Engineering Division

ENGINEERING NOTEBOOK

RES Rock and Roll Rockets

10676-B



Engineering Notebook



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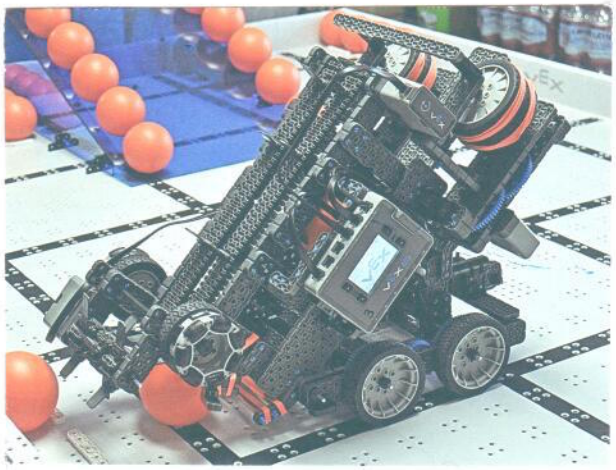
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Meet the team



10676B



Snapper



Jasmine



Grace

Gabe



Connor



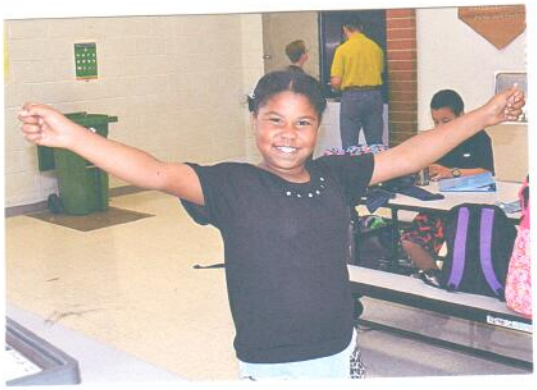
Destiny



Luis

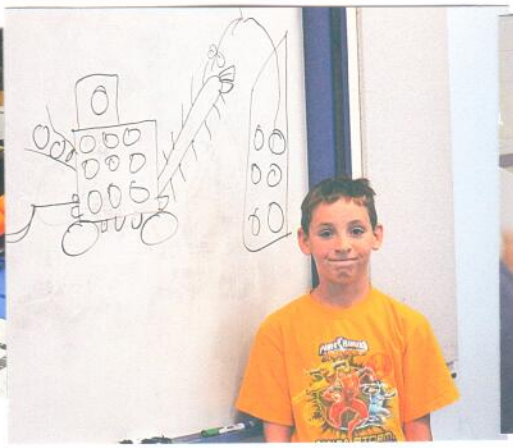




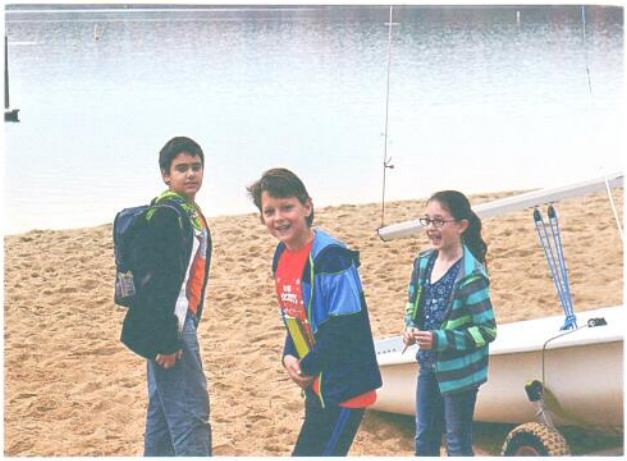












Save spot for if we ever get a Picture of Luis smiling! ☺

Date: 7/11/15 Meeting Type: Group / Individual

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

Meeting Topic: Robot Idea

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

Problems / Solutions / Comments:

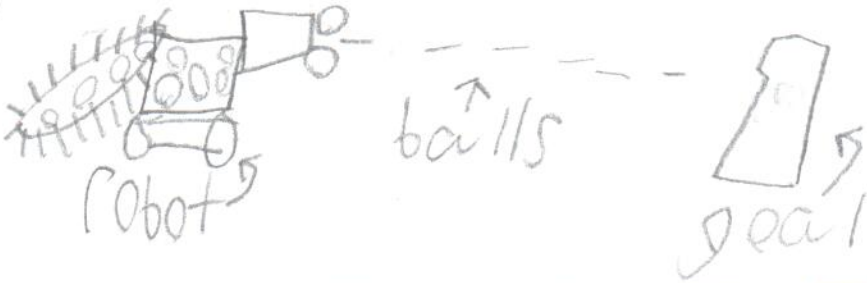
The problems were deciding wether or not we would use a claw/sc or use a conveyor belt. Comments we came to agreement. We decided to use a conveyor belt. → over

