

FIRST LEGO League

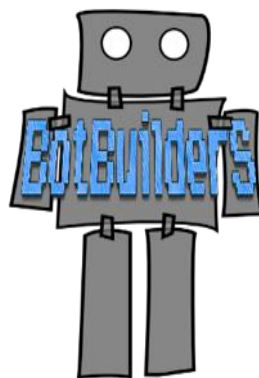
2017

Hydro-Dynamics



BotBuilders

Team Journal



Jackson, Andrew, Joe, William and Ayzlin

22/08/17
Week 1

Joe: We found out who was in our group. Daniel told us of a good place to find robot tutorials. We also have established that we will put three turtles, four crocodiles, one alligator, one seastar, four crabs, two lobsters, 'some' fish, one shark, one mantaray, one octopus & a Killer Croc on the robot. We also found out some facts, tips and the mechanisms. It will take more than one attachment. All of our things are water based.

Ayzlin: Today we looked at our mission table and established our teams. The competition is based on water this year. We also looked at the different types of missions we might need to complete and what kind of attachments we might use to complete them. We also thought about what kind of robot base we can use (for example a box type robot) to be able to easily remove and place attachments on. In two weeks we will find out what the real missions are. We will also start building our robot in the next few weeks. I think we will have a great learning experience building and coding our robot.

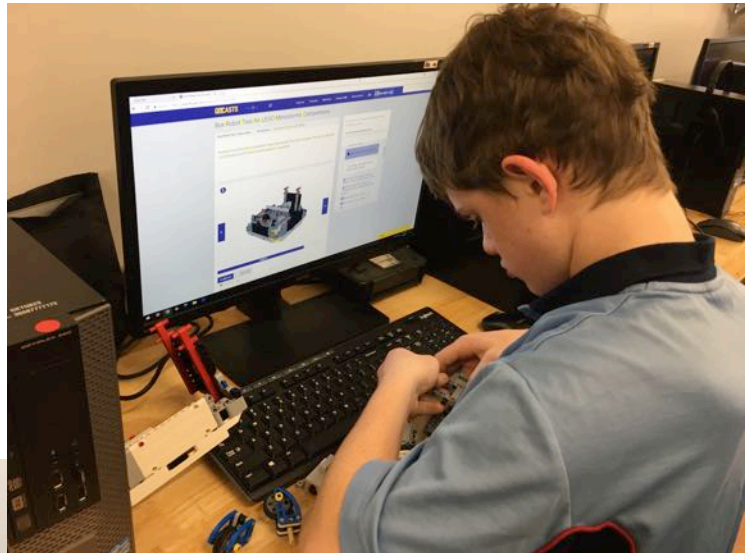


29/08/17
Week 2

Joe: Andrew started working on the Box Robot. I made the logo. We met Jackson, our new team captain. We looked over the missions. The logo is a robot with pixelated text over it saying BotBuilderS. Attempted to fix the toilet mission.

Jackson: Today was my first meeting with the team. Due to being absent from the first meeting. I was informed that I was group leader and was introduced to the rest of my team. Andrew and William I know from last year and I was introduced to Joe and Ayzlin. Today I started by inspecting the table and inferring what the missions would most likely be like. Then Andrew and I started to construct the team bot. While Will and Joe conferred over the team logo.

Andrew: Today Jackson and I started working on the robot. We have decided to go with a box robot and to make pin-less attachments to save time. We also found one of the mission builds was not working properly





