

Engineering Division

ENGINEERING NOTEBOOK

RES Rock and Roll Rockets
10676-B



Engineering

Notebook



Table of Contents

| | <u>Page</u> | |
|--|--|-------|
| 1. Meet the Team | 1-2 | |
| 2. Section 1: Meeting and Build Notes | | |
| Meeting Date | Topic | |
| 7.11.15 | 1st Meeting / Design | 3-17 |
| 7.19.15 | STEM Research and Build | 18-20 |
| 8.15.15 | STEM Topic Selection / Build | 21-22 |
| 8.28.15 | Build | 23-24 |
| 9.4.15 | Build | 25-26 |
| 9.11.15 | Build | 27-28 |
| 9.18.15 | Build | 29-30 |
| 10.9.15 | Build | 31-32 |
| 11.6.15 | Build / STEM Research | 33-34 |
| 11.13.15 | Test / Modify / Build | 35-36 |
| | Snapper is Done! | 37-38 |
| 11.20.15 | Rebuild | 39-40 |
| 11.25.15 | Build / STEM Research | 41-42 |
| 11.27.15 | Build / STEM Research | 43-44 |
| | Snapper Version 2.0 Summary | 45 |
| 12.4.15 | Build | 47-48 |
| 12.6.15 | Build | 49-50 |
| 12.11.15 | Build | 51-52 |
| | Snapper Version 3.0 Summary | 53-54 |
| 12.29.15 | Practice / Test / Rebuild | 55-56 |
| 12.30.15 | Build | 57-58 |
| | Snapper Version 4.0 Summary | 59-60 |
| 1.2.16 | Practice / STEM Research | 61-62 |
| 1.8.16 | STEM | 63-64 |
| 1.10.16 -1.16.16 | Practice STEM and Driving | 65-66 |
| 3. Section 2: Programming (January 1 -12, 2016) | | |
| Teleop program | version 1: Snapper Controller (60%) | 67 |
| Teleop program | version 2: Snapper Controller (75%) | 69 |
| Teleop program | *Snapper Controller (50% & 90%) Multi Driver | 71 |
| Autonomous Program | configuring motors and sensors | 73-76 |
| Gyro Help | Mr. Skinner sent help for Gyro Questions | 77 |
| Autonomous Program | Ramp Only | 79 |
| STEM Research | Jeopardy Game Controllers | 81-82 |
| Super Snapper | Super Secret Program for worlds | 83-84 |

4. Section 3: Our First Competition

| | | |
|--------------------|---|---------|
| Team Experiences | What we thought about our first competition | 85-93 |
| Pictures | competition day | 95-98 |
| Lessons Learned | Problems we had and solutions before States | 99-100 |
| Teleop program | New Snapper Controller Program | 101 |
| Teleop program | New 50% Snapper Controller | 103 |
| Teleop program | New 90% Snapper Controller | 105 |
| Autonomous program | SUPER NEW* Double Super Snapper | 107-108 |
| STEM Research | New Jeopardy Game program | 109-110 |

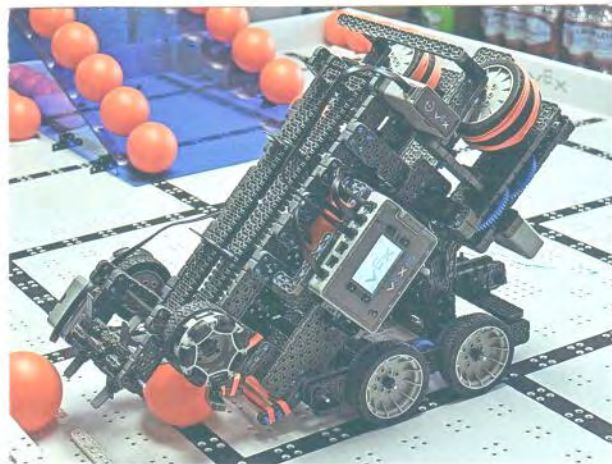
5. Section 4: State Competition

| | | |
|------------------|--|---------|
| Team Experiences | What we thought about State competition | 111-120 |
| Lessons Learned | Problems and solutions before we go to Worlds | 121-124 |
| STEM Research | Certificate we got from SMRWA Board of Directors | 125-126 |
| Pictures | STEM Research presentation | 127-128 |
| Pictures | STEM Field Trip photos | 129-130 |

Meet the team



10676B



snapper



Ashlynn



Grace

Dabe



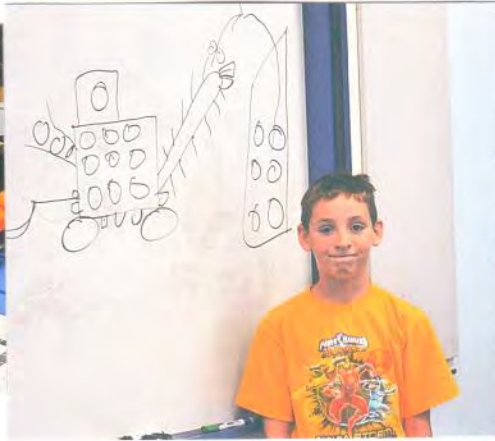
Connor



Destiny



Luis



save spot
for if we
ever get a
picture of
Luis smiling! @

Date: 7/14/15

Meeting Type: Group / Individual

Members Present: Ethan, Gabe, Kevin, Grace, and Connor

Meeting Topic: Robot Idea

Today's Goal: To have a idea for our robot.

Problems / Solutions / Comments:

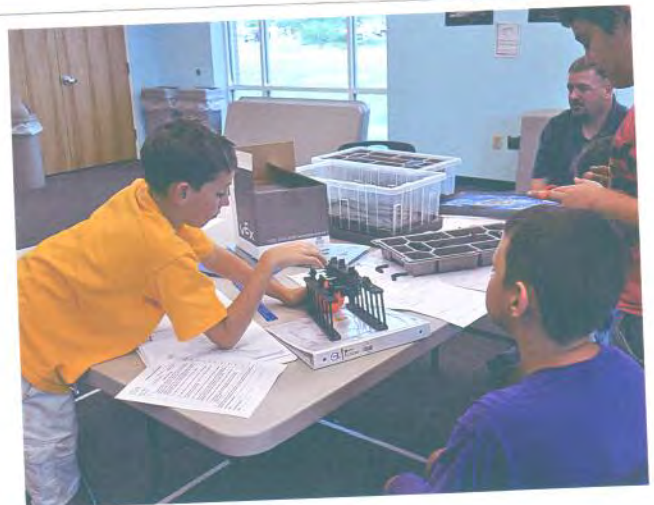
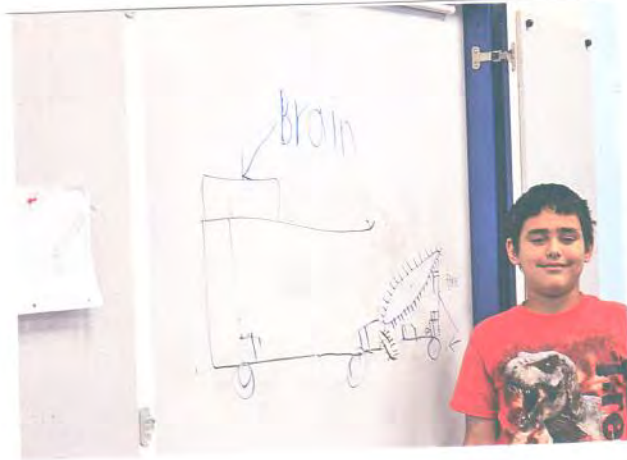
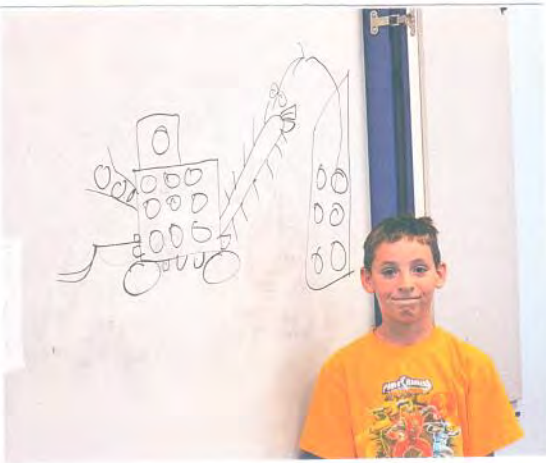
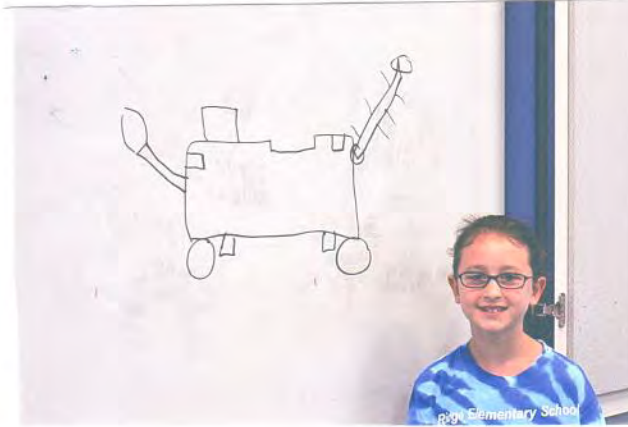
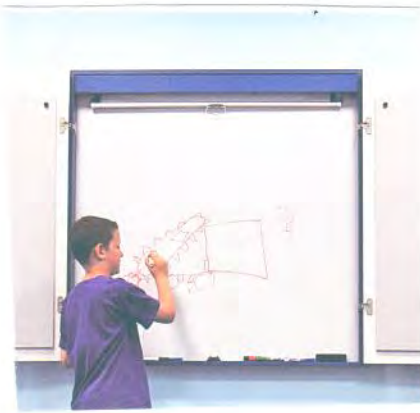
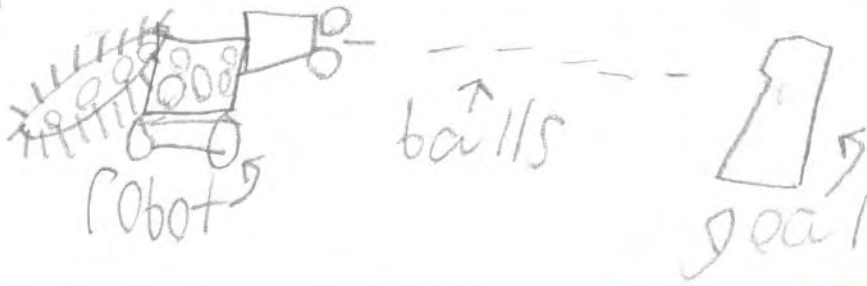
The problems were deciding whether or not we would use a claw, or use a conveyor belt. ^{over} We came to an agreement. We decided to use a conveyor belt.

Plan for next meeting:

Start Building the Robot and modify the conveyor Belt

Next Meeting: 7/19/15 Entry by: Gabe and Grace.

The conveyor belt will carry balls to the basket and the shooter will shoot the balls into the goal.



7.11.15 design ideas

Jason's idea is to make a ramp that leads into a basket and then they go into a ball shooter that leads to a goal.

Isaiah's idea is to suck up the balls and shoot them out with spinning wheels.

Jiler has an idea to use treaders and make a catapult that throws the balls into the goal and scoring zone.

Ethan's idea is to have a basket that picks up balls and then the balls go up a long shaft so the balls get speed and go on a conveyor belt and get shot off.

Gabe

Graces Idea was to use a claw that picks up 3 at a time and puts them into a basket then there is a conveyor belt that shoots balls into the goal

Connor's idea is to use a conveyor belt with wheels at the end to shoot balls into the goal, the basket has tunnel that picks balls up and into the basket.

Louis had an idea to use 3 wheels and 2 conveyor belts to shoot balls into the goal.

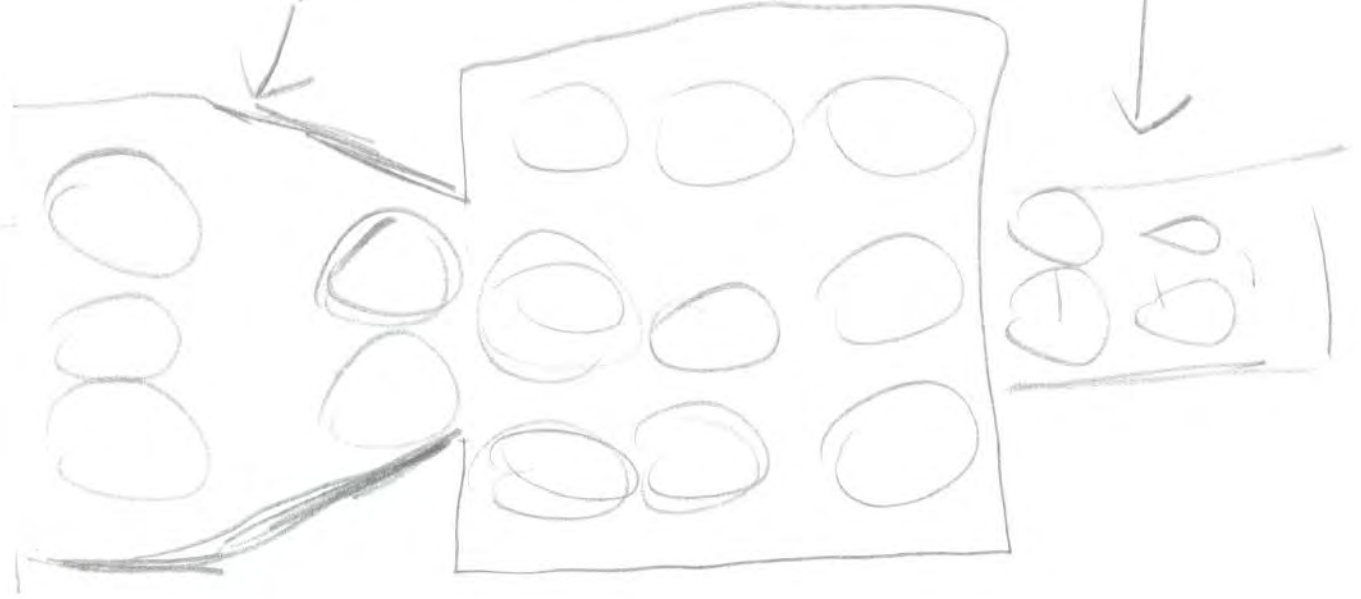
Eli used 2 wheels to shoot balls into the goal