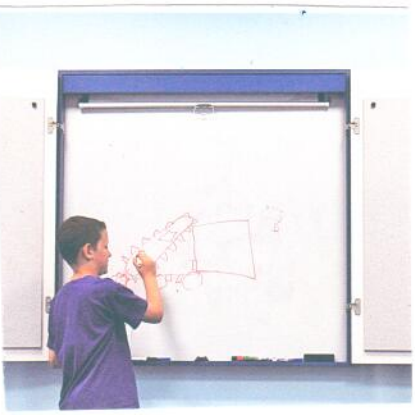
Plan for next meeting:

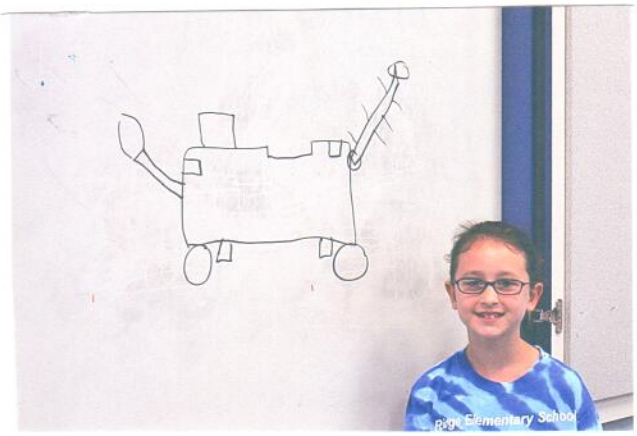
Start Building the Robot and modify the conveyor Belt

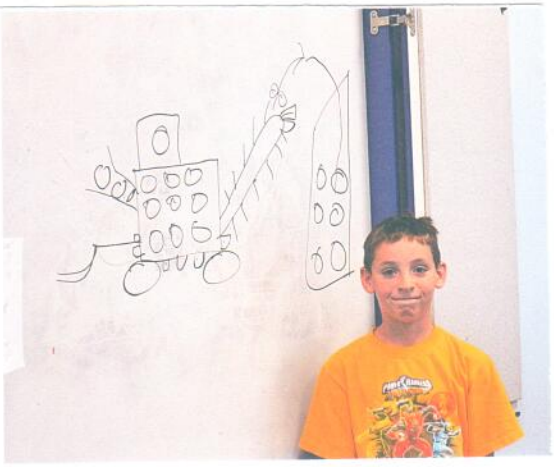
Next Meeting: 7/14/15 Entry by: Gabe and Grace.

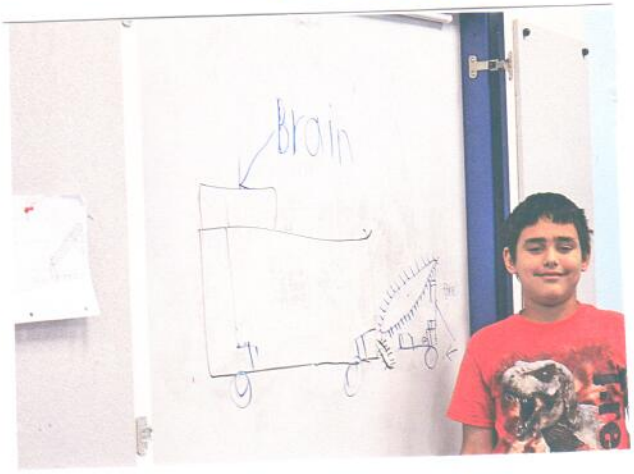
The conveyor belt will carry balls to the basket and the shooter will shoot the balls into the goal.















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.

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

Ethan's idea is to have basket that picks up balls and then the balls go up a long shaft so the balls get speed and go on a conveyer 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