05/09/17

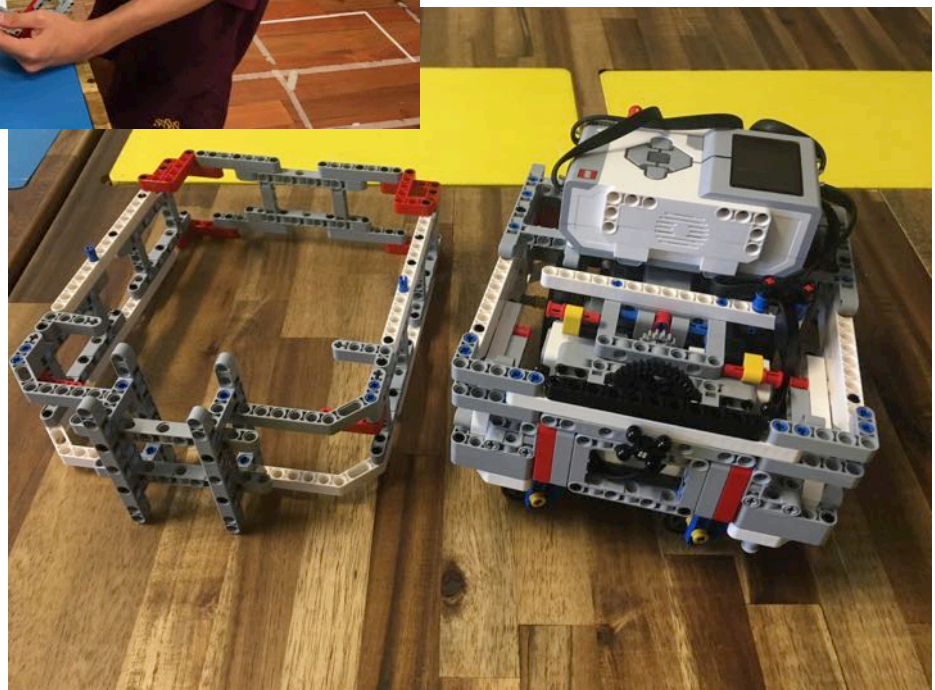
Week 3

Jackson – Today our team mentors and I had a discussion about adding a sixth team-member to the BotBuilderS. I thought it was a great idea as it would let everyone have a turn at running the bot course while allowing for more workload spread over the team as well as providing a greater team oriented dynamic. Then we watched the FLL information video on the bot course and the research project as a team. Afterwords Andrew and I resumed construction on the bot, while the other team members started to de-construct the missions into groups that could be completed easily at the same time.

William – sequentially analysing each mission to determine the appropriate attachments for our robot and we grouped the missions into categories. We still have 8 missions left to analyse

Joe – Today we had a discussion about the individual missions and strategies. I worked on the frame for the robot and almost finished it. Lucky sixth.

Andrew – Today I finished building the robot. I had to modify our robot from the instructions because we wanted to use the large wheels to get over the ramp and they wouldn't fit using the same instructions so I had to make the robot slightly longer. Jackson helped me attach the cords but I had to modify the front of the robot to plug the large motor cables in.





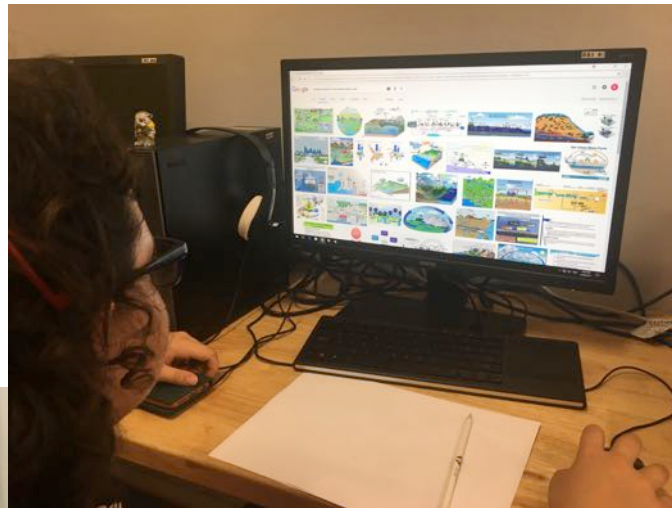
12/09/17
Week 4

William- Today we finished the analysis of the missions and the attachments required. We came together as a team and identified potential ways to build and improve attachments. We examined 2 different ways of building a grabber attachment. Both models utilise motors but we think 1 is more accurate. The next thing we will be doing is to design and build 2 prototypes.

Jackson (team leader)- Firstly we had a team conference about the goals that would need to be accomplished this team practice. We identified several key areas that needed work. The first goal set was to start the research project. The second to fix the team robots cords to allow for ease when putting on attachments. The last two areas identified were to finish the analysing the mission.

Joe- Today I finally finished the frame for the robot after many sore fingers. Andrew worked on attachments. We had a team conference. We worked on the research project. We also established that no one likes writing

Ayzlin- today I worked on the team research project, one of the interesting facts I found out:
97% of the world's water is salty or undrinkable
2% is locked in icecaps or glaciers
1% is for residential, manufacturing, community, and personal needs. I also worked on a program with Daniel that will help us program and use our robot.