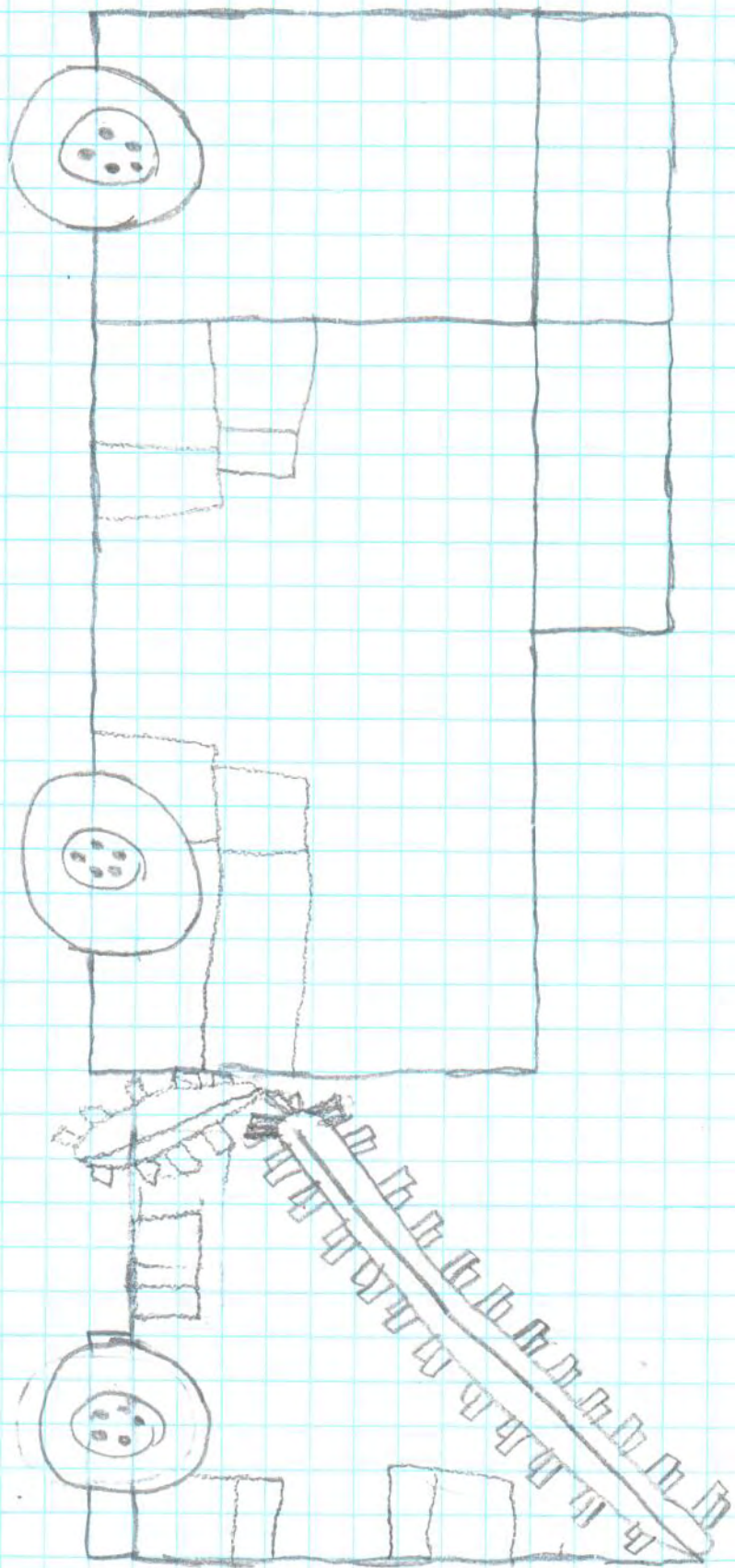
(CANNON 7)

②

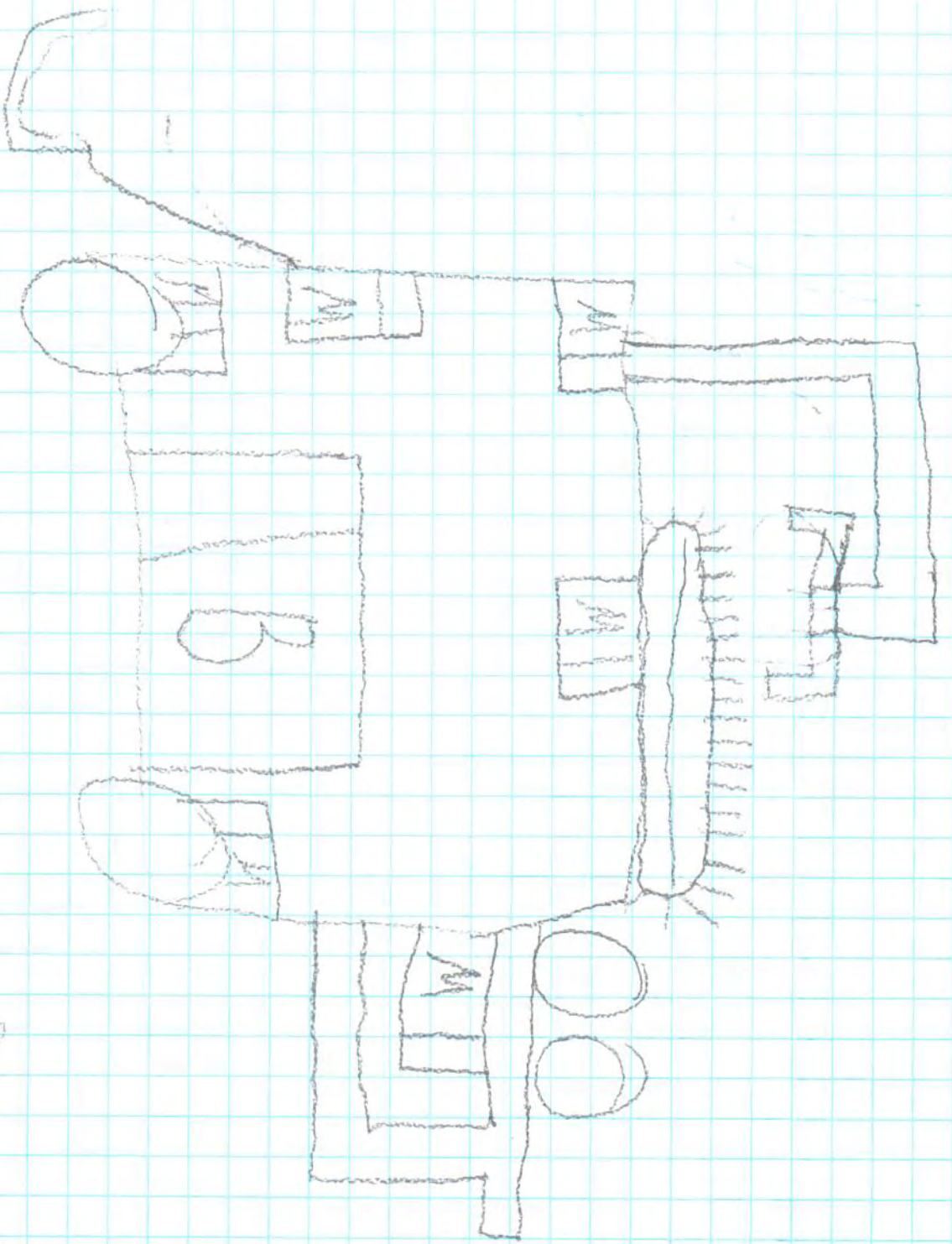
fund (trug)

buffer





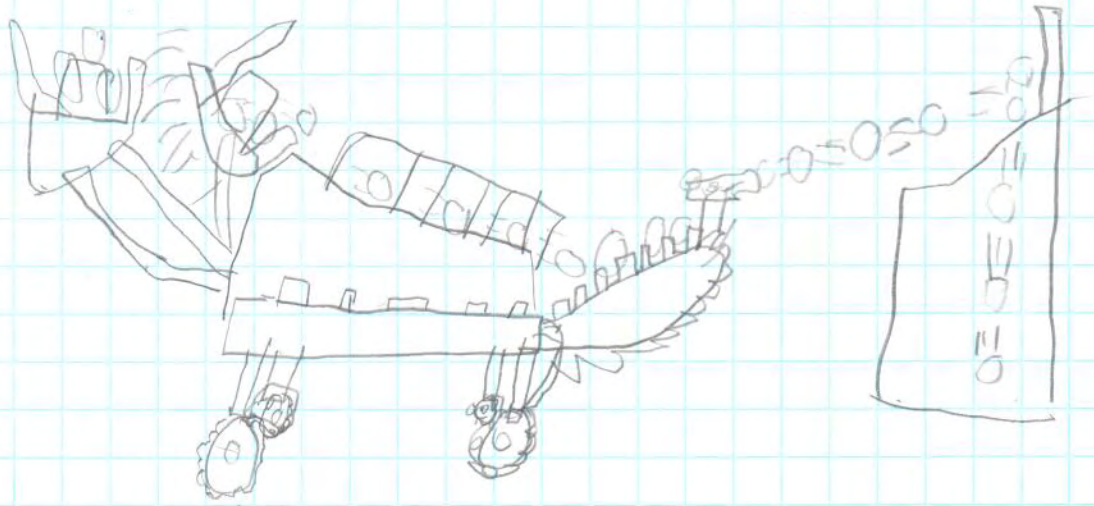
LMS



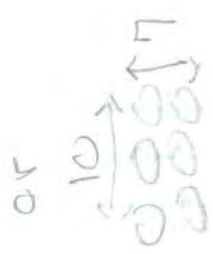
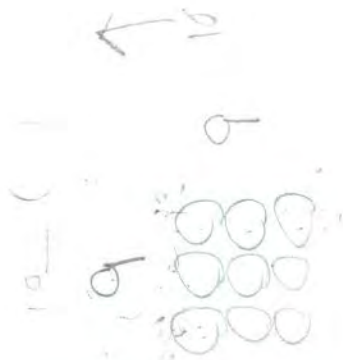
U's

B's for Brain
M's for Motor

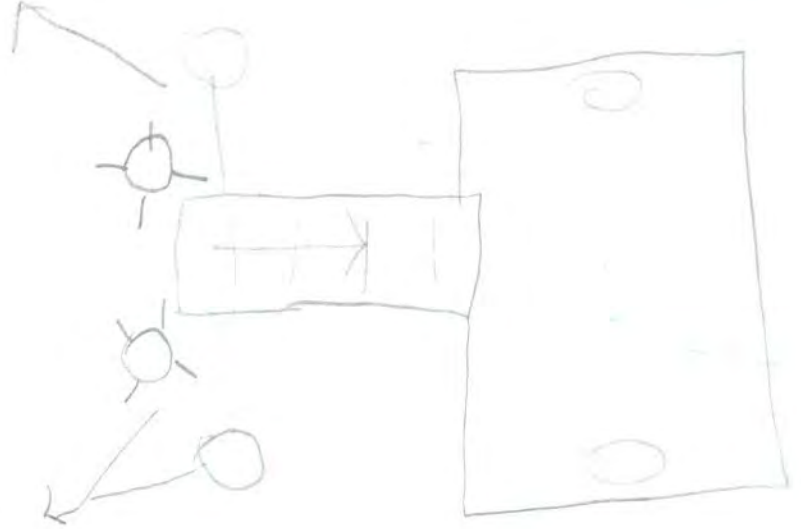
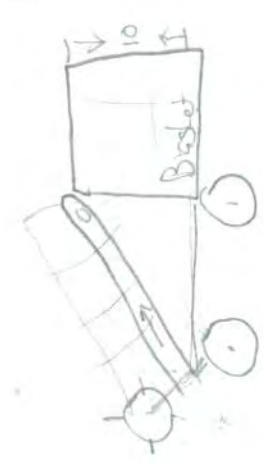
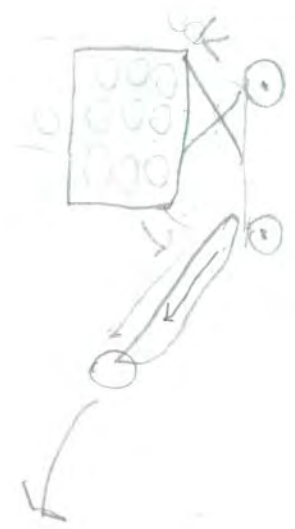
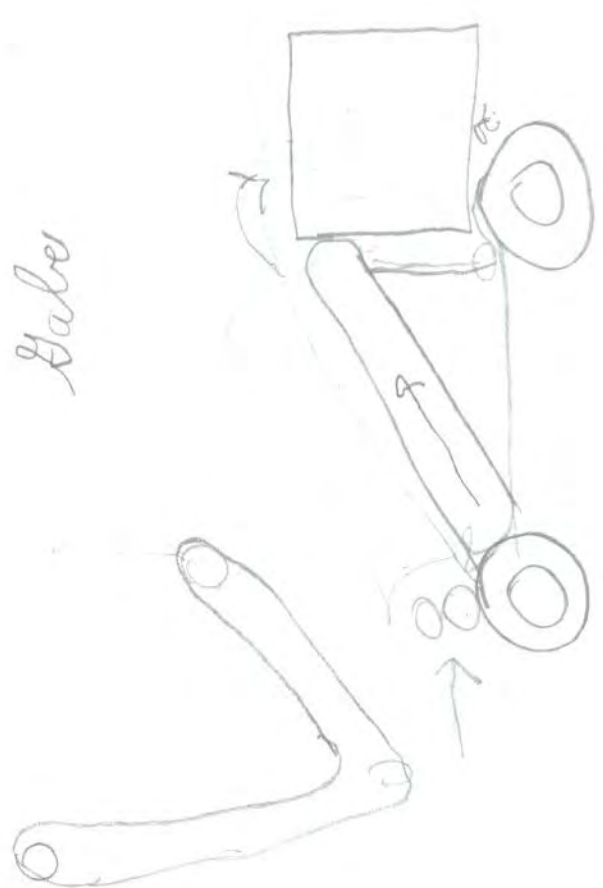
Ethan June 19/10