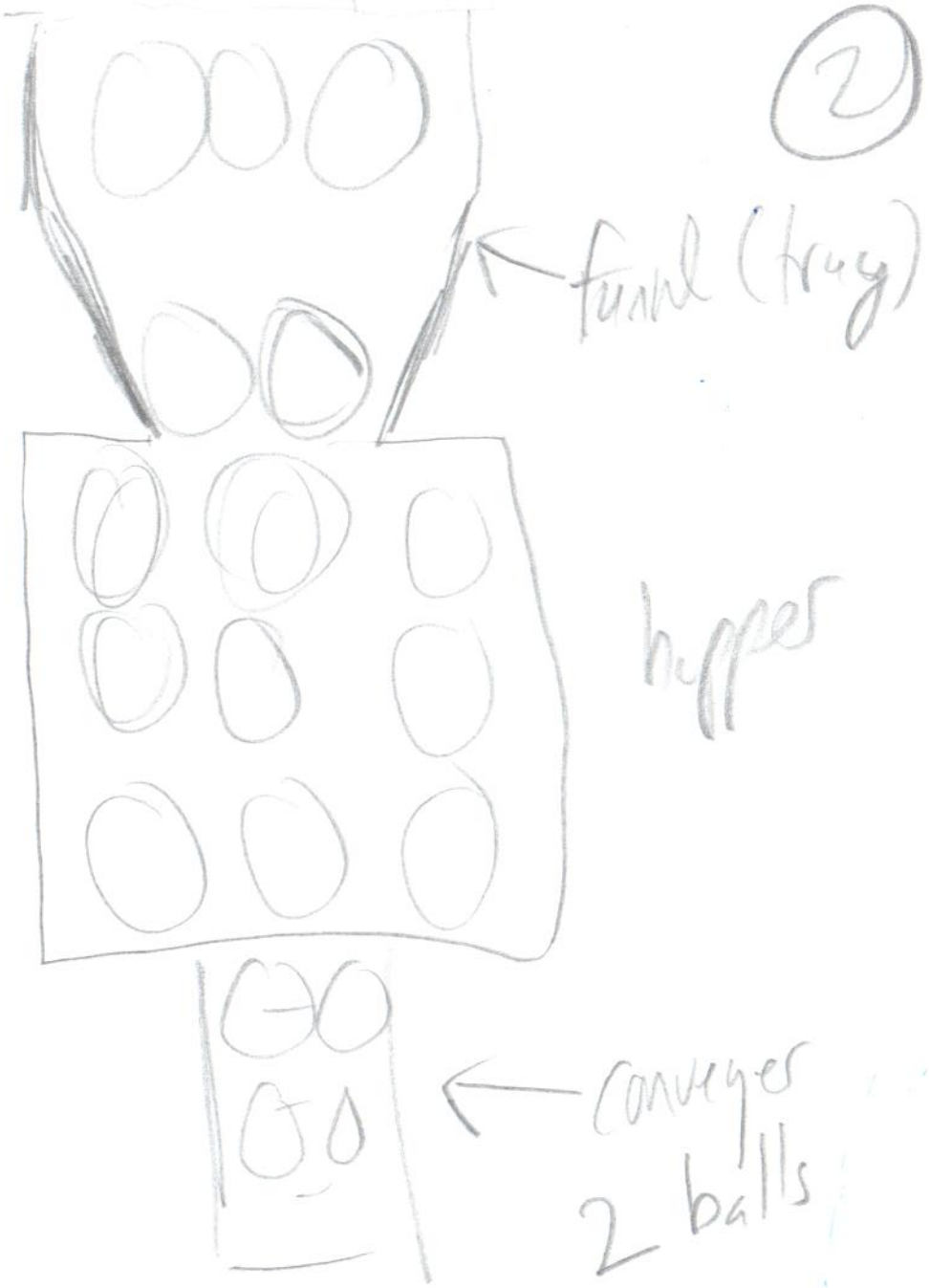
Conner's idea is to use a conveyor belt with wheels at the end to shoot balls into the goal the basket has tunnels that picks balls up and into the basket.