03/10/17 04\10\17 05\10\17
Week 5

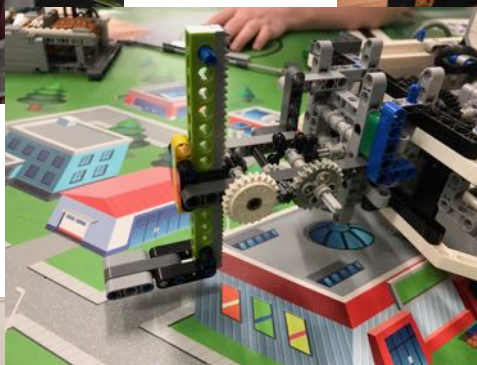
Joe: We discussed two problems with the missions. One was how we could unleash the rain drops and how we can pick them up. Andrew made a bucket that fits perfectly. However, we have no idea how we are going to let the rain fall. The second issue was how to turn the handle on the pump. We could use the current attachment that raises and lowers a platform and lower it down onto a side of the handle or create a new attachment.

Andrew: over the holidays I built a forklift attachment and relocated the light sensors and I also added a gyro to help it re-align. Today we discussed a couple of problems with some of the missions. I made the bucket to collect the rain drops.

04\10\17

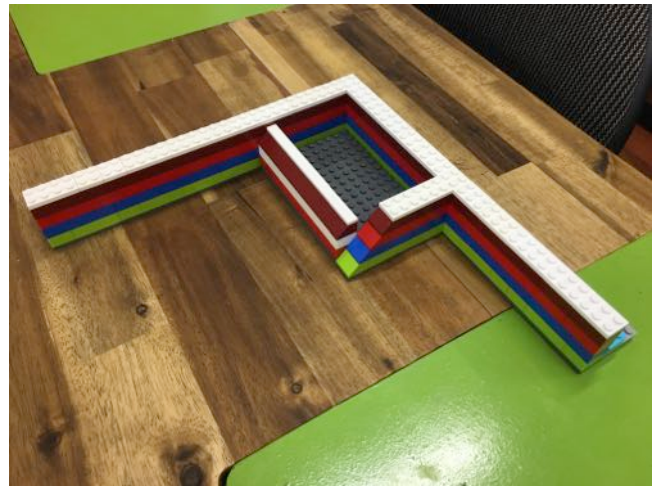
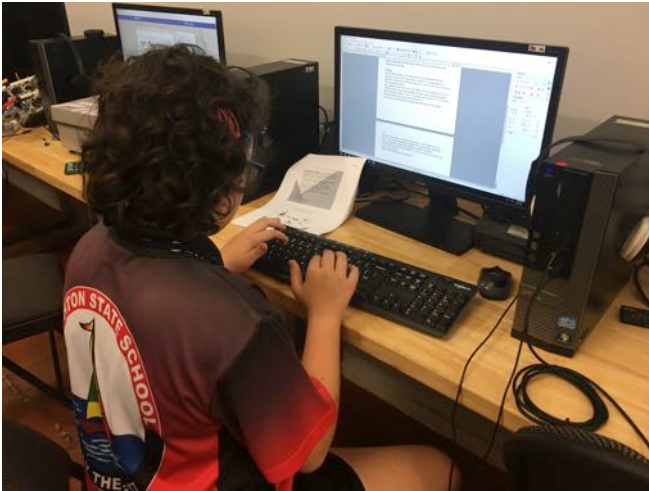
William: Today I started on the code of my missions but I didn't get much done because of the caster wheels being at the front of the robot. We were of using ski type caster wheels or we could change the placement of the caster wheels.

Ayzlin: On Tuesday I worked on the poster and our speeches for the competition. Our poster is about the core values: Integration, Discovery, Inclusion and coopertition. Jackson and I worked on the speeches together and they are almost done. After we are finished writing them we will move on to practicing them and then shortening to fit in our time limit of 5 minutes.



10/10/2017
Week 6

Joe: today I made a starting frame out of LEGO so that we can start the robot in it. This way we know where to start every time. Jackson and Ayzlin continued working on the speeches for the research presentation.



17/10/2017
Week 7

Jackson: Today we built a jig to assist in the positioning of the bot within the safe zone. Then we began the core values poster as well as finishing off the speeches and code from last week.

William: today we started on the core values poster and I had to start on fixing my code by replacing the gyro the reason is because there was a lot of room for error

Joe: I extended the LEGO starting frame so that it could be used for the mission that William is coding (the pipe addition)