136720
1367206/5



Gabe

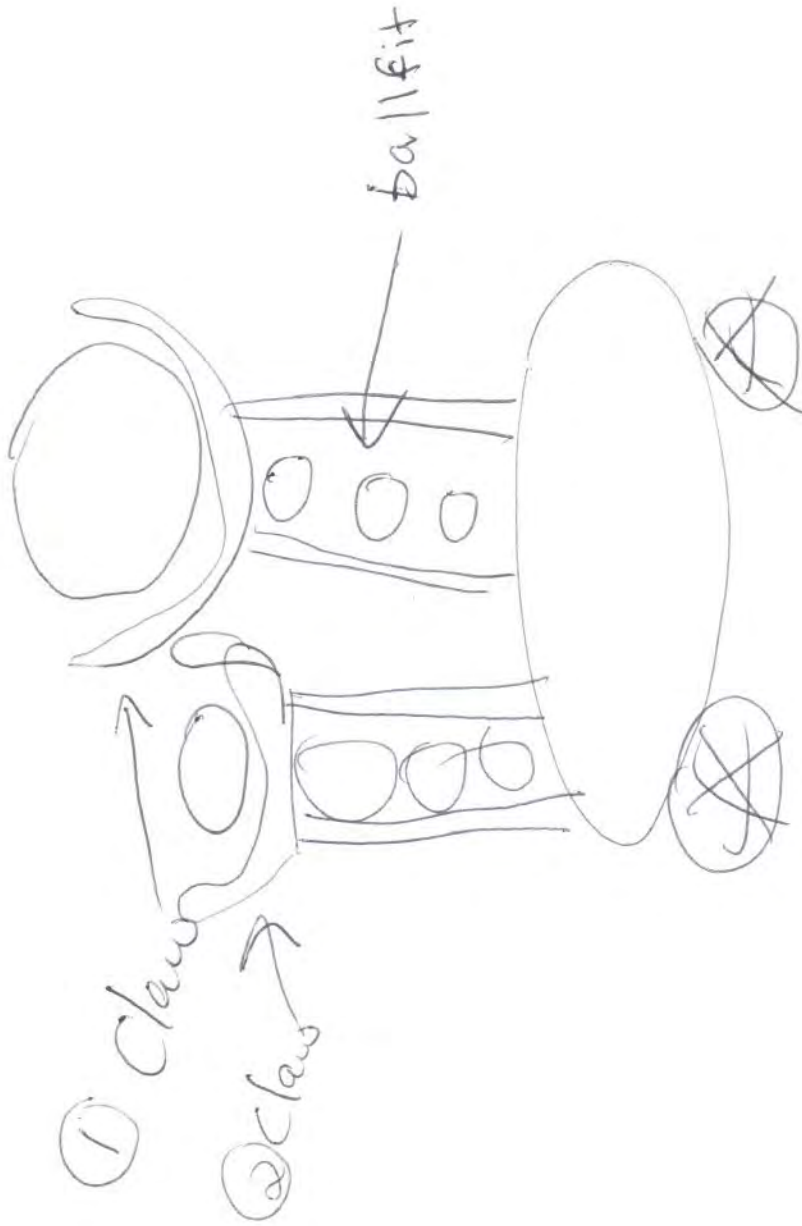


Wheels
Shooter
Feeder /
Conveyor
Lift

1-0-0



Destini,





7. 19. 15. build



18

Date: 7.19.15

Meeting Type: Group / Individual

Members Present: Connor, Luis, Gabe, Destiny

Meeting Topic: stem research and build

Today's Goal: To figure out our stem
research project and start
our build

Problems / Solutions / Comments:

We worked on stem research, we
and chose the topic = The
Chesapeake bay and how shell
fish clean the water. We need
to chose a topic sentence.

We worked on the robot's basket
and conveyor belt. The conveyor
belt is difficult to assemble.
Pegs are annoying.

Plan for next meeting:

Keep building and select
a topic sentence for stem
Research

Next Meeting: 8.15.15 Entry by: Gabe



7. 19. 15. conveyor belt



7. 19. 15. basket

5/8/2015

Destiny
Grace
Connor
Ethan
Gobie



Steam Progege

How oysters can clean
The Chesapeake bay.
We will make a artificial
oysters.

Our current design was
too big.

We are trying to make a better
Plan.

We are working on making
the conveyor belt shorter $9\frac{1}{4}$ inches



8.15.15
conveyor rebuild



conveyor
too big
8.15.15

Date: 8-28-15

Meeting Type: Group / Individual

Members Present: Conner, Luis, Destiny, Ethan, Grace, and Gabe

Meeting Topic: Continue to build the robot

Today's Goal: Continue building the robot

Problems / Solutions / Comments:

The problem was the kit didn't have all the pieces for the conveyor belt

The solutions Ms. Cannavo bought the pieces for the conveyor belt

Plan for next meeting:

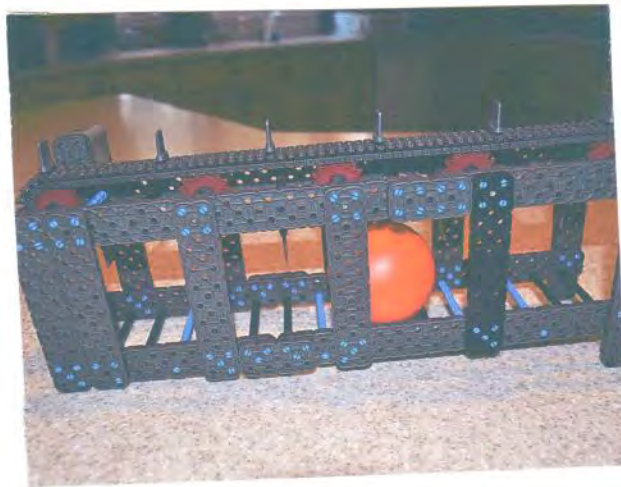
have wheel base done so we can attach to the conveyor belt and test it

Next Meeting: _____ Entry by: Destiny

8.28.15



Working on wheelbase and conveyor so we could attach them.



Finish conveyor but the spacing was wrong. There was too much room in between the flippers and the ball, so the ball wouldn't go up the conveyor. Need to make frame smaller.

Date: 9/4/15

Meeting Type: Group / Individual

Density

Members Present: Connor, Luis, Grace, Gabe,

Meeting Topic: _____

Today's Goal: Make wheel Base and
Conveyor Belt

Problems / Solutions / Comments:

The wheel base could't go
up the ramp

Solution: Put weight on the front
of the Robot so it can go
up the ramp.

Trying to get the sprockets
lined up on our conveyor
belt working on basket frame

Plan for next meeting:

Conveyor Belt needs to be
finished

Next Meeting: _____

Entry by: Grace



Testing
wheel base
↙

9.4.15



9.4.15

9.4.15. ↗
building
basket



Placing sprockets

26

Date: 9/11/15

Meeting Type: Group / Individual

Members Present: Destiny, Gabe, Grace, Luis,

Meeting Topic: Finish building conveyor and basket

Today's Goal: get it finished and start programming

Coach
Ethan

Problems / Solutions / Comments:

Coach went over basic programming with us.

Destiny finished the basket

Pros = holds 30 balls, is sturdy

Cons = not all the balls go out.

Were going to adjust the size of exit →
over

Plan for next meeting:

Fix the basket and conveyor and get them on the wheelbase soon.

Next Meeting: 9.18.15 Entry by: Gabe

and add beams in the corners to make the balls move to the middle and out the exit.



9. 11. 15.

coach went over programming



building wheel base



basket finished



testing basket

Date: 9/18/15

Meeting Type: Group / Individual

Members Present: Destiny Gabe Luis Connor Ethan

Meeting Topic: Get conveyor working Grace

Today's Goal: The conveyor belt needs to be attached to the wheelbase.

Problems / Solutions / Comments:

The conveyor belt is lopsided. It will not pick up any balls. We need to rebuild the conveyor next session.



Plan for next meeting:

Put the conveyor belt on the wheel base.

Next Meeting: 9/25/15 Entry by: Gabe

9. 18. 15.



Trying to figure out how to attach the new conveyor to the wheelbase.



Putting the battery in the brain.

brainstorming on how to rebuild the conveyor belt.



Date: Oct 9, 2015

Meeting Type: Group / Individual

Members Present: Grabe Grace Conner Luis
Destiny

Meeting Topic: _____

Today's Goal: finish conveyor Belt

Problems / Solutions / Comments:

We disided to make the conveyor
Belt long enough to pick up three
Balls at a time. We have started making
it but it is not complete.
Connor, Luis, and Destiny changed
the basket they changed the basket
so the balls could be forced
to go to the exit they put angled
bars to prevent the balls from
getting stuck.

Plan for next meeting:

To finish conveyor Belt

Next Meeting: _____ Entry by: Grace

10.9.15



fixing conveyor,
we decided to make
it go up and down
like an elevator
by adding a conveyor
and sprockets to the
other side.



The new basket
design only holds
22 balls instead
of 30.



Testing baskets
It worked.
But sometimes
some of the
balls still get
stuck.

32

Date: 11-6-15

Meeting Type: Group / Individual

Members Present: Connor, Destiny, Ethan, Gabe, Grace and Luis

Meeting Topic: Build and STEM Research

Today's Goal: To finished the conveyor

Problems / Solutions / Comments:

The problems we had to take apart the conveyor because we didn't put the rubber stopper on

The solutions we got are shooter finished so we are going to test it

Gabe did STEM research with Mrs. Vaiden

Plan for next meeting:

We need to get the conveyor finished



Entry by: Destiny

110 6.15



Building shooter.
We used compound
gearing to make
it go super fast.

gearing = 60 to 12
60 to 12
25 //



Making sure ball fits
inbetween shooter
wheels.

Added rubber bands
for extra grip.



Testing shooter

Date: 11/13/15

Meeting Type: Group / Individual

Members Present: Connor, Destiny, Ethan, Gabe, Grace and Lais

Meeting Topic: Putting the robot together

Today's Goal: Have a finished robot

Problems / Solutions / Comments:

The robot we made is too heavy and the plastic axles on the wheelbase are too weak and the wheels are bending out. we rebuilt the wheelbase using a metal axle and the wheels didn't bend out. we put the wheelbase on with rubber stoppers on it. we have a robot.

Plan for next meeting:

Start driving and programming.

Next Meeting: 11/20/15 Entry by: Lais



figuring out new wheelbase



We used long solid metal axels from 1 wheel to the other wheel and it made our robot super sturdy.

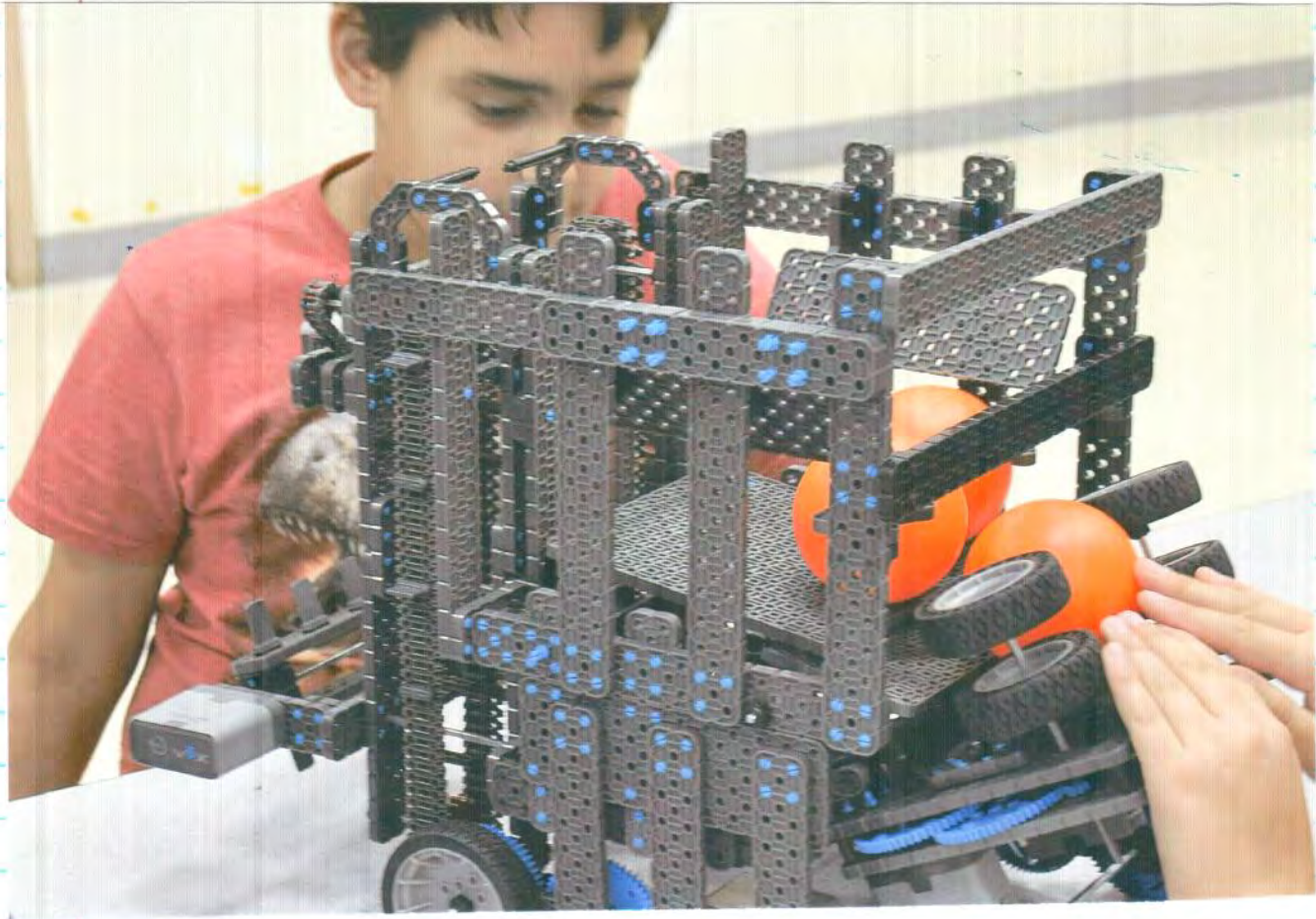


Snoopper is finished! yeah!