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

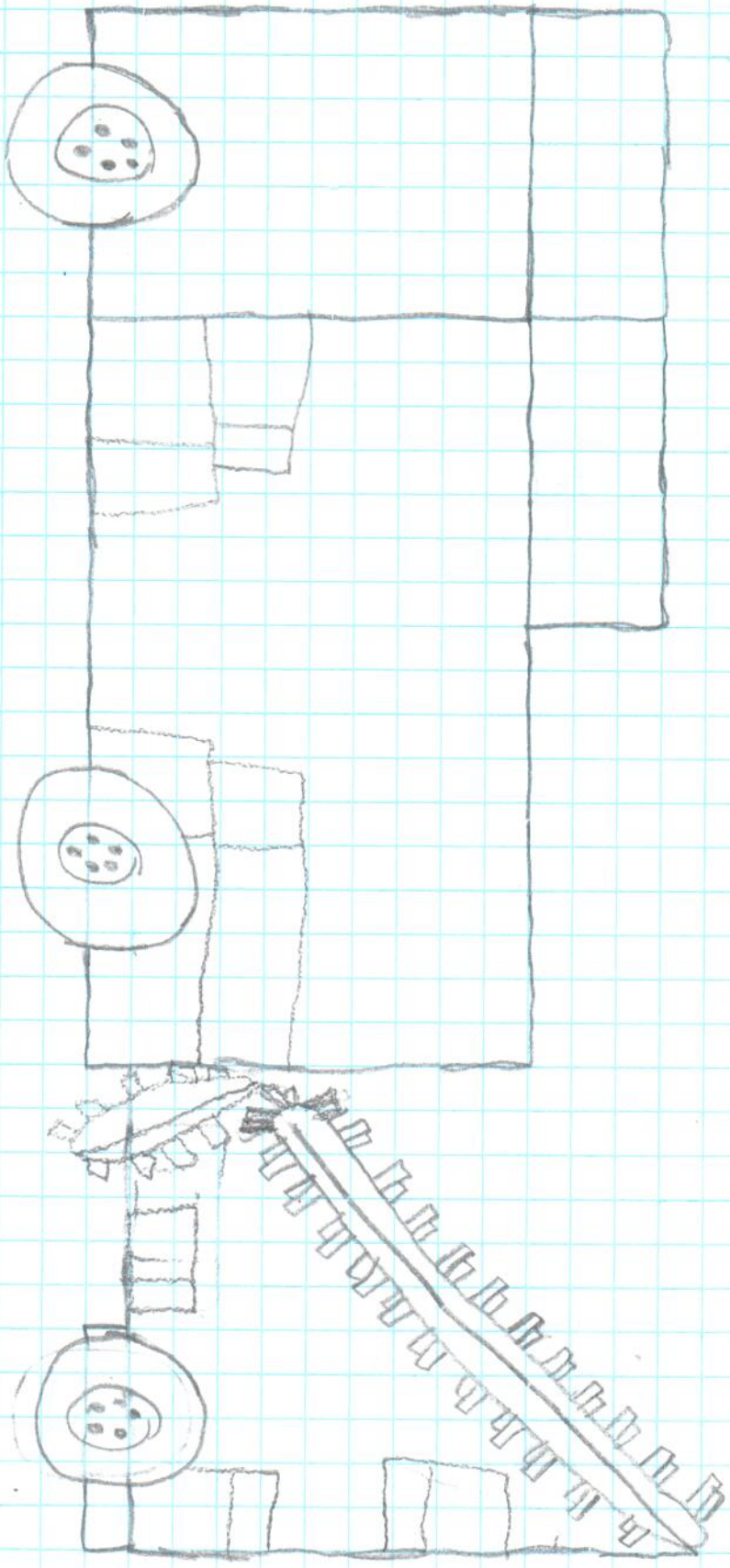
Eli used 2 wheels to shoot balls into the goal

CONCEPT

(2)