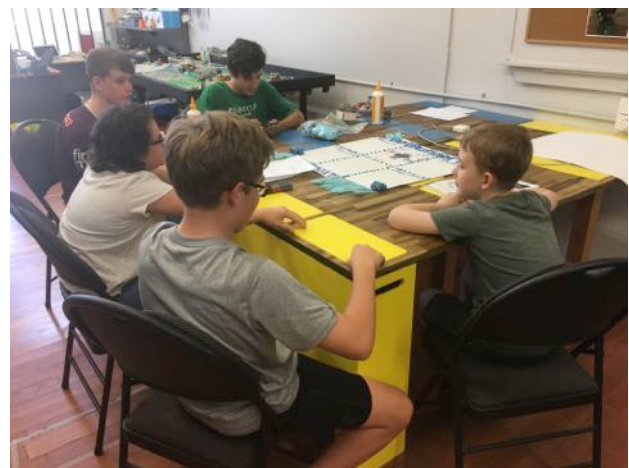
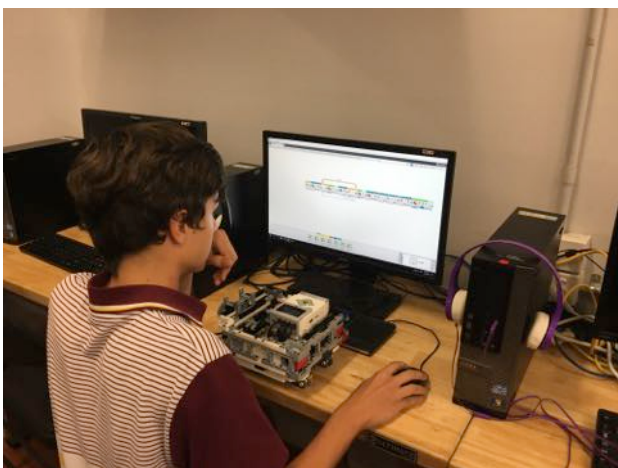
Week 8
24/10/2017

Jackson: Today I started the production of questions to ask our professional. I also continued to improve my code for my mission completing the drop off of the well. Ayzlin continued to work on the poster for the core values of FFL while Joe started to code his mission as well as constructing a ladder attachment.

Andrew: Added a bucket to the jig to hold items for the missions and I also helped Jackson with the questions. I helped Joe make two attachments to help him with his mission but the first attachment was unable to be used because there was too much friction.

Joe: Today I built and coded a contraption which picks up the replacement pipe and drops it into place using gears. I will also be doing the fire truck so straight after the pipe replacement the robot will drive over the toilet pipe (we are not doing that mission) and go straight to the truck instead of going all the way round. Ayzlin worked on the poster (it's looking great!) and Andrew, Will and Jackson helped on the attachment and storage jig.

Ayzlin: today I worked on the poster and made it more appealing. I'm hoping to finish the decorating aspect of the poster next week and start on the writing. Jackson and William worked on the questions for the professionals that we will hopefully be contacting next week.



Week 9

31/10/17 - 4/11/17

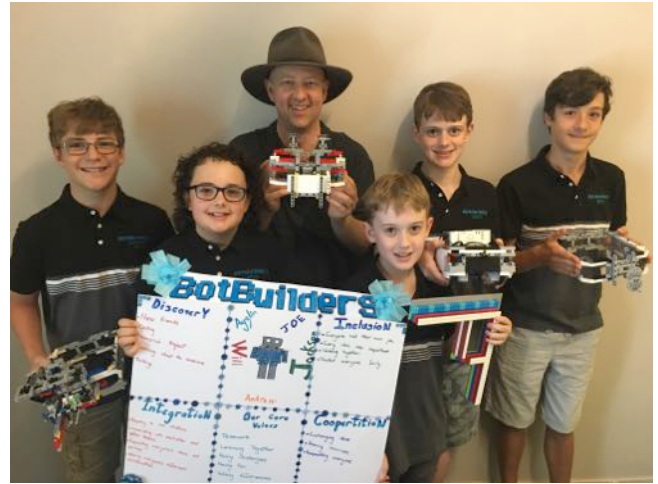
Joe: Today we all had a team meeting and finally sorted out the categories of the poster. I fixed up my code and added the team logo to the start and end of the main program. Ayzlin worked on the poster. Will and Jackson also worked on their own missions. Andrew read through the research and speech. I also extended the jig to include William's starting position. Also, happy Halloween! >:3

Andrew: Jackson worked on his mission and was able to deliver the well and was all most able to deliver the slingshot. I read over the research project and my part of the speech. On Saturday we practised our speeches and named our robot Robo Buttercup. I made a care package full of spare pieces for the robot on competition day. At 12:30 pm we had a team photo wearing our team shirts. Jackson also made me the vice-captain. I also helped Jackson with his mission.

Ayzlin: Today I finished our core values poster and also finished the speeches, next week we will print the speeches out and practise them, this will give us the opportunity to finish coding and then start practising in full both the research project speeches and the mission run.

William: Today I kept working on the mission rain and improving on it since the gyro was removed . We also continued to do the core values poster with coopertition and inclusion. We also did the teams core values. Also, our team shirts arrived on Friday! They are really cool.