11, 13, 15,

36

Snapper



Snapper 1 is our first drivable prototype. It is almost the same as our original idea except it's more like an elevator than a conveyor. Snapper has a snatcher on the front to pull the balls into the elevator. The elevator is two sets of sprockets that pull the ball up into the basket. The basket holds 15 balls there's a hole in the back that lets the balls out. The shooter has 2 sets of wheels that → 37

spin very fast because of the compound gearing, $5/11$ and a nother which makes $25/1$. The wheel base uses a 36 tooth gear to a 60 tooth (3 to 5). There are two 60 tooth idler gears on either side of the 36 tooth gear, and two 60 tooth gears for driven gears at the wheels.

Date: 11.20.15

Meeting Type: Group / Individual

Members Present: Conner, Destiny, Gabe, Grace, Luis

Meeting Topic: Test drive the prototype

Today's Goal: Test drive the robot

Problems / Solutions / Comments:

Problem 1 = The Robot won't turn.
Solution = We decided to update the software and see if that will work. It is the easiest thing to do without rebuilding. If it doesn't work we will modify the robot.

Problem 2 = Balls stuck in basket and won't go in shooter.
Solution = The angle of the shooter should be all right so we thought →

Plan for next meeting:

Fix robot, Thanksgiving break won't meet for 2 weeks.

Next Meeting: _____

Entry by: Gabe

about making less space between the basket
and shooter.



measuring robot
very close to max
size



Why isn't robot
turning?



Problem with
Shooter

Date: 11.25.15

Meeting Type: Group / Individual

Members Present: Gabe

Meeting Topic: to figure out why our robot can't turn

Today's Goal: fix wheel base

Problems / Solutions / Comments:

Duh! the robot wouldn't turn because we had long axles across the middle connecting the sides that is why we couldn't turn.

Plan for next meeting:

Grace is coming to build the basket, then we can test it again

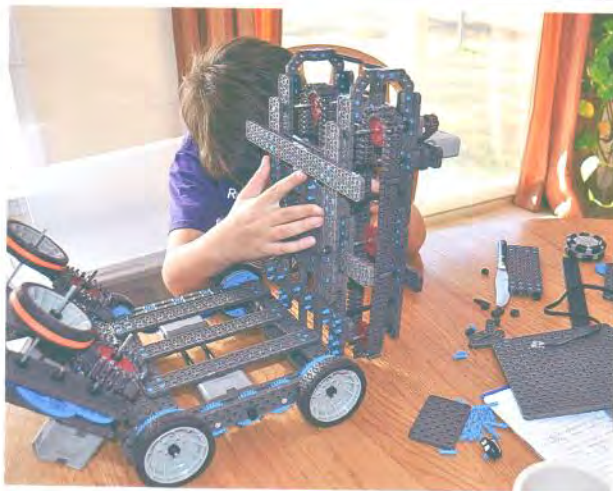
Next Meeting: _____ Entry by: Gabe

11, 25, 15,



Changed long metal axels and gave each wheel its own axle. Changed gearing to = 36/60 with 2 36 tooth idler gears

new gearing to make wheelbase shorter



reattached elevator and shooters. decided to build basket around the wheel/base

added flipper wheels in front of shooter to get balls from the basket to the shooters

Date: 11/27/15

Meeting Type: Group / Individual

Members Present: Gabe, Grace

Meeting Topic: Extra build time

Today's Goal: finish basket

Problems / Solutions / Comments:

The conveyor and grabber worked. The rubber grippers on the conveyor need fixing. The balls kept getting stuck.

Plan for next meeting:

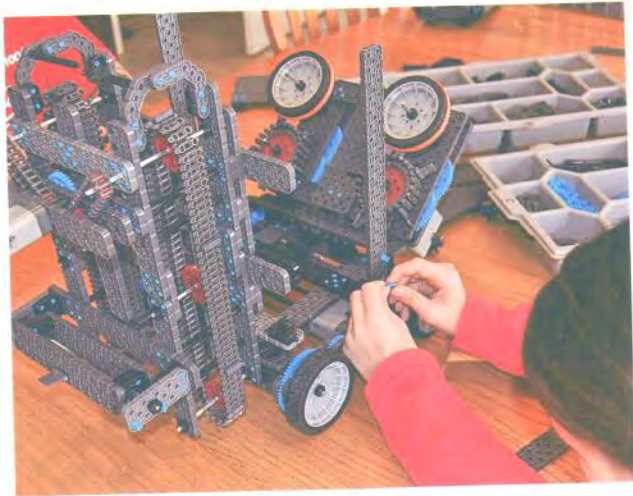
move the rod in the basket so only one ball can get out at a time.

Next Meeting: _____

Entry by: Gabe



Us making [↑] basket

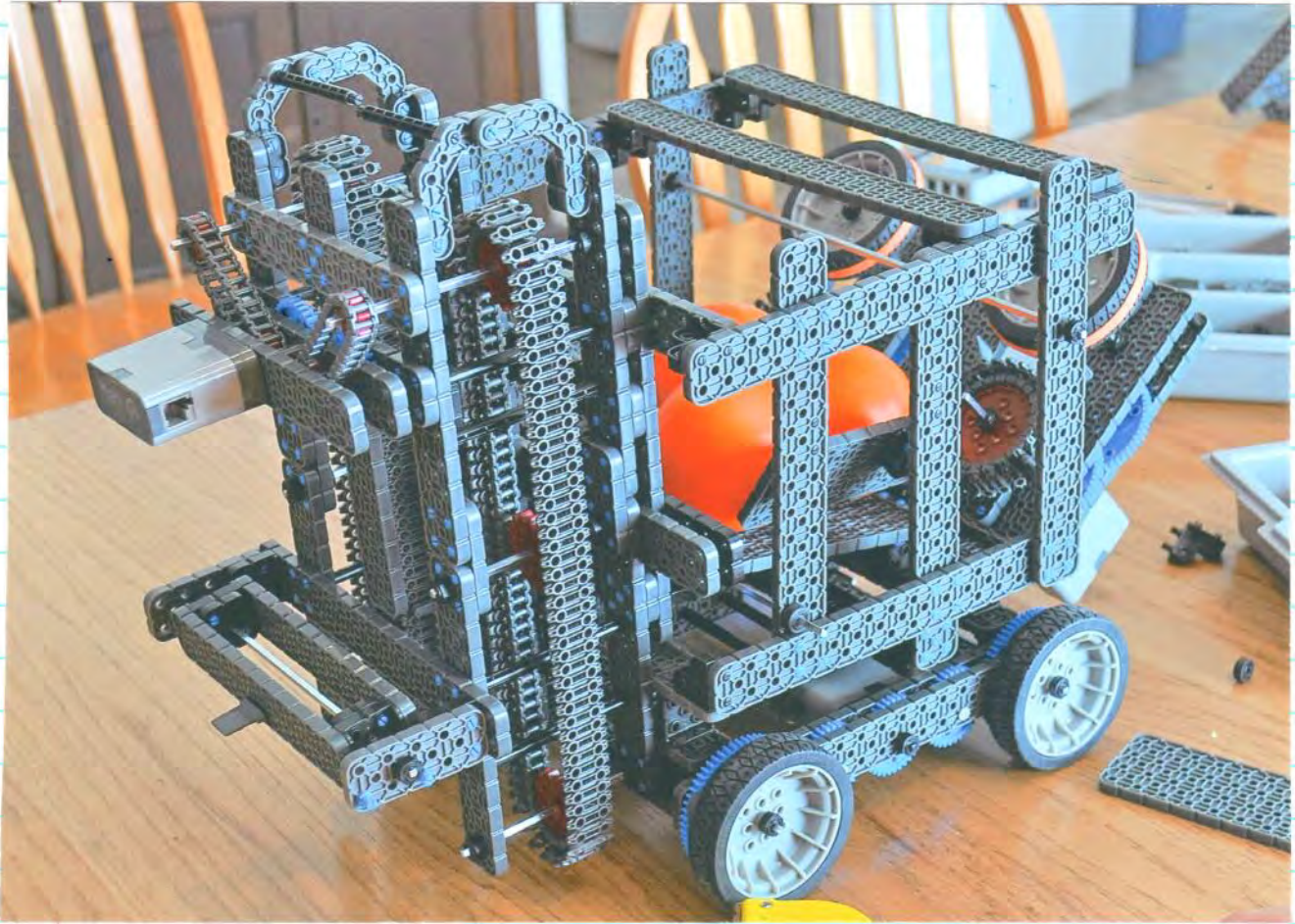


making basket [↗]
↓



and fixing the flippers
on the elevator

Snapper 2.0



The original snapper had problems turning. We think the wheelbase is creating scrub. We changed the frame of the wheelbase. We added flippers to the shooters to get the ball out of the basket. We also changed the size of the basket so now it can only hold 10 balls.

Date: 12.4.15

Meeting Type: Group / Individual

Members Present: Gabe, Destiny, Connor, Luis, Grace

Meeting Topic: Drive prototype

Today's Goal: Test prototype

Problems / Solutions / Comments:

It couldn't go up the ramp and it couldn't turn well. We're going to fix the robot by taking off 1' weight. We changed the front wheels to small. Now the robot could turn well but it is hard to control. It is too heavy. Team decided to build a smaller faster robot. We need to make sure the robot is able to →

Plan for next meeting:

Luis and Gabe are gonna meet up with each other and gonna modify the robot

Next Meeting: _____ Entry by: Gabe



get up the ramp

robot is having trouble getting up the ramp

me and Luis checking the robot



snapper is too big to get to the top of the ramp

can't! test driving to go up ramp



brainstorming on what to do. Snapper is too heavy, slow, big.

We're looking at our robot

Date: 12.6.15

Meeting Type: Group / Individual

Members Present: Gabe Luis

Meeting Topic: fix wheel base

Today's Goal: we were trying to make the wheel base shorter to get less scrubo

Problems / Solutions / Comments:

we drove the robot's wheelbase and it went great. We decided to get rid of the basket and raise the shooter. We are gonna make a smaller conveyor.

Plan for next meeting:

add conveyor and ball grabber. Then Test!

Next Meeting: _____

Entry by: Gabe

12.06.15



Made wheel base smaller took out idler gears to shorten wheel base = less scrub.



Making smarter conveyor, no basket.



Raised shooter so balls would go into the goal.

Date: 12.11.15

Meeting Type: Group / Individual

Members Present: Destiny Gabe Grace Luis

Meeting Topic: Remake robot a work on stem

Today's Goal: make questions for stem (about 20) and make robot competition ready

Problems / Solutions / Comments:

We made the robot lighter. were going to add omnis. were planning on making a stem research game show

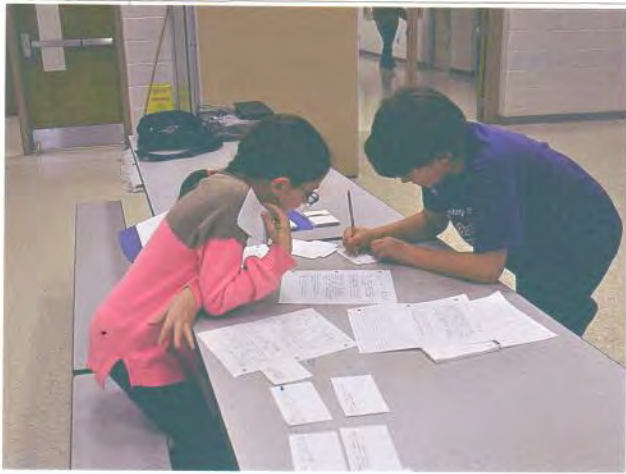
Plan for next meeting:

Finish robot, finish questions with answers for the Jeopardy game.



Entry by: Gabe

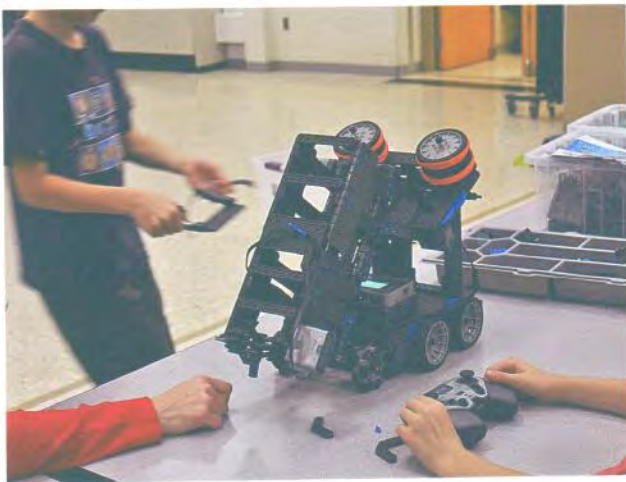
12.11.15



Making flash cards for STEM.