7

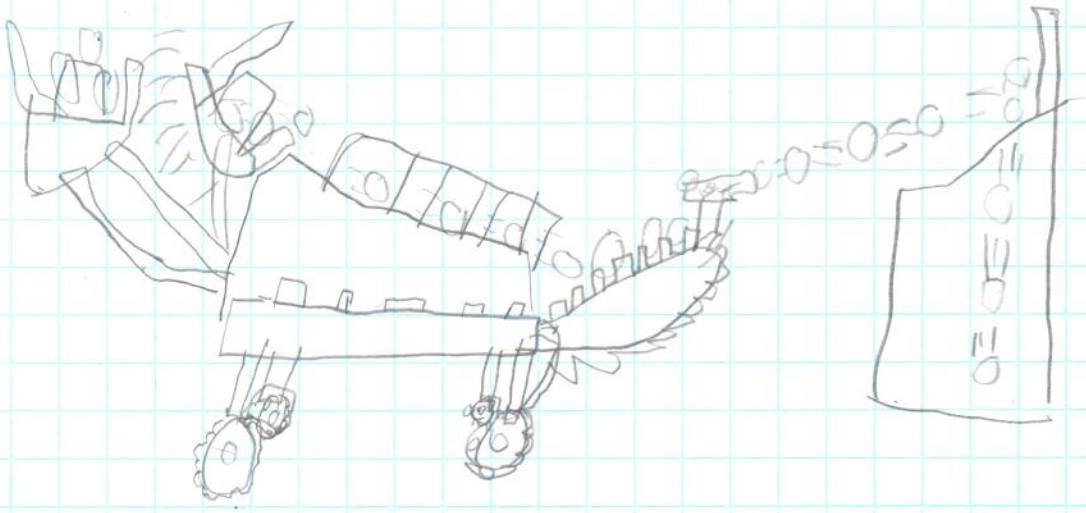


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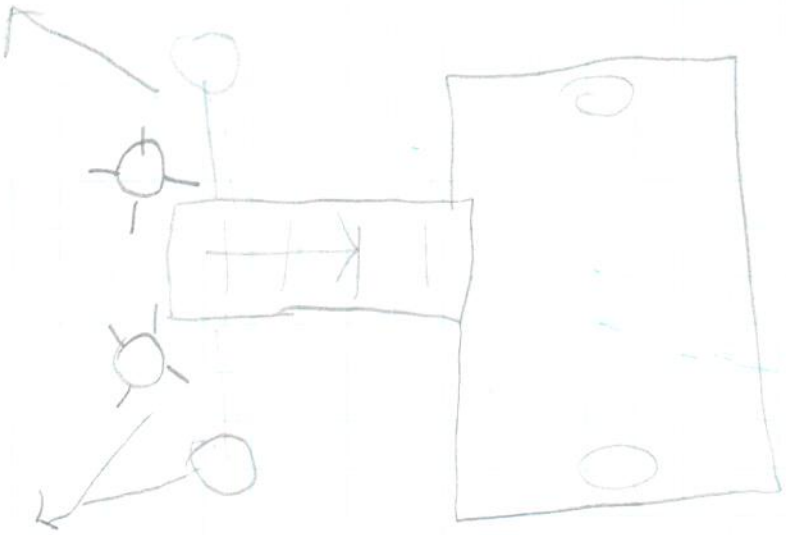
Ethan June 19