Week 10 7/11/17

Joe: Today, me (Joe), Andrew and Will practised the speech and I finally had a look at the model. Oops. We all contributed to find out the best order for the missions. Jackson and Andrew fixed one of the attachments. We test ran all of our missions in the main program. We found out that we need to improve on timing and pressing the correct buttons. We still have a lot of practice to go.

Ayzlin: Today I cut out the final copy of our speeches and they will be laminated for Sunday. I then spent the rest of the afternoon watching the runs of the missions, as I might be doing run 3. we still have a lot of practise to do before Sunday. We also sorted out the order of the runs.

William: Today we practised on the robot missions and the speeches we also chose the teams on the robot runs 1 team is Andrew and Joe, then Jackson and Ayzlin, then Jackson and me. We also changed the order of the missions on the master program.



BotBuilders interview questions to Unity Water and Queensland Urban Utilities:

- 1) Do you think that the combining the technology of Oakley Meatworks and Greengrove Effluent Irrigation Facility could create an efficient model for use of waste water?
- 2) Would existing power generators from Anerobic digestion be enough to power the water waste treatment plants?
- 3) Do you think our new waste water proposal will be effective?
- 4) We have listed what we feel are the advantages and disadvantages of our proposed solution on the last two slides. Do you think that these are accurate?
- 5) Can you think of any potential issues with our proposal?
- 6) How difficult do you think our proposal would be to implement?
- 7) Is there any part in our solution that you would alter to increase its potential effectiveness?
- 8) Do you think our proposed model would work at your treatment plants?
- 9) Do you think that our model could eventually make a difference to the way that we as a country look at and use water?

Thank you so much to your staff for assisting us in answering these questions.

2017 BotBuilders FLL Robotics Team: Jackson, Andrew, Joe, William and Ayzlin

Unfortunately we did not hear back from these statutory authorities. We were however told that an engineer by the name of George was looking at it at Unity Water. We did not hear back from him in time.

Email sent to Oakey Meatworks (info@nh-foods.com.au):

On Mon, Oct 23, 2017 at 11:10 PM, Rebecca Pollard <rebecca@buildingblockstudio.com> wrote:

Hi there,

I was wondering if you could help me. I coach a team of 5 students who are participating in a robotics competition: FIRST LEGO League. Each year the theme is different. This year's theme is "Hydro Dynamics". The competition requires the students to write code for robots to complete specific challenges around a themed mission table and this year they must also research a real world problem and potential solution relating to the human water cycle.

The research they have conducted thus far has lead them to a suggestion of combining technologies that enable a greater use of waste water and effluent as irrigation for agricultural areas once treated used by the Greengrove Effluent Irrigation Facility as well as the way that Oakey Meatworks use CST Wastewater solutions to take waste water from the processing floor and use it to partly power its own plant. They are a great bunch of students who think you and your staff are doing a great job at Oakey Meatworks. So, I was wondering if you would please be interested in allowing the students to interview you on the topic of their research and then after they do further research, maybe they can present their final research and solution back to you? This would be greatly appreciated!!

Please find attached a powerpoint presentation that they have prepared. This covers their research. They have also come up with a list of questions that they would like answered.

The students are unable to come to you, and we do not expect you to come to us. What we are hoping for, is to conduct the interview via phone call at 4pm on Tuesday 31st October 2017 or via email.

Once this is done and they have received your answers they will video record their final solution as a presentation and will send you the link so that they can share it with you.

If you could please forward this email on to someone at your facility who is able to help me with this. I know the students would love to talk to you someone at Oakey Meatworks.

Kindest regards,
Rebecca

Similar email sent to Greengrove Effluent Facility on Monday 23rd October.

Unfortunately, we did not hear back from either of these corporations.

Order of Missions:

Run #1: Fountain

TOTAL possible points:	60 points
- Fountain	20 points
- Tripod	15-20 points
- Broken pipe	20 points

Run #2: Rain

TOTAL possible points:	70 points
- Pump addition	20 points
- Rain	20 points
- Filter	30 points

Run #3: Tap

TOTAL possible points:	70 points
- Water well	12-25 points
- Slingshot	20 points
- Faucet	25 points

If time permits / Backup missions:

Run #4:

TOTAL possible points:	20 points
- Pipe replacement	20 points

Run #5:

TOTAL possible points:	25 points
- Flow (shared)	25 points

Order of robot game:

Robot Game #1: Andrew and Joe

Robot Game #2: Jackson and Ayzlin

Robot Game #3: Jackson and William