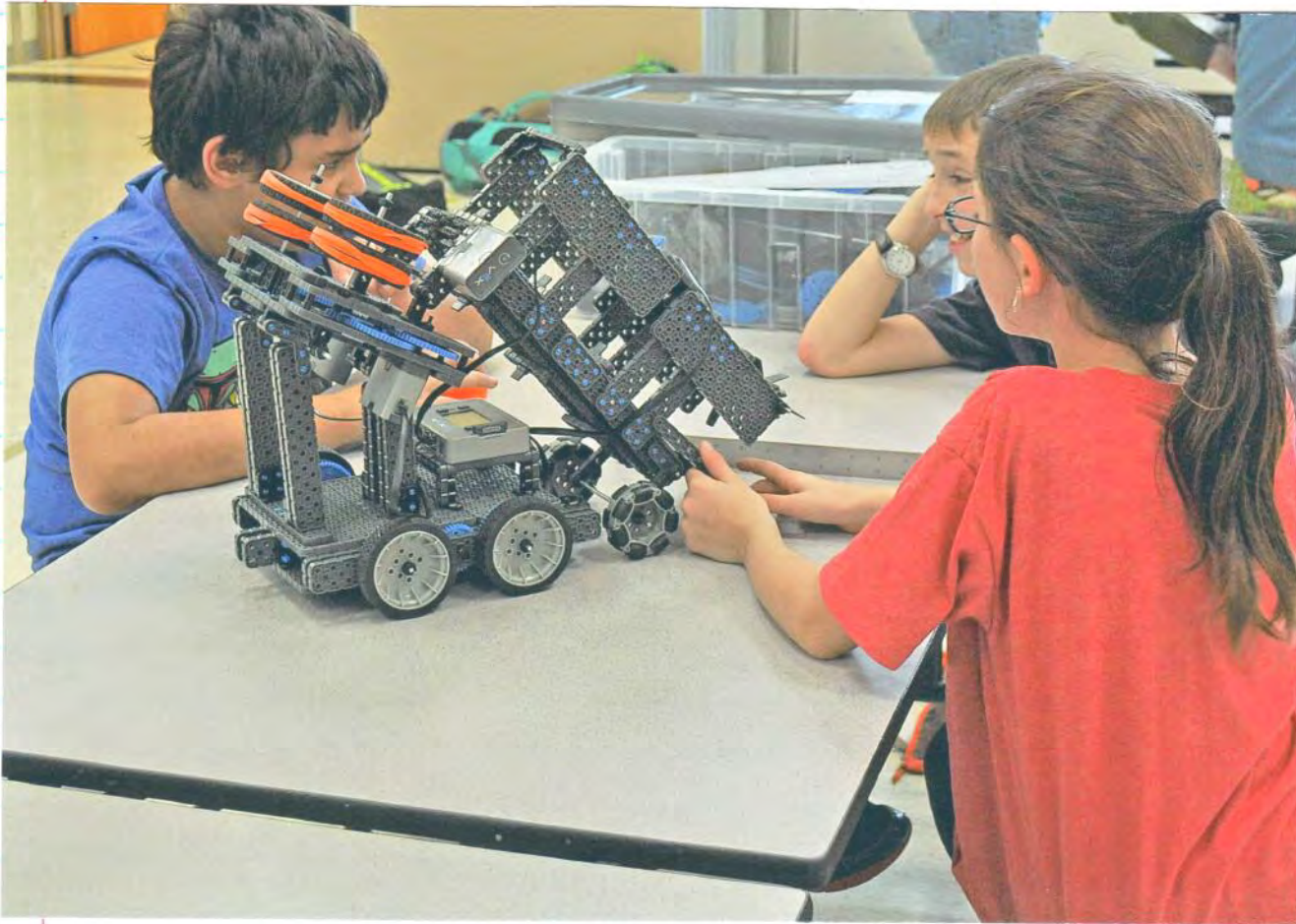


attaching conveyor to frame



adding omni wheels to front of conveyor so the conveyor will slide up the ramp.

Snapper 3.0



Snapper 2 worked great but
couldn't get up the ramp.
It was hard to make. Even
though it was very sturdy
it didn't do what it was
supposed to do, go up ramp
and knock all balls off
well getting parked since it
couldn't do this, we decided
to do a rebuild. Snapper
3's wheelbase is smaller.
Instead of having an elevator
we went back to our →

original design as a conveyor, it was attached to the frame of the shooter. We added omni wheels so the conveyor could ride up the ramp. We decided to get rid of the darn basket completely.

Date: 12.29.15

Meeting Type: Group / Individual

Members Present: Gabe Luis

Meeting Topic: driving practice and more building

Today's Goal: Practice driving
unfortunately we broke our
third robot

Problems / Solutions / Comments:

We broke our robot
solution is get new design
our robot, broke into 2
different pieces 1 conveyor
2 shooter.

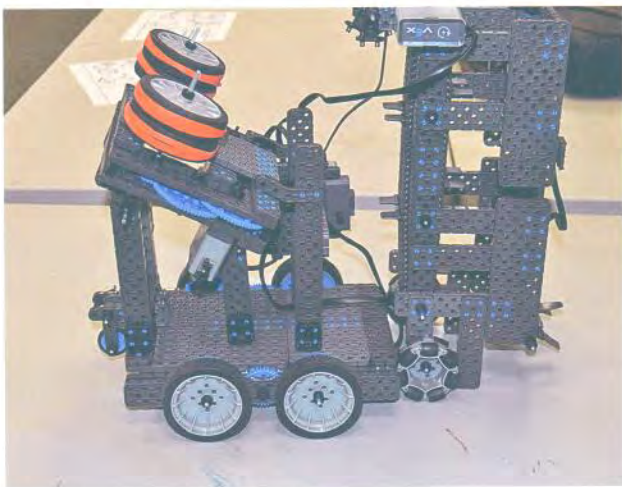
Plan for next meeting:

start building our fourth
robot.

Next Meeting: _____ Entry by: Gabe



our robot broke



the whole thing snapped



us thinking weather
we should fix it
or make a whole
new robot

Date: 12.30.15

Meeting Type: Group / Individual

Members Present: Gabe Luis

Meeting Topic: rebuild robot

Today's Goal: redesign robot

Problems / Solutions / Comments:

We attached the shooter directly to the conveyor so it would be 1 solid piece instead of 2 separate pieces. We flipped the conveyor so the flippers could grab the balls and pull it in. We attached the whole thing to the wheelbase. We used a long metal axel to hold the conveyor to the frame →

Plan for next meeting:

practice driving

Next Meeting: 1.3.16

Entry by: Dabe

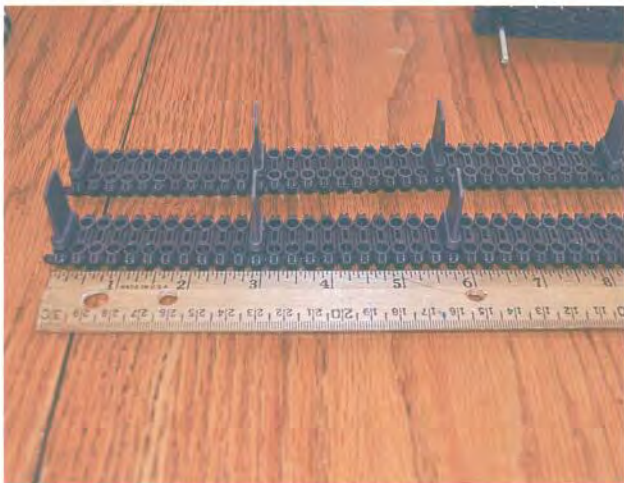
We attached the snatcher to the front of the conveyor. Then we tested it.

The robot drove well. And the shooters are very strong but have to be at full speed.

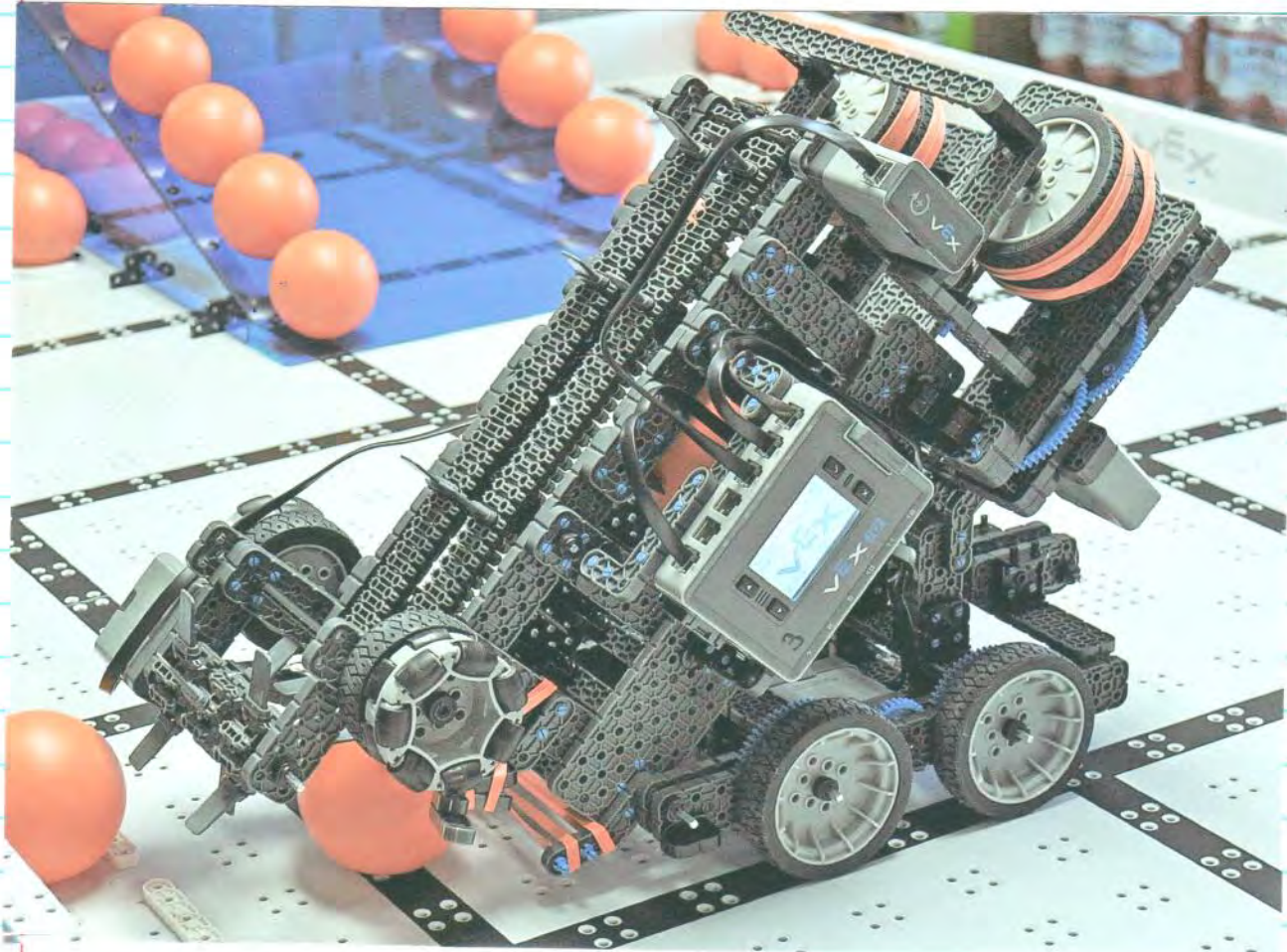
Problems =

1. it tried to flip over backwards. We added wheels to the front to add weight.

2. Balls had a hard time getting in the conveyor. We added rubber bands across the front to help guide them into the chute.



Snapper 4.0



Snapper 3 didn't work at all like we thought. The conveyor didn't ride up the ramp with its omni wheels. It would raise the front of the robot up when it hit the ramp and then the wheels would get caught on the frame of the ramp and the whole thing snapped apart. Everything else worked great. Snapper 4 is one solid piece. We connected the →

conveyor to the sheeters
with a 1000 mm axle.
We added a snatcher
to the front to get
the balls into the conveyor.
We added wheels to the
front so it wouldn't flip
backwards because the
wheels add weight. We put
rubber bands on the front
of the conveyor to get
the balls in. We also
have angle bearings to
feed the ball into the
conveyor. The brain is on
the side for easy
access.

Date: 1-2-16

Meeting Type: Group / Individual

Members Present: Gabe, and Grace

Meeting Topic: Driving Practice and STEM
Research

Today's Goal: Our goal was to practice
driving and start to do our STEM
research project for competition

Problems / Solutions / Comments:

When we practiced driving it
took us awhile to get used to
the buttons on the remote
controller but we managed to get
used to them. We ran some time
matches to get ready for competition
our best score was 34 pts. We
finished the draft for our STEM
research board. Our topic is
Saving the bay we have →

Plan for next meeting:

Our plan for next meeting is,
more driving practice programming and
STEM research

Next Meeting: _____

Entry by: Grace

51

real pictures from Mr. Lewis to go with our display.



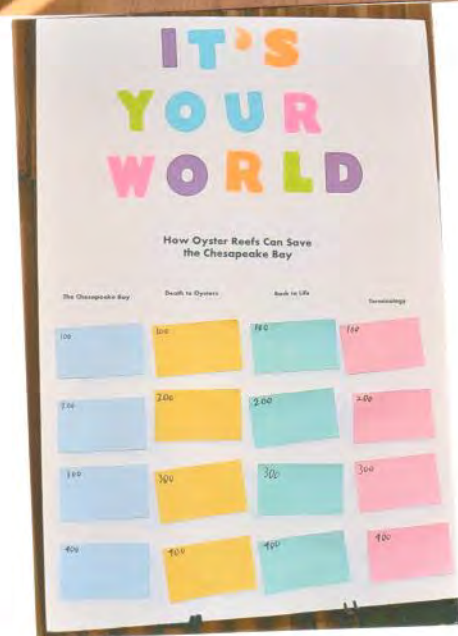
Ready to start driving!

Robot flipped off ramp and survived!
Very sturdy.
(and cute)



draft for our
Stem research
board.

STEM Research





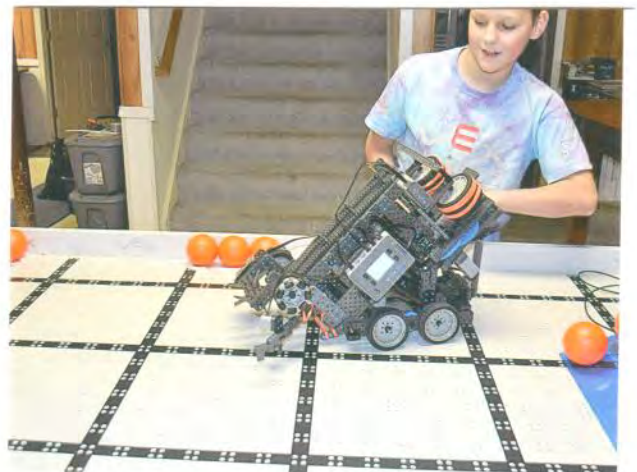
First STEM Practice



Jeopardy Fun time.