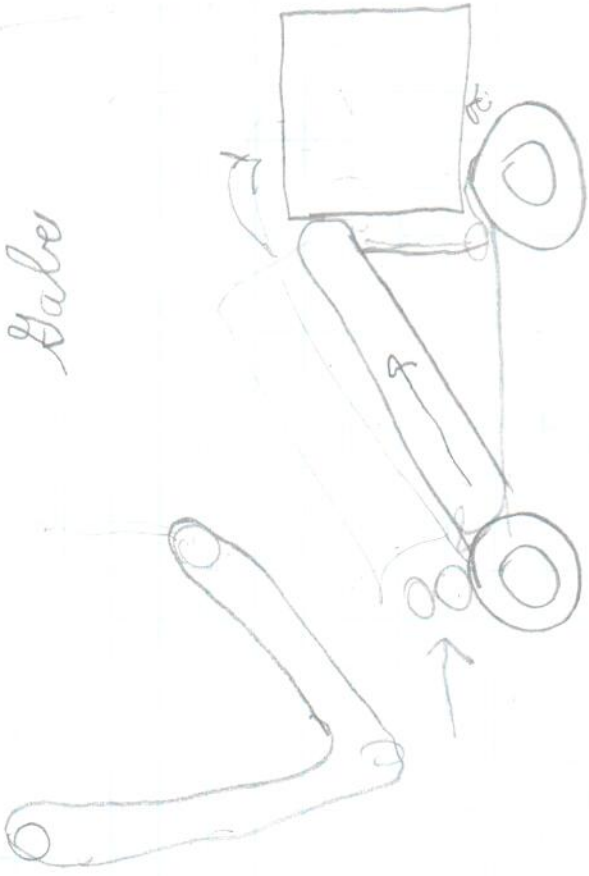


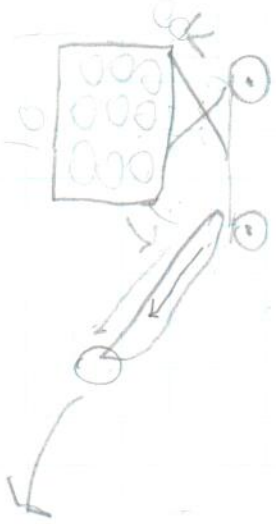


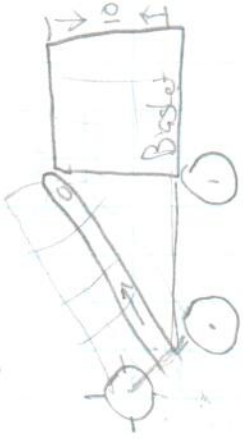
13by20

13by20by5



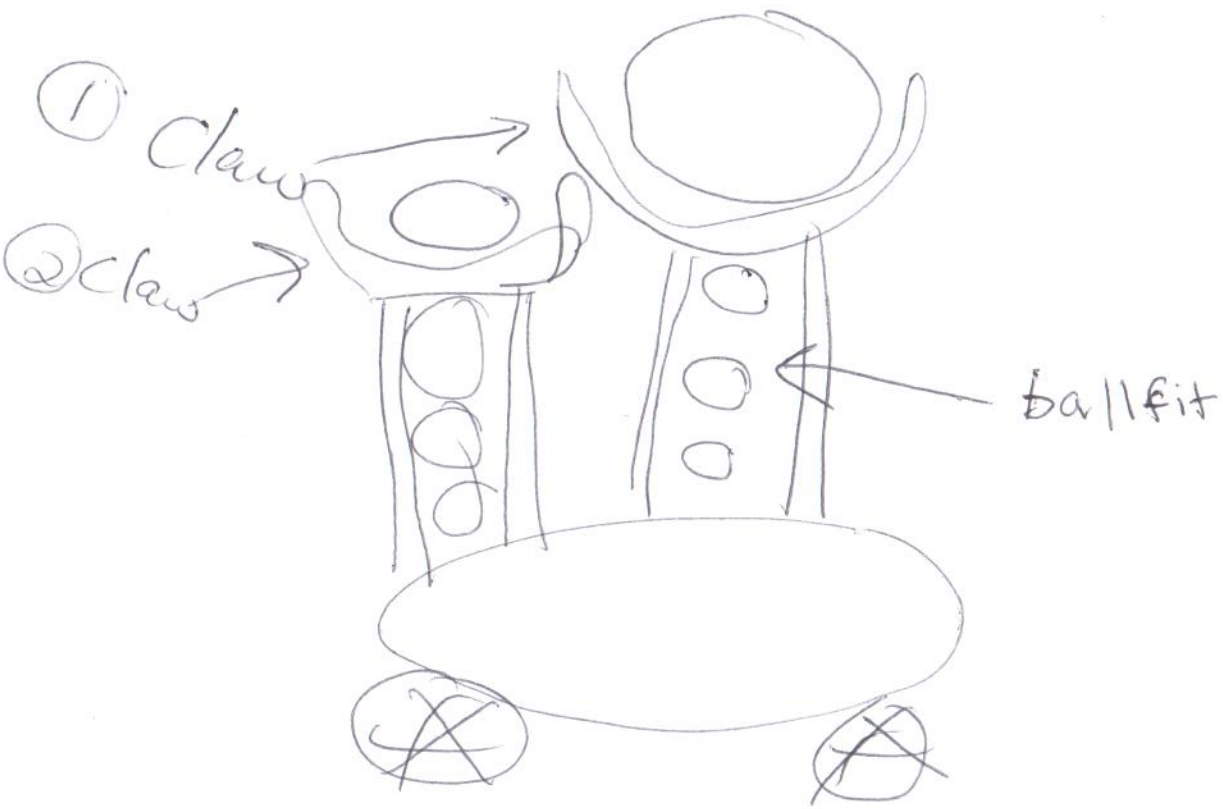





Basket



2 Wheels
2 Shooter
1 Feeder / Conveyer
1 Lift


① claw
② claw
ballfit



To 19 a/5a Build



Date: 7.19.15 **Meeting Type:** Group / Individual

Members Present: Connor, Luis, Gabe, Destinx

Meeting Topic: stem reasearch and build

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

Problems / Solutions / Comments:

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

We worked on the robots basket and Convexor belt. The conveyor belt is difficult to assemble. Pegs are annoying.

Plan for next meeting:

Keep building and select a topic sentence for Stem Reasearch

Next Meeting: 8.15.15 Entry by: Gabe



7.19.15. conveyor belt



7.19.15. basket

5/8/2015

Destiny
Grace
Connor
Ethan
Gabe



Steam Progege
How oysters Can clean
The Chespeke bay.
We will make a artifici
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 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: Continune to build the robot

Today's Goal: Continune 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:

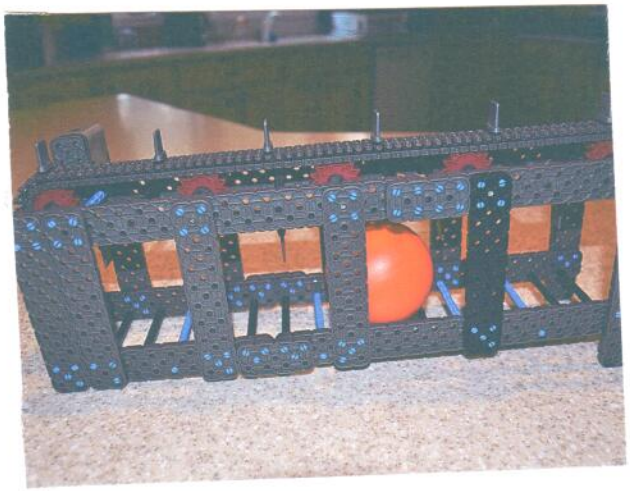
have wheel base done so we can attach to the conveyor belt and test it

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 , Densty

Members Present: Connor, Luis, Grace, Gabe,

Meeting Topic: _____

Today's Goal: Make wheel Base and Conveyor Belt

Problems / Solutions / Comments:

The wheel base could'nt 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 sprocket

26

Date: 9.11.15. **Meeting Type:** Group / Individual

Members Present: Destiny, Gabe, Grace, Luis, Conn
Ethan

Meeting Topic: Finish building conveyor and basket

Today's Goal: get it finished! and start programing.

