



# The TOT Bot

By Trevor Ohmann, and Parker Taylor.

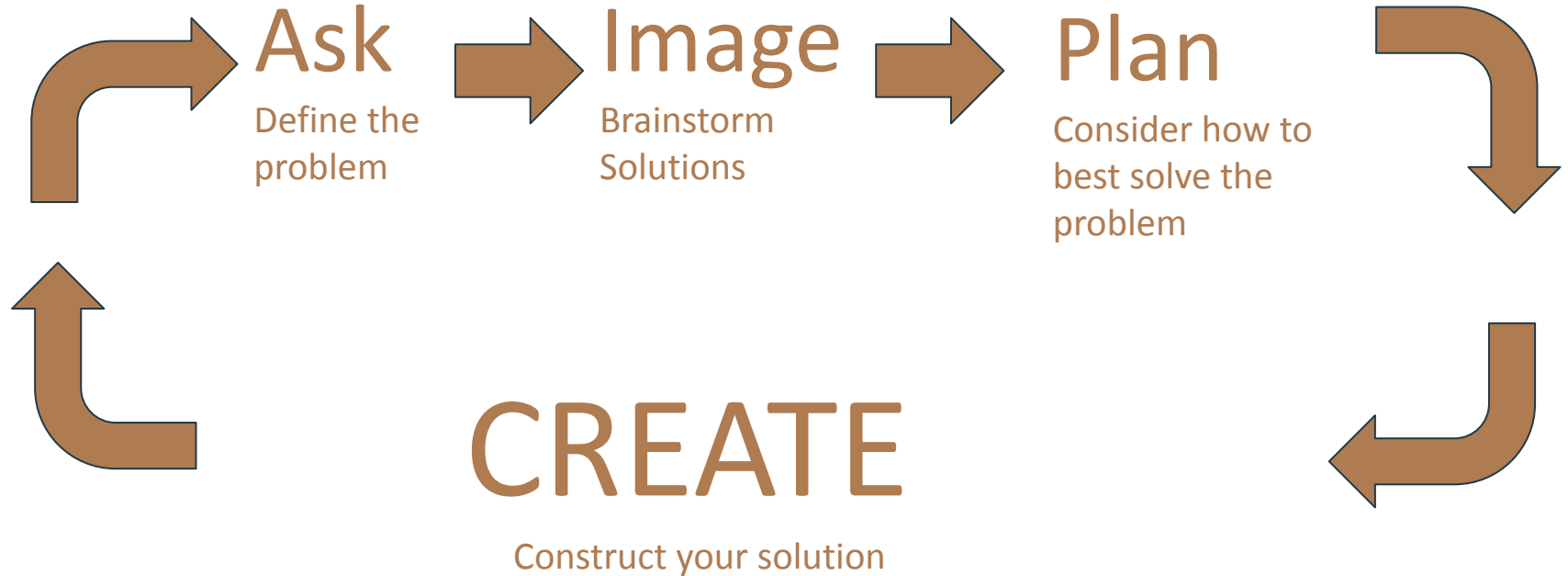


## Meet The Team

Team Leader-Parker Taylor

Build Planner-Trevor Ohmann

# The STEM Process



# The Story

A robot dresses up as a human, and he sees some children picking their noses. He thinks it is a normal thing, so he does it himself. He accidentally breaks his eyes, and they roll down his body. He gets so mad that he rips his head off. His phone gets pickpocketed, so he is so mad and kicks a door and breaks his toe. He then goes to an indoor playground, and he goes on the swings, but some kids are pushing all the swings, and then they knock him off the swing ending robots forever

# The Script

(Parker) I am Parker Taylor, the team leader.

(Trevor) I am Trevor Ohmann, the build planner.

(Parker) Our project is called the TOT Bot.

(Trevor) That stands for Transfer Of Technology.

(Parker) We decided to make our project a robot because we wanted it to be different from everyone else and stand out in the crowd. We faced many issues in our project like our slide deck deleting itself 2 weeks before the competition and the hinges not working how we wanted.

# The Script

(Trevor) As a build planner, I had to use the engineering design process to find solutions to these issues.

(Parker) Now for the project, our first step is when the marbles get pushed into the robot's head

(Trevor) The second step is when the marbles fall down the robots neck using gravity and knock a cup off a platform causing a potential to kinetic energy transfer.

(Trevor) The cup than falls using gravity and pulls on a latch opening it.