Driving practice





```

1 repeat (forever) {
2   armControl ( motor10 , BtnRUP , BtnRDown , 100 );
3   armControl ( motor4 , BtnRUP , BtnRDown , 100 );
4   armControl ( motor11 , BtnLUP , BtnLDown , 60 );
5   armControl ( motor5 , BtnLUP , BtnLDown , 60 );
6   tankControl ( ChD , ChA , 10 );
7 }
8

```

snatcher and conveyor left and right shooter

thumb sticks for driving program so we can drive well running the shooters and conveyor and snatcher

11/5 are shooters

10/4 are the conveyor and

The reason we did this is because we couldn't stretch are fingers so we

couldn't run both shooters the conveyor and the snatcher well we drive.

Program Flow

- repeat
- repeat (forever)
- repeatUntil
- while
- if
- if / else
- waitUntil
- // comment

Timing

- resetTimer
- wait

Simple Behavior

- backward
- forward
- moveMotor
- turnLeft

Motor and Sensor Setup

Firmware Download

Compile Program

Download to Robot

VEX Start Page | snapper controller.rbg

- ▼ Program Flow
 - repeat
 - repeat (forever)
 - repeatUntil
 - while
 - if
 - if / else
 - waitUntil
 - // comment
- ▼ Timing
 - resetTimer
 - wait
- ▼ Simple Behavior
 - backward
 - forward
 - moveMotor
 - turnLeft
 - turnRight
- ▼ Motor Command
 - moveMotorTarget
 - resetMotorEncoder
 - setMotor

```
1 repeat (forever) {  
2   armControl ( motor10 , BtnRUP , BtnRDown , 100 );  
3   armControl ( motor4 , BtnRUP , BtnRDown , 100 );  
4   armControl ( motor11 , BtnLUP , BtnLDown , 75 );  
5   armControl ( motor5 , BtnLUP , BtnLDown , 75 );  
6   tankControl ( ChD , ChA , 10 );  
7 }  
8
```

Changed shooter speed to 75 & 50

it can shoot from ramp

69

▼ Program Flow

- repeat
- repeat (forever)
- repeatUntil
- while
- if
- if / else
- waitUntil
- //comment

▼ Timing

- resetTimer
- wait

▼ Simple Behavior

- backward
- forward
- moveMotor
- turnLeft
- turnRight

▼ Motor Command

- moveMotorTarget
- resetMotorEncoder
- setMotor

```

1 repeat (forever) {
2   waitUntil ( getJoystickValue(ChA) > 5 );
3   resetTimer ( T1 );
4   repeatUntil ( getTimer(T1, seconds) == 40 ) {
5     armControl ( motor10 , BtnRUp , BtnRDown , 100 );
6     armControl ( motor4 , BtnRUp , BtnRDown , 100 );
7     armControl ( motor11 , BtnLUp , BtnLDown , 50 );
8     armControl ( motor5 , BtnLUp , BtnLDown , 50 );
9     tankControl ( ChD , ChA , 10 );
10  }
11  repeatUntil ( getTimer(T1, seconds) == 30 ) {
12    armControl ( motor10 , BtnRUp , BtnRDown , 100 );
13    armControl ( motor4 , BtnRUp , BtnRDown , 100 );
14    armControl ( motor11 , BtnLUp , BtnLDown , 90 );
15    armControl ( motor5 , BtnLUp , BtnLDown , 90 );
16    tankControl ( ChD , ChA , 10 );
17  }
18 }
19
  
```

Tele op for
 first driver
 to shoot from
 front end of the
 field by goal
 back to 90
 percent for
 2nd driver
 to shoot from
 ramp.



73

```

1 resetGyro ( gyro );
2 forward ( 2.75 , rotations , 50 );
  
```

Motors and Sensors Setup

| Port | Name | Type | Reversed | Drive Motor Side |
|---------|------------|--------------|-------------------------------------|------------------|
| motor1 | LeftMotor | VEX IQ Motor | <input checked="" type="checkbox"/> | Left |
| motor2 | | No motor | | |
| motor3 | | No motor | | |
| motor4 | conveyor | VEX IQ Motor | <input checked="" type="checkbox"/> | None |
| motor5 | ishooter | VEX IQ Motor | <input type="checkbox"/> | None |
| motor6 | rightMotor | VEX IQ Motor | <input type="checkbox"/> | Right |
| motor7 | | No motor | | |
| motor8 | | No motor | | |
| motor9 | | No motor | | |
| motor10 | snatcher | VEX IQ Motor | <input type="checkbox"/> | None |
| motor11 | ishooter | VEX IQ Motor | <input checked="" type="checkbox"/> | None |
| motor12 | | No motor | | |

OK Cancel Apply Help

1 and 6 had to be reversed we found this out after our test drive

- Program Flow
 - repeat
 - repeat (forever)
 - repeatUntil
 - while
 - if
 - if / else
 - waitUntil
 - //comment
- Timing
 - resetTimer
 - wait
- Simple Behavior
 - backward
 - forward
 - moveMotor
 - turnLeft
 - turnRight
- Motor Command
 - moveMotorTarget
 - resetMotorEncoder
 - setMotor



downloading software, updating brain
and sensors and the controller



We started a new file called
Ramp only!
And we setup our sensors and
motors.



We figured out how much 1 rotation
is.
It is 6 inches.

date 10/30/16
entry by Shane

now we can start programming.

YEAH!

- ▼ Program Flow
 - repeat
 - repeat (forever)
 - repeatUntil
 - while
 - if
 - if / else
 - waitUntil
 - //comment
- ▼ Timing
 - resetTimer
 - wait
- ▼ Simple Behavior
 - backward
 - forward
 - moveMotor
 - turnLeft
 - turnRight
- ▼ Motor Command
 - moveMotorTarget
 - resetMotorEncoder
 - setMotor

```

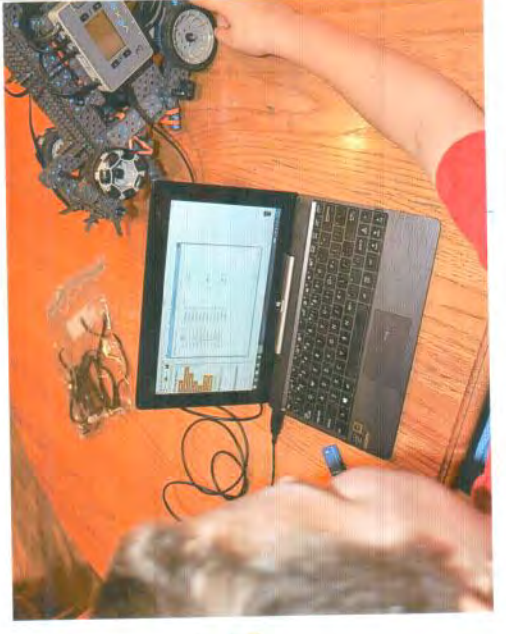
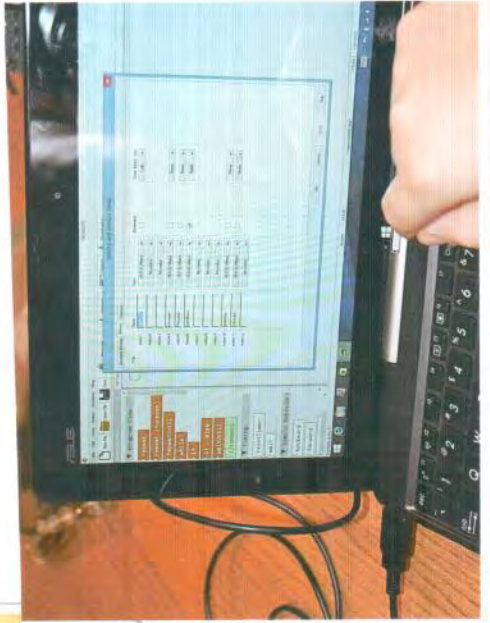
1 resetGyro ( gyro );
2 forward ( 2.75 , rotations , 50 );

```

Motors and Sensors Setup

| Port | Name | Motor | Sensor Type |
|--------|-------|-----------|--------------------|
| port1 | | Motor | Motor |
| port2 | | No Sensor | No Sensor |
| port3 | | No Sensor | No Sensor |
| port4 | | Motor | Motor |
| port5 | | Motor | Motor |
| port6 | | Motor | Motor |
| port7 | | No Sensor | No Sensor |
| port8 | | No Sensor | No Sensor |
| port9 | | Gyro | Gyro Sensor |
| port10 | | Motor | Motor |
| port11 | | Motor | Motor |
| port12 | color | | Color - Color Name |

OK



We decided to use the gyro so we had to reset gyro then we made it go forward, turn left, set multiple motors both shooters snatcher and conveyor then reset gyro, forward, wait 10 seconds so the shooters could get up to speed and the conveyor takes time to get the balls to the shooter then we want it to go back and fourth to get all the balls in the shooter or knock them off the ramp. This was a very time consuming program.

From: Charles Skinner <caskinner@smcps.org>

To: slcannavo <slcannavo@aol.com>

Subject: Re: Help me PLEASE!

Date: Fri, Jan 8, 2016 5:18 pm

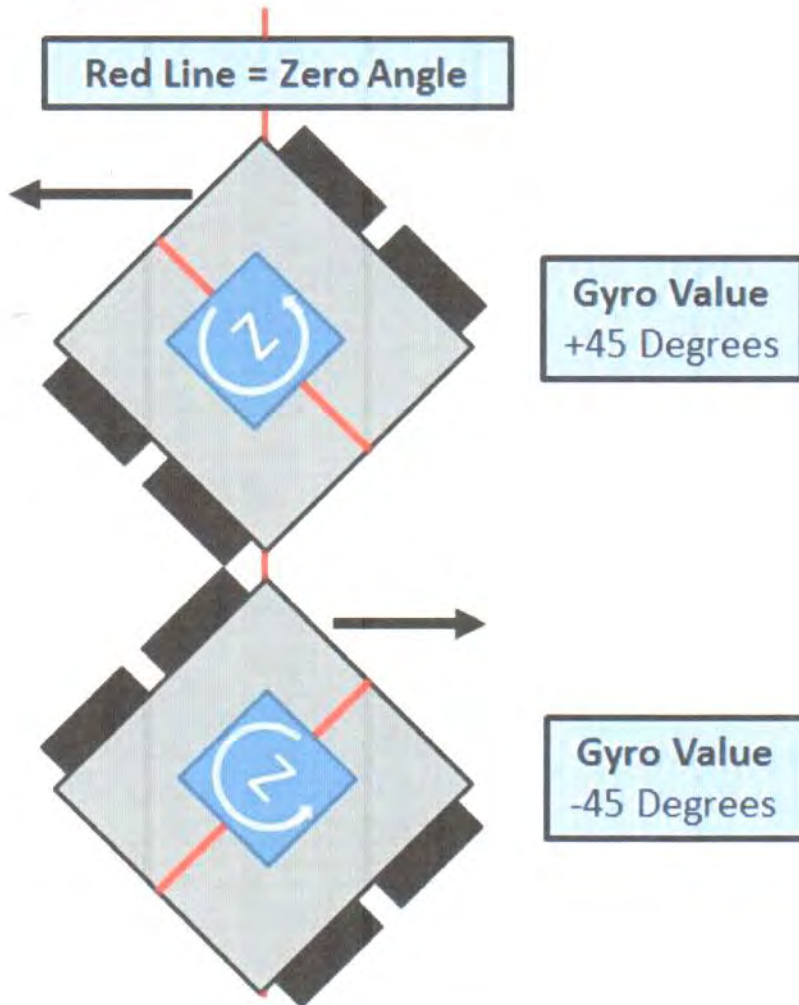
77

Hi Sarah,

The gyro sensor is very cool and useful and not too hard to work with.

You do need to know that every time you use the reset gyro command you are setting the current heading to "0".

Then when the robot turns the gyro measures degrees from that reset heading of zero. Most important, clockwise is different from counter clockwise:



Help with
Gyro

So take this example code:

```
resetGyro (gyroSensor);  
repeatUntil (getGyroDegrees (gyroSensor) > 90)  
{  
  setMotor (leftMotor, -50);  
  setMotor (rightMotor, 50);  
}
```

```

1 } resetGyro ( gyro );
2 } forward ( 2.75 , rotations , 50 );
3 } repeatUntil ( getGyroDegrees(gyro) >= 82 ) {
4 }   setMotor ( motor1 , -50 );
5 }   setMotor ( motor6 , 50 );
6 }
7 } setMultipleMotors ( 85 , conveyor , rshooter , snatcher , lshooter );
8 } resetGyro ( gyro );
9 } forward ( 5.65 , rotations , 50 );
10 } wait ( 10 , seconds );
11 } turnLeft ( .2 , rotations , 50 );
12 } forward ( .2 , rotations , 50 );
13 } wait ( 2 , seconds );
14 } turnRight ( .2 , rotations , 50 );
15 } wait ( 5 , seconds );
16 } turnRight ( .25 , rotations , 50 );
17 } forward ( .5 , rotations , 50 );
18 } wait ( 2 , seconds );
19 } turnLeft ( .3 , rotations , 50 );
20 } wait ( 25 , seconds );
21 }
  
```



Program Flow

- repeat
- repeat (forever)
- repeatUntil
- while
- if
- if / else
- waitUntil
- //comment

Timing

- resetTimer
- wait

Simple Behavior

- backward
- forward
- moveMotor
- turnLeft

81

stem research
Jeopardy game

programming



File Edit View Window Help

New File Save

Motor and Sensor Setup

Firmware Download

Compile Program

Load to .bot

VEX Start Page Jeopardy game (2).rbg

Program Flow

- repeat
- repeat (forever)
- repeatUntil
- while
- if
- if / else
- waitUntil
- // comment

Timing

- resetTimer
- wait

Simple Behavior

- backward
- forward
- moveMotor
- turnLeft
- turnRight

Motor Command

- moveMotorTarget
- resetMotorEncoder
- setMotor
- turnRight

```

1 repeat (forever) {
2   while ( getTimer(T1, seconds) < 2000 ) {
3     if ( getBumperValue(bumpersensor1) == false ) {
4       setTouchLEDColor ( touchedLED , colorRed );
5     } else {
6       playSound ( soundTada );
7       setTouchLEDColor ( touchedLED , colorLimeGreen );
8       wait ( 3 , seconds );
9     }
10    if ( getBumperValue(bumpersensor2) == false ) {
11      setTouchLEDColor ( touchedLED , colorRed );
12    } else {
13      setTouchLEDColor ( touchedLED , colorBlueGreen );
14      playSound ( soundCarAlarm2 );
15      wait ( 3 , seconds );
16    }
17    if ( getBumperValue(bumpersensor3) == false ) {
18      setTouchLEDColor ( touchedLED , colorRed );
19    } else {
20      setTouchLEDColor ( touchedLED , colorViolet );
21      playSound ( soundGasFillup );
22      wait ( 3 , seconds );
23    }
24    if ( getBumperValue(bumpersensor4) == false ) {
25      setTouchLEDColor ( touchedLED , colorRed );
26    } else {
27      setTouchLEDColor ( touchedLED , colorDarkYellow );
28      playSound ( soundRatchet4 );

```

82



programming jeopardy game.