Problems / Solutions / Comments:

Coach went over basic programing with us.

Destiny finished the basket

Pros = holds 30 balls, is sturdy

Cons = not all the balls go out.

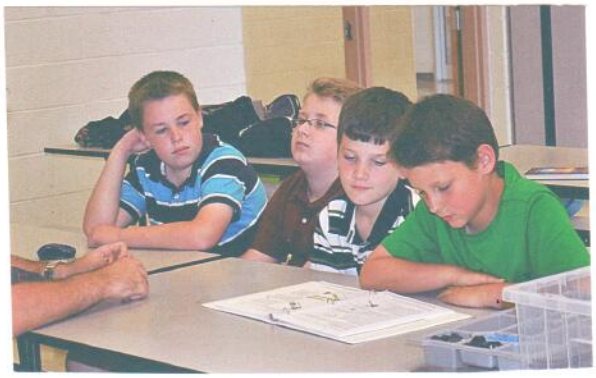
were going to adjust the size of exit → ove

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 programing





building
Wheelbase



basket finished



testing basket

Date: 9/18/15 **Meeting Type:** Group / Individual

Members Present: Destiny Gabe Luis connor Ethan Grace

Meeting Topic: Get conveyor working

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: Gabe 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 basket, It worked. But sometimes some of the balls still get stuck.

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 be cause 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

11. 6.15



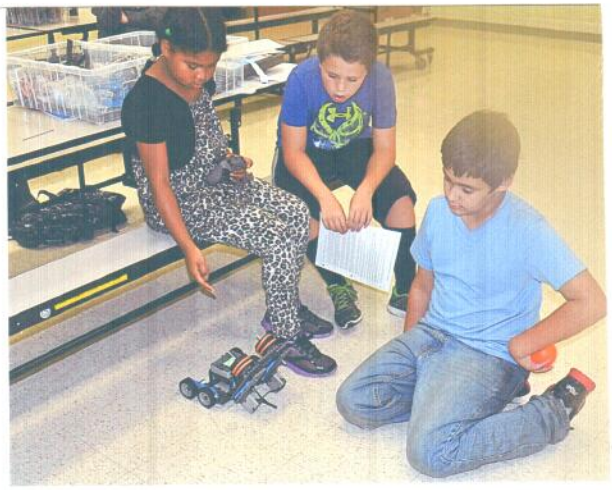
Building shooter. We used compound gearing to make it go super fast.

gearing = 60 to 12
60 to 12
25/11



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 Luis

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 useing a metal axle and the wheels didn't bend out. we put the wheelbase an with rubber stoppers on it. We have a robot.

Plan for next meeting:

Start driving and programming.