(Parker) The latch opening causes gravity to pull the arms down. We had many issues with this step and had to go through the STEM process many times to find the solution.

# The Script

(Trevor) The cup falling makes the string tension and pulls the phone out of the robots pocket.

(Parker) An opening is made and the marbles bounce off a deflector causing it to change velocity

(Trevor) The marble then rolls down a tube because of the gravitational force.

(Parker) The marble than exits the pipe and hits wooden blocks triggering a domino effect to happen.

# The Script

(Trevor) The ninth step is the wood blocks get knocked over making the swing fall due to gravity.

(Parker) The tenth step is the robot swinging on the swing set.

(Trevor) The final step is the robot falling off ending his robotic rampage for good.



# Supply List

1. 4 8 inch 1x2s
2. 2 23 inch 1x2s
3. Pair of shoes
4. 6 18 inch 1x2s
5. 2 12 inch 1x2s
6. 1 latch
7. 2 3 inch 1x2s
8. 1 4/4 plywood
9. 7 marbles
10. 5 cardboard boxes
11. 2 door hinges
12. 2 flashlights

# Supply List

13. 1 Pulley

14. 1 clear tube

15. 1 basket

16. 1 foot string

17. 20 Wood blocks

18. 7 pencils

19. 4 pencil erasers

20. 1 toy robot

21. 4 11 inch 1x2

22. 1 box of screws

# Costs

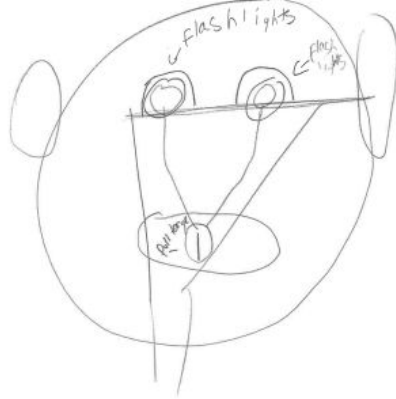
1. 2 Hinges - \$1.99
2. 1 Latch - \$1.99
3. 1 box of screws - \$7.99

Total Cost- \$11.97

94% of item reused

# First Drafts

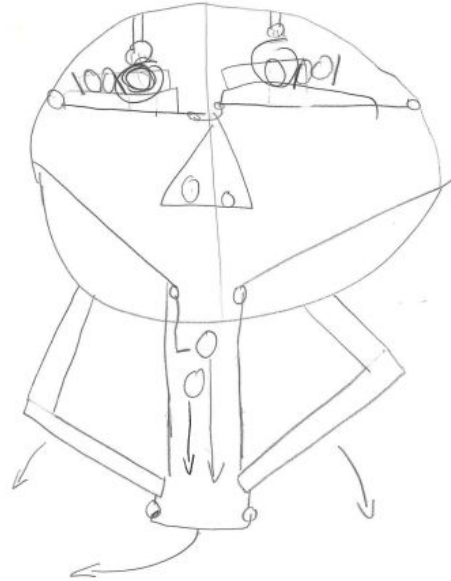
1st Step First draft  
Pull Ear marbles fall



we realized that the marbles would not fall at the same time causing later draft not work.

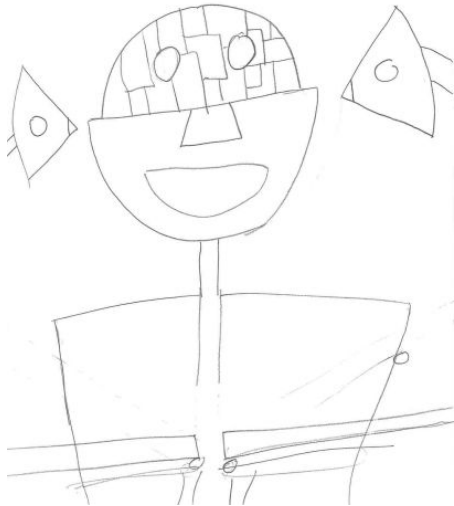
2nd Step  
marbles fall and  
open a latch