Program Flow

- repeat
- repeat (forever)
- repeatUntil
- while
- if
- if / else
- waitUntil
- //comment

Timing

- resetTimer
- wait

Simple Behavior

- backward
- forward
- moveMotor
- turnLeft
- turnRight

Motor Command

- moveMotorTarget
- resetMotorEncoder
- setMotor

```

1 resetGyro ( port9 );
2 // stopAllMotors ( );
3 setMotor ( motor1 , -70 );
4 setMotor ( motor6 , 70 );
5 waitUntil ( getGyroDegrees(gyro) >= 96 );
6 setMultipleMotors ( 70 , motor4 , noMotorOnPort , motor10 , noMotorOnPort );
7 forward ( 4 , rotations , 65 );
8 // wait ( 2 , seconds );
9 // forward ( .8 , rotations , 50 );
10 wait ( 2 , seconds );
11 forward ( 1 , rotations , 50 );
12 wait ( 2 , seconds );
13 resetGyro ( port9 );
14 stopMotor ( conveyor );
15 backward ( 4.5 , rotations , 50 );
16 moveMotor ( motor1 , .4 , rotations , -50 );
17 moveMotor ( conveyor , -1 , rotations , 50 );
18 setMultipleMotors ( 1000 , motor5 , noMotorOnPort , motor11 , noMotorOnPort );
19 wait ( 4 , seconds );
20 setMultipleMotors ( 100 , motor4 , noMotorOnPort , motor10 , noMotorOnPort );
21 wait ( 6 , seconds );
22 stopMultipleMotors ( motor5 , motor11 , noMotorOnPort );
23 moveMotor ( motor1 , .5 , rotations , 40 );
24 moveMotor ( motor6 , .5 , rotations , -50 );
25 forward ( 4.5 , rotations , 75 );
26 wait ( 3 , seconds );
    
```

(classified)

83
 Super secret program for
 when we get to worlds.

84



7:40 PM

```

28 } backward ( 2 , rotations ▼ , 50 ) ;
29 } moveMotor ( motor1 ▼ , .6 , rotations ▼ , -50 ) ;
30 } backward ( 2.5 , rotations ▼ , 50 ) ;
31 } moveMotor ( conveyor ▼ , 1 , rotations ▼ , -50 ) ;
32 } setMultipleMotors ( 1000 , motor5 ▼ , motor11 ▼ , noMotorOnPort ▼ , noMotorOnPort ▼ ) ;
33 } wait ( 3 , seconds ▼ ) ;
34 } setMotor ( conveyor ▼ , 100 ) ;
35 } wait ( 6 , seconds ▼ ) ;
// start here for original program
37 } stopAllMotors ( ) ;
38 } resetGyro ( gyro ▼ ) ;
39 } setMotor ( motor1 ▼ , 75 ) ;
40 } setMotor ( motor6 ▼ , -75 ) ;
41 } waitUntil ( getGyroDegrees(gyro) ▼ <= ▼ -82 ) ;
42 } forward ( 2 , rotations ▼ , 75 ) ;
43 } resetGyro ( gyro ▼ ) ;
44 } repeatUntil ( getGyroDegrees(gyro) ▼ >= ▼ 68 ) {
45 }   turnLeft ( 90 , degrees ▼ , 50 ) ;
46 }
47 } stopAllMotors ( ) ;
48 } setMultipleMotors ( 100 , conveyor ▼ , snatcher ▼ , Lshooter ▼ , Rshooter ▼ ) ;
49 } forward ( 6 , rotations ▼ , 100 ) ;
50 } wait ( 5 , seconds ▼ ) ;
51 } stopAllMotors ( ) ;
52 } wait ( 15 , seconds ▼ ) ;
53 }

```

```

repeat
repeat (forever)
repeatUntil
while
if
if / else
waitUntil
//comment
▼ Timing
resetTimer
wait
▼ Simple Behavi
backward
forward
moveMotor
turnLeft
turnRight
▼ Motor Command
moveMotorTarget
resetMotorEncoc
setMotor

```



We're Going To States!



Elementary Excellence



Programming Skills

Jasmine

I liked at the last competition is when our team didn't fall off the ramp during programming.

One thing I didn't like

when the alliance partner did not come up the ramp to get extra points. I learned to always talk to the alliance partner so we can work together to get the most points during the alliance

86

driving.



Luis

I learned to talk to your audience partner and get a plan. And make a plan with your driving skills buddy. Stem could use more pizas, Pit needs color and decoration. I would even out the weight so it won't tip over.



Gabe Robotics

- I though programming went really well.
- Alliance could've went better.
- We need to be nicer to each other.
- We need to make sure we shake hands at the end every time.
- The balls kept being shot over the goals.



90



After stem presentation

Grace

January 31, 2016

At the competition my experience was, it was very crowded and we were moving around a lot, and also had to be really careful with the robot. A different driving strategy would be to grab as many balls as possible and bring them up the ramp and shoot them and driver 2 would grab the balls of the top of the ramp and shoot those balls.



92



Destiny

93

I liked when we were cheering for teams. I didn't like when a team was disqualified because they touched their robot. I learned that I need to raise my hand and tell the judge I need to touch my robot then I can put it in the starter square.





95

The competition was very very stressful



Please go up the RAMP!



Please don't fall off the RAMP!



Please let our score be high enough

96



Does the
judge like
our design



please let
the judges
like our STEM

If we made sure we would
have fun





Excellence! This was
worth it



Both our schools' teams
are going to states,
This was the best
part of the day!

Problems and solutions

1st problem is our Teleop program would start before we were ready and we wouldn't know, so the shooter speed would be too high for the first drivers.

1st solution, we added a color LED so we would know when the teleop hasn't started (red) when it starts and shooter speed is at 40% (green) and when it turns purple we know we need to switch drivers and the shooter speed is at 90%.

2nd problem is the balls are shooting over the goal.

2nd solution the 1st solution solves problem 2 as well.

3rd problem is our robot was getting stuck on the wall by the ramp when we were collecting balls.



3rd solution we added some mini wheels to the side so the robot would glide across the wall

4th problem the robot was flipping on the ramp

4th solution we added omni wheels to the frame for more weight.

5th problem our alliance partners couldn't get up the ramp with us for the 15 points. Also they want up the ramp first and knocked the balls off and we need to go up and get those balls

5th solution we decided to make 2 more teleops so we can shoot from the table the whole time instead of the ramp, and we make one so we shoot from the ramp the first half. And if they can't get up the ramp well we will ask if we can push them.

▼ Program Flow

- repeat
- repeat (forever)
- repeatUntil
- while
- if
- if / else
- waitUntil
- // comment

▼ Timing

- resetTimer
- wait

▼ Simple Behavior

- backward
- forward
- moveMotor
- turnLeft
- turnRight

▼ Motor Command

- moveMotorTarget
- resetMotorEncoder
- setMotor

```

1 repeat (forever) {
2   armControl ( motor10 , BtnRUp , BtnRDown , 100 );
3   armControl ( motor4 , BtnRUp , BtnRDown , 100 );
4   armControl ( motor11 , BtnLUp , BtnLDown , 40 );
5   armControl ( motor5 , BtnLUp , BtnLDown , 40 );
6   tankControl ( ChD , ChA , 10 );
7 }
8
    
```

We made this program because some of our alliance partners knocked all the balls off the ramp right away. Because our robot shoots balls from the ramp we couldn't do anything for the second part of the match. This program will let us work from the game table if we need to.



- this shows us the timer wasn't started

this starts the timer

led shows green for 40 percent shooter speed. For driver one.

driver two

led violet for 90 percent shooter speed

103

50snapper = table then ramp

```

1 repeat (forever) {
2   setTouchLEDColor ( port3 , colorRed );
3   waitUntil ( joystickValue(ChA) > 10 );
4   setMultipleMotors ( 100 , motor1 , motor6 , noMotorOnPort , noMotorOnPort );
5   resetTimer ( timer1 );
6   repeatUntil ( getTimer(T1, seconds) == 30 ) {
7     armControl ( motor10 , BtnRUP , BtnRDown , 100 );
8     armControl ( motor4 , BtnRUP , BtnRDown , 100 );
9     armControl ( motor11 , BtnLUP , BtnLDown , 40 );
10    armControl ( motor5 , BtnLUP , BtnLDown , 40 );
11    tankControl ( ChD , ChA , 10 );
12    setTouchLEDColor ( port3 , colorGreen );
13  }
14  resetTimer ( timer1 );
15  repeatUntil ( getTimer(T1, seconds) == 35 ) {
16    armControl ( motor10 , BtnRUP , BtnRDown , 100 );
17    armControl ( motor4 , BtnRUP , BtnRDown , 100 );
18    armControl ( motor11 , BtnLUP , BtnLDown , 90 );
19    armControl ( motor5 , BtnLUP , BtnLDown , 90 );
20    tankControl ( ChD , ChA , 10 );
21    setTouchLEDColor ( port3 , colorViolet );
22  }
23  setTouchLEDColor ( port3 , colorRed );
24 }
25
  
```

Program Flow

- repeat
- repeat (forever)
- repeatUntil
- while
- if
- if / else
- waitUntil
- //comment

Timing

- resetTimer
- wait

Simple Behavi

- backward
- forward
- moveMotor
- turnLeft
- turnRight

Motor Commanc

- moveMotorTarget
- resetMotorEncoc
- setMotor

Opposite of 50snapper

```

1 repeat (forever) {
2   setTouchLEDColor ( port3 , colorRed );
3   waitUntil ( getJoystickValue(ChA) > 10 );
4   setMultipleMotors ( 100 , motor1 , motor6 , noMotorOnPort );
5   resetTimer ( timer1 );
6   repeatUntil ( getTimer(T1, seconds) == 30 ) {
7     armControl ( motor10 , BtnRUP , BtnRDown , 100 );
8     armControl ( motor4 , BtnRUP , BtnRDown , 100 );
9     armControl ( motor11 , BtnLUP , BtnLDown , 90 );
10    armControl ( motor5 , BtnLUP , BtnLDown , 90 );
11    tankControl ( ChD , ChA , 10 );
12    setTouchLEDColor ( port3 , colorGreen );
13  }
14  resetTimer ( timer1 );
15  repeatUntil ( getTimer(T1, seconds) == 35 ) {
16    armControl ( motor10 , BtnRUP , BtnRDown , 100 );
17    armControl ( motor4 , BtnRUP , BtnRDown , 100 );
18    armControl ( motor11 , BtnLUP , BtnLDown , 40 );
19    armControl ( motor5 , BtnLUP , BtnLDown , 40 );
20    tankControl ( ChD , ChA , 10 );
21    setTouchLEDColor ( port3 , colorViolet );
22  }
23  setTouchLEDColor ( port3 , colorRed );
24 }
25
  
```

-- Ramp first

-- table second

Use this when working with a partner who has a scoop.

