | 3-Apr | 3-Apr | 1d | Team | | | | | | | | | | | ▮ | | | | |
| Draft of Poster Week 11 | 3-Apr | 3-Apr | 1d | Team | | | | | | | | | | | ▮ | | | | |
| Presentation walk-throughs Week 12 | 10-Apr | 10-Apr | 1d | Team | | | | | | | | | | | | ▮ | | | |
| **Final Poster Week 12** | 10-Apr | 10-Apr | 1d | Team | | | | | | | | | | | | ▮ | | | |
| **Final Product Testing Proof Week 13** | 17-Apr | 17-Apr | 1d | Team | | | | | | | | | | | | | ▮ | | |
| Draft of Operation/AssemblyManual Week 13 | 17-Apr | 17-Apr | 1d | Team | | | | | | | | | | | | | ▮ | | |
| **UGRADS presentations Week 14** | 24-Apr | 24-Apr | 1d | Team | | | | | | | | | | | | | | ▮ | |
| **Operation/AssemblyManual Week 14** | 24-Apr | 24-Apr | 1d | Team | | | | | | | | | | | | | | ▮ | |
| Team Meetings Week 15 | 1-May | 1-May | 1d | Team | | | | | | | | | | | | | | | ▮ |
| **Final Report Week 15** | 1-May | 1-May | 1d | Team | | | | | | | | | | | | | | | ▮ |

Juan Carlos Shields 11/30/2016 The Wonder Factory STEM Display B - Team 15

# Budget

$1,500 (Fundraising Optional)
Spent so far: $229.95 The track and $155.00 for 1 generator

Balance: 1270.05
Generator was bought out of pocket and we plan to charge our account in the future.

Expected expenses:
2 player: $1116.04
3 player: $1510.09
4 player: $1904.14

We may need to request additional expenses or do some fund raising if we plan to do the 4 player model. The 3 player and 2 player look feasible with our current budget.

# QUESTIONS?

# THANK YOU!
—

# References

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