~~1st draft~~  
Final Draft

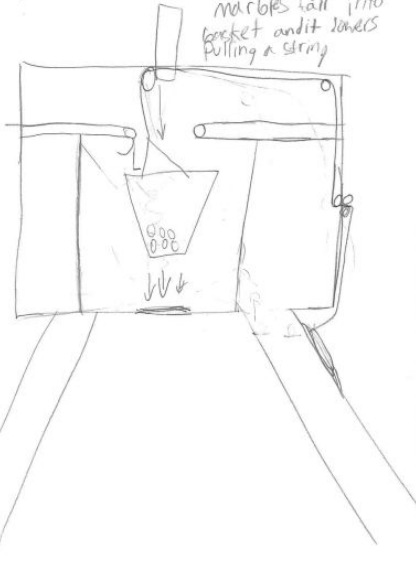


# First Drafts

3rd Step ~~1st~~ draft  
Arms drop opening final robot head



4th Step 1st draft/idea  
Marbles fall into basket and it lowers pulling a string



5th Step 2nd draft  
Phone gets pulled from pocket



6th Step  
Opening is made and marble bounces off detector



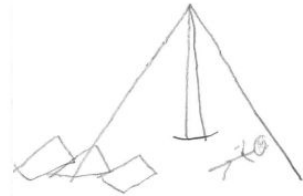
# First Drafts



4th Step  
Jenga blocks get knocked over  
making model robot swing  
on the swing set



10th Step  
robot falls off swing proving  
humans are better



## Main Frame

The Main Frame is used to house all the internal steps, just like a body houses the organs