▼ Program Flow

- repeat
- repeat (forever)
- repeatUntil
- while
- if
- if / else
- waitUntil
- //comment

▼ Timing

- resetTimer
- wait

▼ Simple Behavior

- backward
- forward
- moveMotor
- turnLeft
- turnRight

▼ Motor Command

- moveMotorTarget
- resetMotorEncoder
- setMotor

- if
- if / else
- waitUntil
- // comment
- ▼ Timing
 - resetTimer
 - wait
- ▼ Simple Behavior
 - backward
 - forward
 - moveMotor
 - turnLeft
 - turnRight
- ▼ Motor Command
 - moveMotorTarget
 - resetMotorEncoder
 - setMotor
 - setMotorBrakeMode
 - setMotorReverse
 - setMotorTarget
 - setMultipleMotors

```

1 setTouchLEDColor ( TouchLED , colorRed );
2 waitUntil ( getTouchLEDValue(TouchLED) == true );
3 setTouchLEDColor ( TouchLED , colorBlueGreen );
4 resetGyro ( port9 );
5 setMotor ( motor1 , -70 );
6 setMotor ( motor6 , 70 );
7 waitUntil ( getGyroDegrees(gyro) >= 94 );
8 setMultipleMotors ( 75 , motor4 , motor10 , noMotorOnPort );
9 forward ( 3.26 , rotations , 75 );
10 wait ( .3 , seconds );
11 forward ( .75 , rotations , 50 );
12 wait ( .5 , seconds );
13 forward ( .85 , rotations , 50 );
14 wait ( 1 , seconds );
15 resetGyro ( port9 );
16 stopMotor ( conveyor );
17 moveMotor ( conveyor , -.5 , rotations , 50 );
18 setMultipleMotors ( 44 , motor5 , motor11 , noMotorOnPort );
19 backward ( 4 , rotations , 70 );
20 moveMotor ( motor1 , .29 , rotations , -50 );
21 wait ( 1 , seconds );
22 repeat ( 6 ; ) {
23     setMultipleMotors ( 100 , motor4 , motor10 , noMotorOnPort );
24     wait ( 1 , seconds );
25     stopMultipleMotors ( motor4 , motor10 , noMotorOnPort );
    
```

107

▼ stopAllMotors

- if
- if / else
- waitUntil
- // comment
- ▼ Timing
 - resetTimer
 - wait
- ▼ Simple Behavior
 - backward
 - forward
 - moveMotor
 - turnLeft
 - turnRight
- ▼ Motor Command
 - moveMotorTarget
 - resetMotorEncoder
 - setMotor
 - setMotorBrakeMode
 - setMotorReverse
 - setMotorTarget
 - setMultipleMotors
 - stopAllMotors
 - setMotor
 - setMotorBrakeMode
 - setMotorReverse
 - setMotorTarget

```

27 )
28 stopAllMotors ( );
29 playSound ( soundGasFillup );
30 waitUntil ( getTouchLEDValue(TouchLED) == true );
31 setTouchLEDCOLOR ( TouchLED, colorViolet );
// start here for original program
33 resetGyro ( gyro );
34 forward ( 2.6, rotations, 60 );
35 resetGyro ( gyro );
36 setMotor ( motor1, -50 );
37 setMotor ( motor6, 50 );
38 waitUntil ( getGyroDegrees(gyro) >= 77 );
39 stopAllMotors ( );
40 resetGyro ( gyro );
41 setMultipleMotors ( 67, conveyor, snatcher, Lshooter, Rshooter );
42 forward ( 5.44, rotations, 70 );
43 turnLeft ( .075, rotations, 50 );
44 wait ( 7, seconds );
45 turnRight ( .275, rotations, 50 );
46 forward ( .3, rotations, 50 );
47 wait ( .751, seconds );
48 turnLeft ( .37, rotations, 50 );
49 wait ( 7, seconds );
50 turnLeft ( .3, rotations, 50 );
51 forward ( .4, rotations, 50 );
52 wait ( .75, seconds );
53 turnRight ( .32, rotations, 50 );
54 wait ( 5, seconds );
55 stopAllMotors ( );
56 repeat ( 5 ) {
57   playSound ( soundCarAlarm4 );

```



Program Flow

- repeat
- repeat (forever)
- repeatUntil
- while
- if
- if / else
- waitUntil
- //comment

Timing

- resetTimer
- wait

Simple Behavior

- backward
- forward
- moveMotor
- turnLeft
- turnRight

Motor Command

- moveMotorTarget
- resetMotorEncoder
- setMotor

```

1 repeat (forever) {
2   setTouchLEDColor ( touchLED , colorGreen );
3   waitUntil ( getTouchLEDValue(touchLED) == true );
4   setTouchLEDColor ( touchLED , colorRed );
5   resetTimer ( T1 );
6   while ( getTimer(T1, seconds) < 220 ) {
7     if ( getBumperValue(bumpersensor1) == false ) {
8       setTouchLEDColor ( touchLED , colorRed );
9     } else {
10      playSound ( soundTada );
11      setTouchLEDColor ( touchLED , colorLimeGreen );
12      wait ( 3 , seconds );
13    }
14    if ( getBumperValue(bumpersensor2) == false ) {
15      setTouchLEDColor ( touchLED , colorRed );
16    } else {
17      setTouchLEDColor ( touchLED , colorBlueGreen );
18      playSound ( soundCarAlarm2 );
19      wait ( 3 , seconds );
20    }
21    if ( getBumperValue(bumpersensor3) == false ) {
22      setTouchLEDColor ( touchLED , colorRed );
23    } else {
24      setTouchLEDColor ( touchLED , colorViolet );
25      playSound ( soundGasFillup );
26      wait ( 3 , seconds );
27    }
  }
  }
  
```

104



Program Flow

- repeat
- repeat (forever)
- repeatUntil
- while
- if
- if / else
- waitUntil
- //comment

Timing

- resetTimer
- wait

Simple Behavior

- backward
- forward
- moveMotor
- turnLeft
- turnRight

Motor Command

- moveMotorTarget
- resetMotorEncoc
- setMotor

```

31 setTouchLEDColor ( touchLED , colorDarkYellow );
32 playSound ( soundHeadlightsOn );
33 wait ( 3 , seconds );
34 }
35 if ( getBumperValue(bumpersensor5) == false ) {
36 setTouchLEDColor ( touchLED , colorRed );
37 } else {
38 setTouchLEDColor ( touchLED , colorLimeGreen );
39 playSound ( soundWrongways );
40 wait ( 3 , seconds );
41 }
42 if ( getBumperValue(Judges) == false ) {
43 setTouchLEDColor ( touchLED , colorRed );
44 } else {
45 setTouchLEDColor ( touchLED , colorGreen );
46 playSound ( soundSiren4 );
47 wait ( 3 , seconds );
48 }
49 }
50 repeat ( 5 ; ) {
51 playSound ( soundCarAlarm4 );
52 setTouchLEDColor ( touchLED , colorRed );
53 wait ( .1 , seconds );
54 setTouchLEDColor ( touchLED , colorGreen );
55 }
56 }
57 }

```

110





we're going to
Worlds!

| VEX IQ | | Qualification Rankings | | MATCH SCHEDULE | |
|--------|----------------------------------|------------------------|--------|----------------|--------|
| | | DEFAULT DIVISION | | | |
| Rank | Team # Name | Matches | Points | | |
| | | | | Q40 | 952S |
| | | | | | 11260 |
| | | | | Q41 | 10553A |
| | | | | | 9290B |
| | | | | Q42 | 11375E |
| | | | | | 952P |
| 1 | 10676E RES Rock and Roll Rockets | 3 | 184 | Q43 | 929H |
| 2 | 11260 The Blue Crabs | 3 | 182 | | 952G |
| 3 | 929D Hereford Zone Robotics | 3 | 181 | Q44 | 10158H |
| 4 | 10553A Margaret Brent | 3 | 174 | | 1154T |
| 5 | 11375E Robolions | 3 | 160 | Q45 | 11601I |
| 6 | 24K Super Sonic Sparks | 3 | 159 | Q46 | 1067I |
| 7 | 952P RMS Robotics | 3 | 157 | | 929C |
| 8 | 952J RMS Robotics | 3 | 155 | Q47 | 10158 |
| 9 | 952F RMS Robotics | 3 | 146 | Q48 | 11601 |
| 10 | 85571A BIA OWL's | 3 | 142 | | 9290 |
| 11 | 929C Hereford Zone Robotics | 3 | 141 | Q49 | 929C |
| | | | | | 24K |



last award please please please
be us!



IT IS US, Excellence award
!!!!

|||
Jasmine

I like that we were Maryland State Champions. I learned that there are many other ways to build the robots. I didn't like when we tried to shoot during the alliance and I didn't make it but we still won.



112



Destiny and Jasmine



Jasmine

Daily
reflection of states

113

1. ● It was awesome, there were a lot of surprises.
2. ● We won! excellence award
3. ● Were going to worlds!
4. ● it shows that it just depends who your partnered with for alliance



Are final alliance 1-7
which were with the
Super Sonic Sparks

114



Gabe getting robot ready



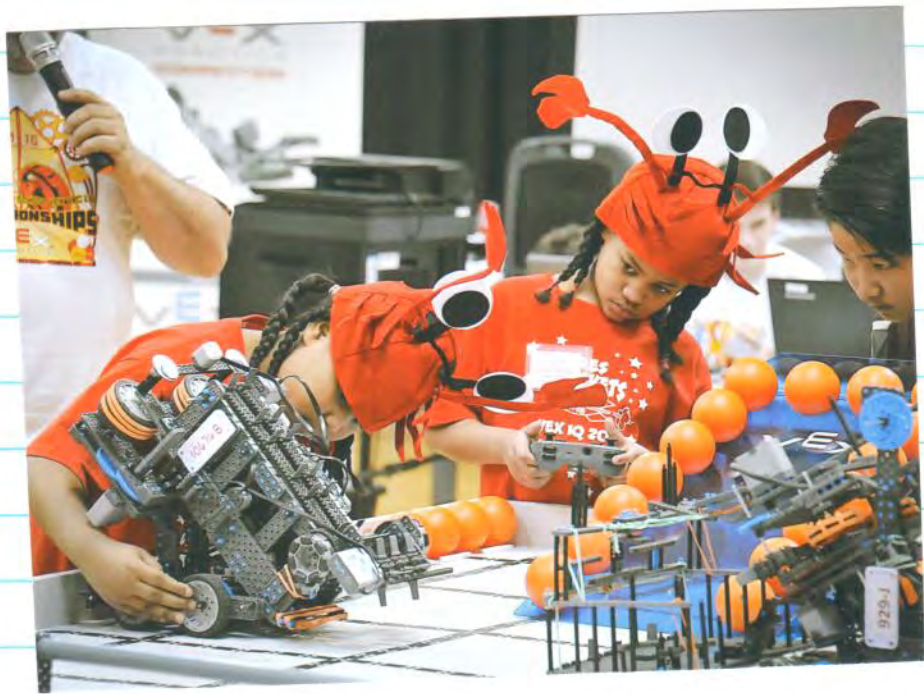
Gabe and Luis driving

I like that we won the Maryland State Excellence Award for Elementary. It was a lot of hard work but it paid off. The thing I learned was it takes a lot of hard work and team work to get to World Championship. I did not like that alliance match that we lost 1 point.





Bertiny Josemine



Josemine

Grace

What went well was that we weren't late for any matches and we were there at the right time.

What did not go well was that we were really stressed out at times and were moving around a lot.

I learned that competition is sometimes very stressful.

I do not want to be playing around inbetween matches because we might have a match soon or judges might be around.



119



All of us having fun

Connor

3-4-16

What I like is the packman robot helped us win 80 points. What I did not like was the program was turning to the right,



129



Conner and Jasmine

120



Conner and Jasmine

Problems and Solutions

The Maryland State Championship

What went wrong

1. Programming we didn't score our normal score it was really low.

- we only scored in the 20's.

= We only got 2 tries at programming skills and both times the robot went off the ramp to the right before making it to the top.

= The robot had never done this before.

Brainstorming

- Program is wrong?

- Placement in starting block was off?

- Robot wheelbase was loose?

- It might be the ramp - our ramp is used the states ramp was new.

Testing

122

- Ran program on our table and it worked perfect.
- Decided to run robot on school table - went off the side!
- Program is right.
- took wheel base apart on lot of white powder on the big washers so we changed to little washers, in effect now our turns in our programs are off.
- Programming skills team is 100% sure that the robot was lined up

Solution

- We decided to not make any changes till we test it on the camp at worlds.

Problems and Solutions Part 2

2. Robot Design

- The team talked about changing our robot design to see if we could get more points. We thought we could make our conveyor twice as big to get more points. We think it can get in the top 30. Our current design is best it's very sturdy.
- We think our STEM is awesome so we are going to focus most of our time with it. We have a few fieldtrips planned to the Calvert Marine Museum and to the University of Maryland Biological Lab to get some more information. We have two presentations with the St. Marys River Water Association before worlds so we will get plenty of time practicing with strangers. They are also holding a restoration project in April that

124

We will go help with.

125

Congratulating Bay Stewardship

RES Rock and Roll Rockets

April 7, 2016

In recognition of your exemplary work to foster stewardship of the Chesapeake Bay in partnership with the St. Mary's River Watershed Association.



Joe Anderson
Joe Anderson, President



St. Marys River watershed association
board of directors presentation

127.



Presenting to the team round show



Presenting to school teachers



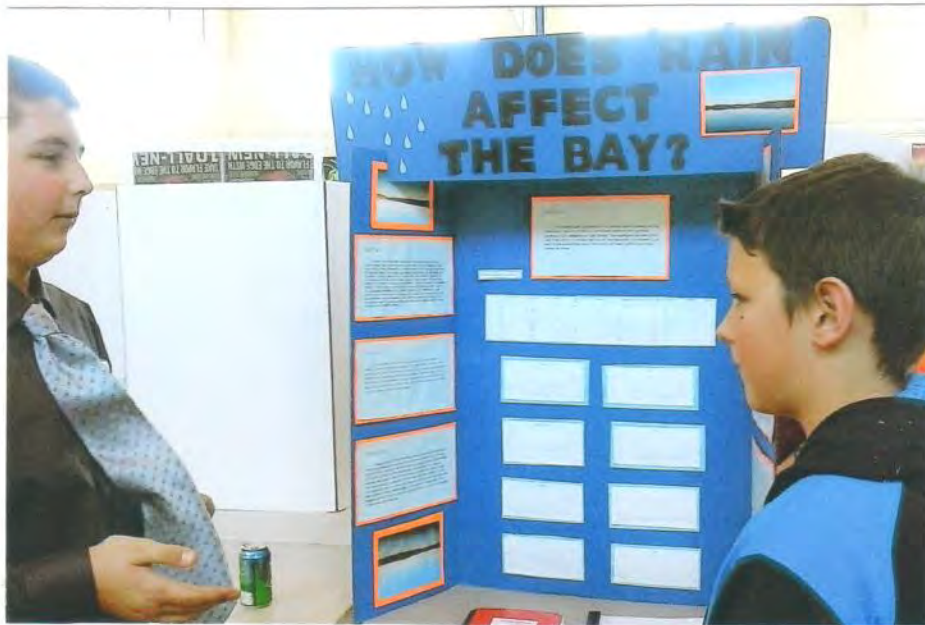
after presenting to
Mr. Luis and Ms. Meghan

128



we took a trip
to where the
Potomac and
Chesapeake meet

129



We went to a
science
fair and learned
about the bay



We went to
the Calvert
Marine Museum
and learned
about food webs
and how systems
are important.

calvert Marine
Museum



Calvert Marine
Museum Otter
tank



Conner and
Mr. Luis bagging
shells for
oysters