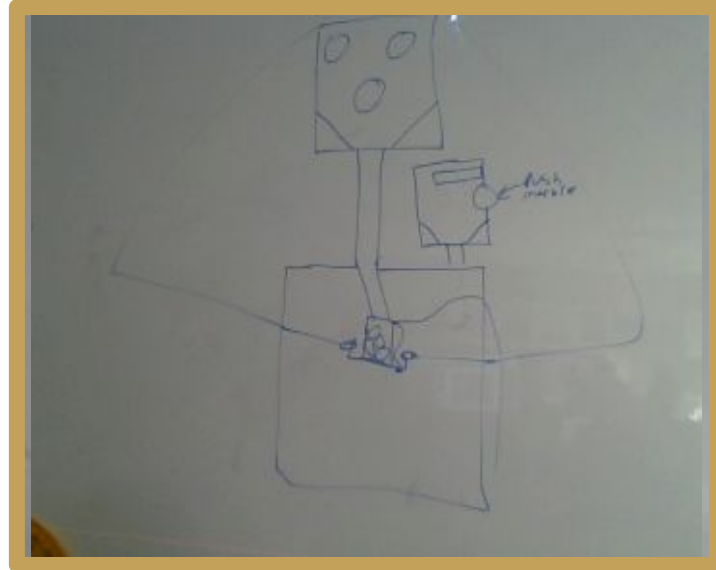
## Materials

8 18 inch 1x2's  
4 6 inch 1x2's

# Step One

# FINAL DESIGN

Someone pushes his nose  
and lets marbles run down  
his insides

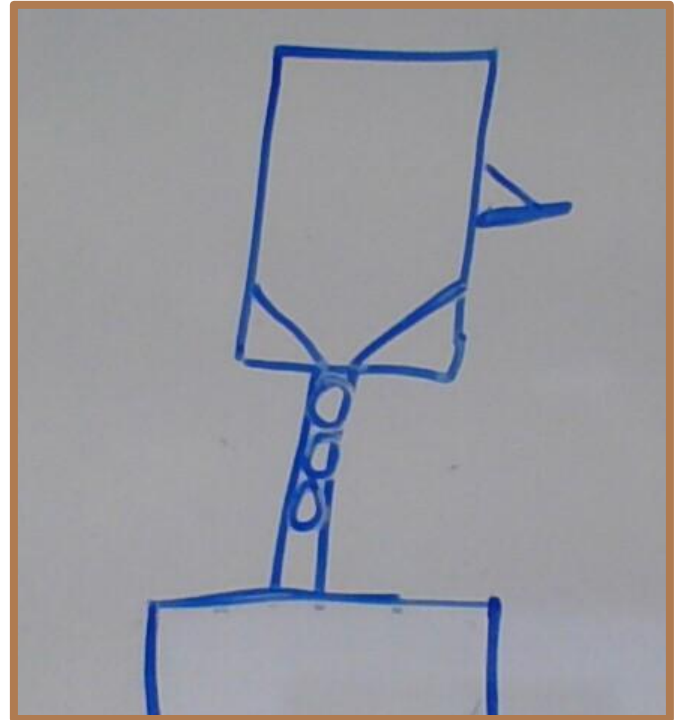




## Step Two

## FINAL DESIGN

The Marbles run down his neck because of gravity



## Step Three

## FINAL DESIGN

The cup falls and pulls on a latch opening the latch



## Step Four

## FINAL DESIGN

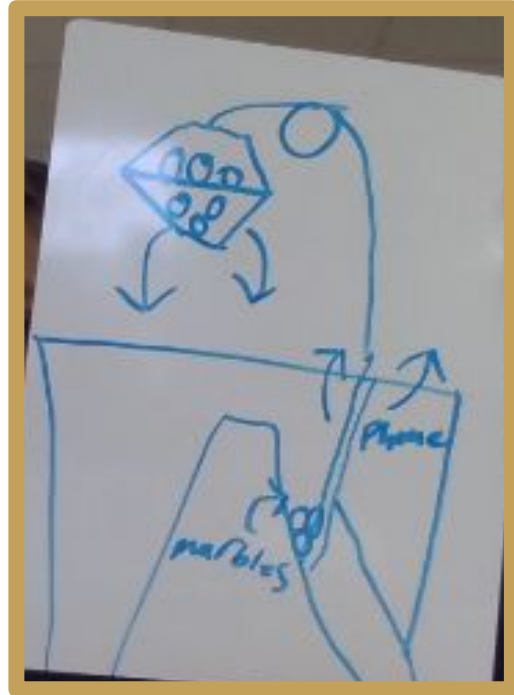
The arms than fall down  
causing the head to open



## Step Five

## FINAL DESIGN

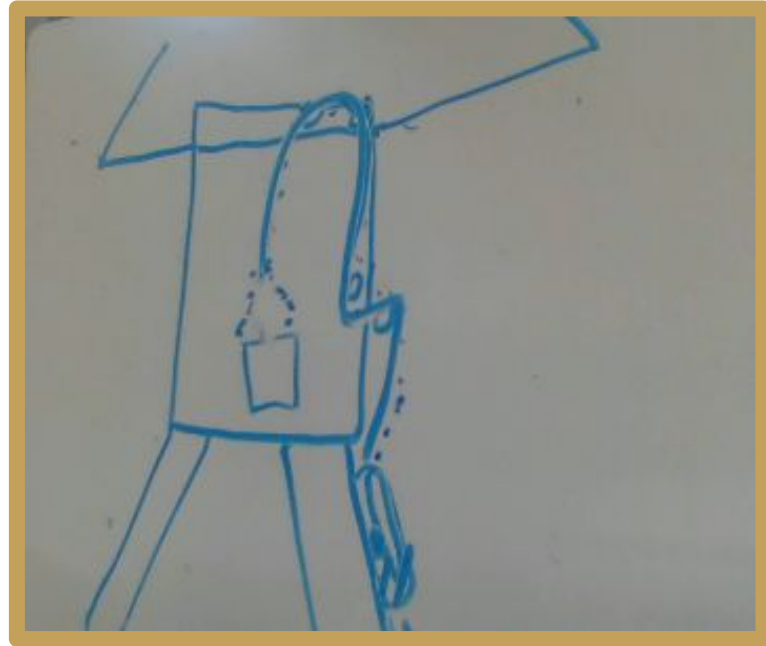
A phone gets pulled from his pocket.



## Step Six

## FINAL DESIGN

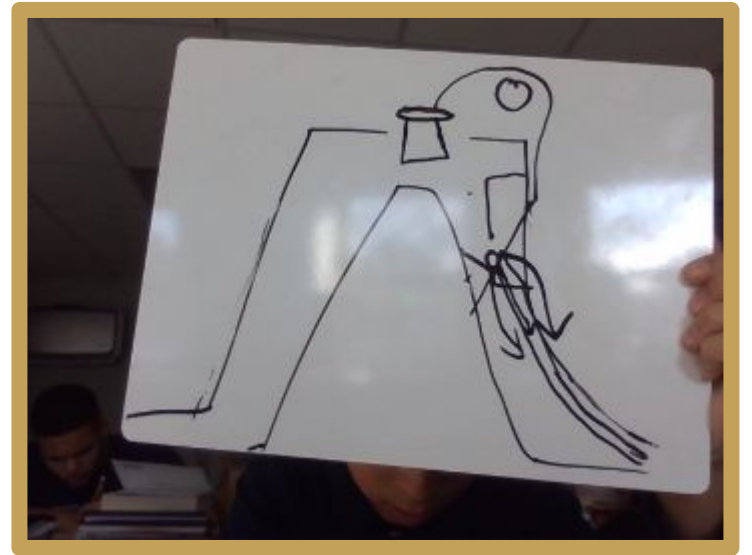
An opening is made and a marble bounces off a deflector.



## Step Seven

## FINAL DESIGN

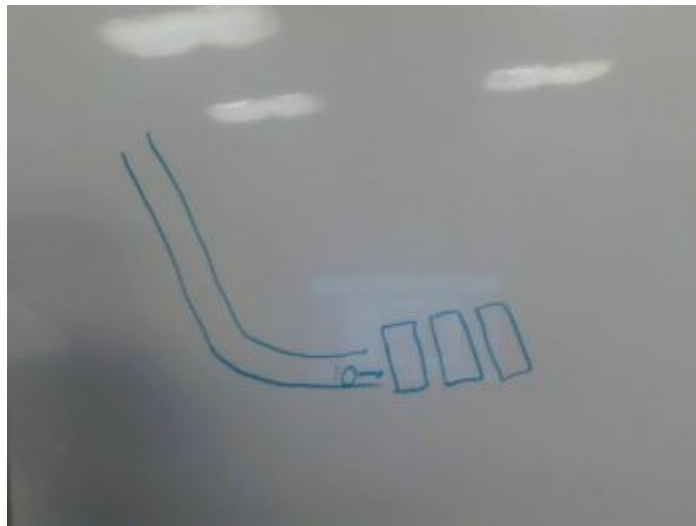
The marble roll down the leg through a cardboard pipe.



## Step Eight

## FINAL DESIGN

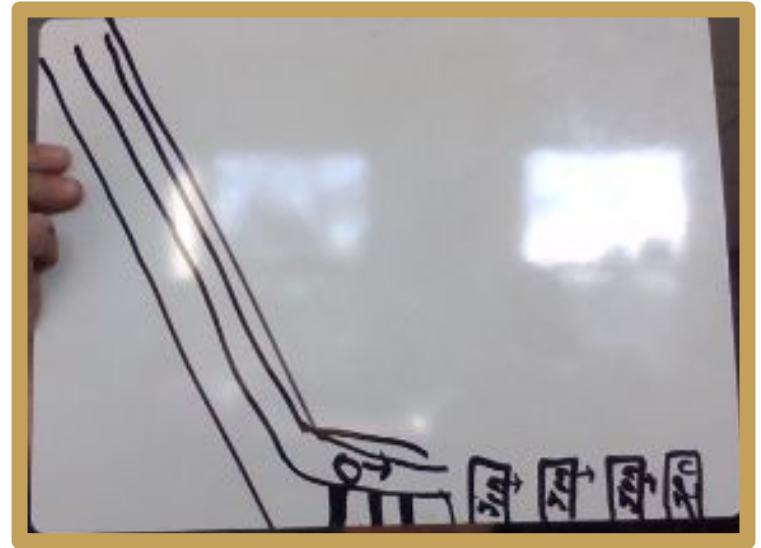
The marble hits wood blocks triggering a domino effect.



## Step Nine

## FINAL DESIGN

The wood blocks get knocked over making the robot swing on the swing set.

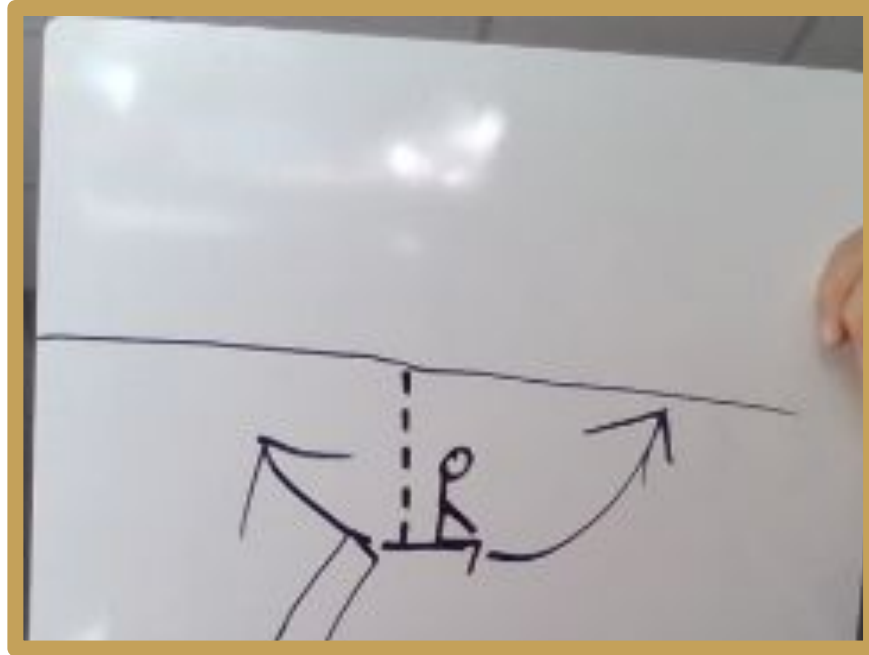




## Step Ten

## FINAL DESIGN

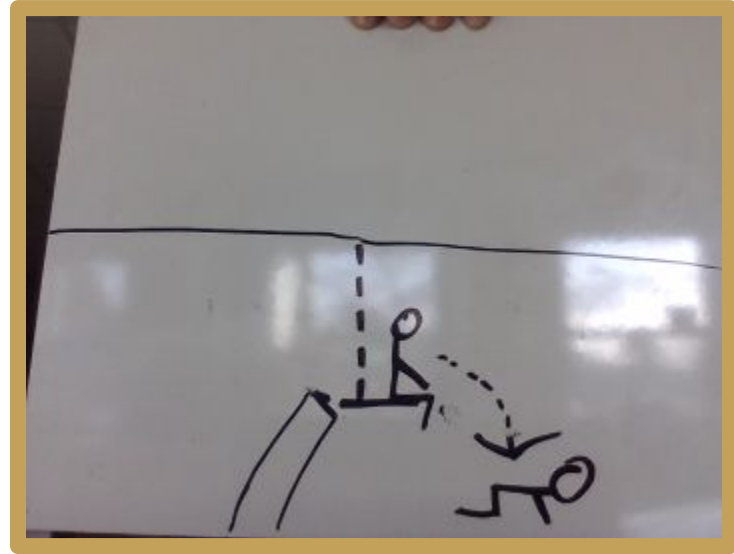
The swing swings



## Step Eleven

The robot falls off of the swing proving humans are better.

## FINAL DESIGN



# Problems

One problem we ran into was that we didn't have enough wood, so we shrunk the dimensions of the robot. We ended up needing more wood for the legs, so they would be in the middle. The first problem we had was that the arms did not sit right, so then we had to reposition the arms so they would fall in the right spot. One day our whole slide deck randomly deleted 2 weeks away from the competition, but thankfully we went back into the versions and got it back. Our slide deck then did it again, so we had to make a copy and use that instead. We also lost a teammate in the beginning of the year and a second after the regional competition. That left us with only one teammate for the championship round.

# Reflection

Parker- As the team leader, I think that we did very good this year. The first thing that I noticed is that we worked really well as a team. We also all pulled our weight, whether it was helping with the slides, making the head for the project, or stacking up wood blocks so that we could practice the run. The next thing that I noticed that was different from last year was we all had an idea, and we sat down and listed to each one, even if we didn't think it would work we still tried or listed to them. I also think that we made our project a lot simpler than last year and, it is a lot cleaner. Since it was simple, we had more time to make sure the project works every time. I think that the smaller group also made it easier to communicate the problems and ideas we had about a certain thing on the project.

Trevor- As a Build Planner, I think we did a good job using the engineering design process, prototyping our robot and fixing things that didn't work well. Last year, our project needed much luck on our sides, and we did not get that luck when we needed it. This year we decided to make our project much simpler, but still cooler than last year. Many of our plans worked as we wanted, but at the same time some of them didn't. I am excited to see if our project works at the competition and if our ideas will bring us to the championship this year! After the first competition we realized that we needed to do some work on our slides to get those extra points we needed for the Championship.

# Bibliography

[www.homedepot.com](http://www.homedepot.com) - We used this website to find products that we needed to build our project

<https://www.menards.com> - We used this website to find products that we needed to build our project

[www.lowes.com](http://www.lowes.com) - We used this website to find products that we needed to build our project

[www.harborfreight.com](http://www.harborfreight.com) - We used this website to find products that we needed to build our project