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





figuring out new wheelbase



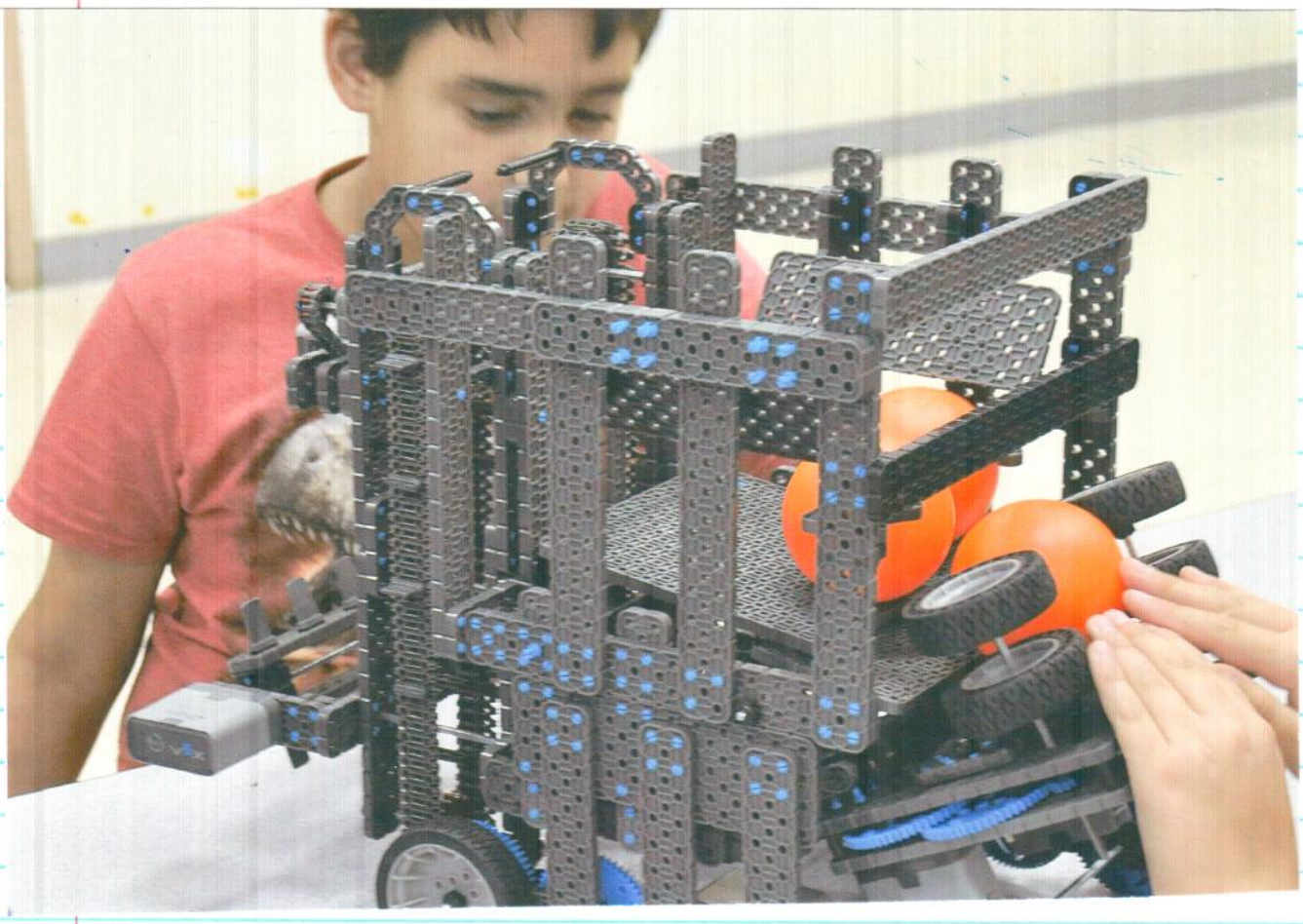
We used long solid metal axels from 1 wheel to the other wheel and it made our robot super sturdy.



Snapper is finished! yeah!

11. 13. 15.

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 →

spin very fast because of the compound gearing, 60/12 (5/1) and another 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 wont 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 recycle 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:

Duhh! 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:

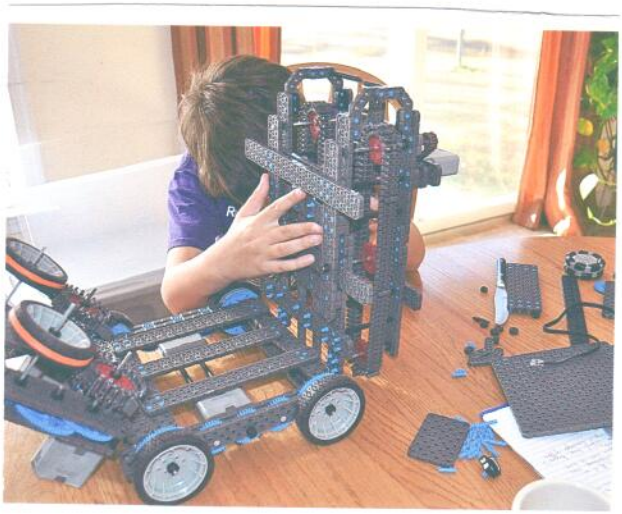
Grace is coming to build the basket, then we can test it again

Next Meeting: _____ Entry by: Gabe

11. 25. 15.



Changed long metal axels and gave each wheel it's own axel. Changes 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 wheelbase added flipper wheels infront 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.

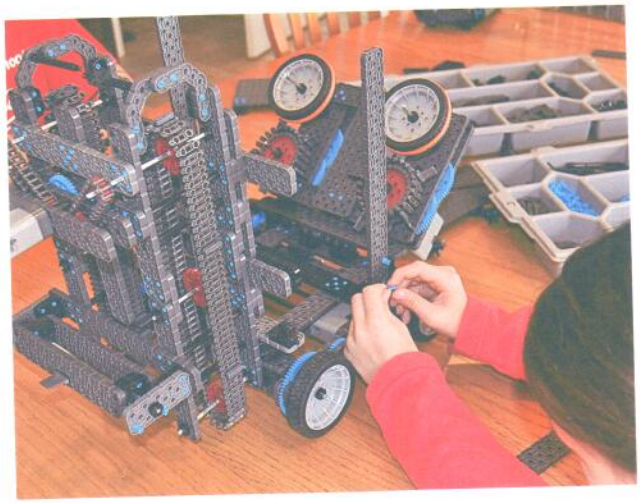
Plan for next meeting:

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

Next Meeting: _____ Entry by: Gabe



Us making basket



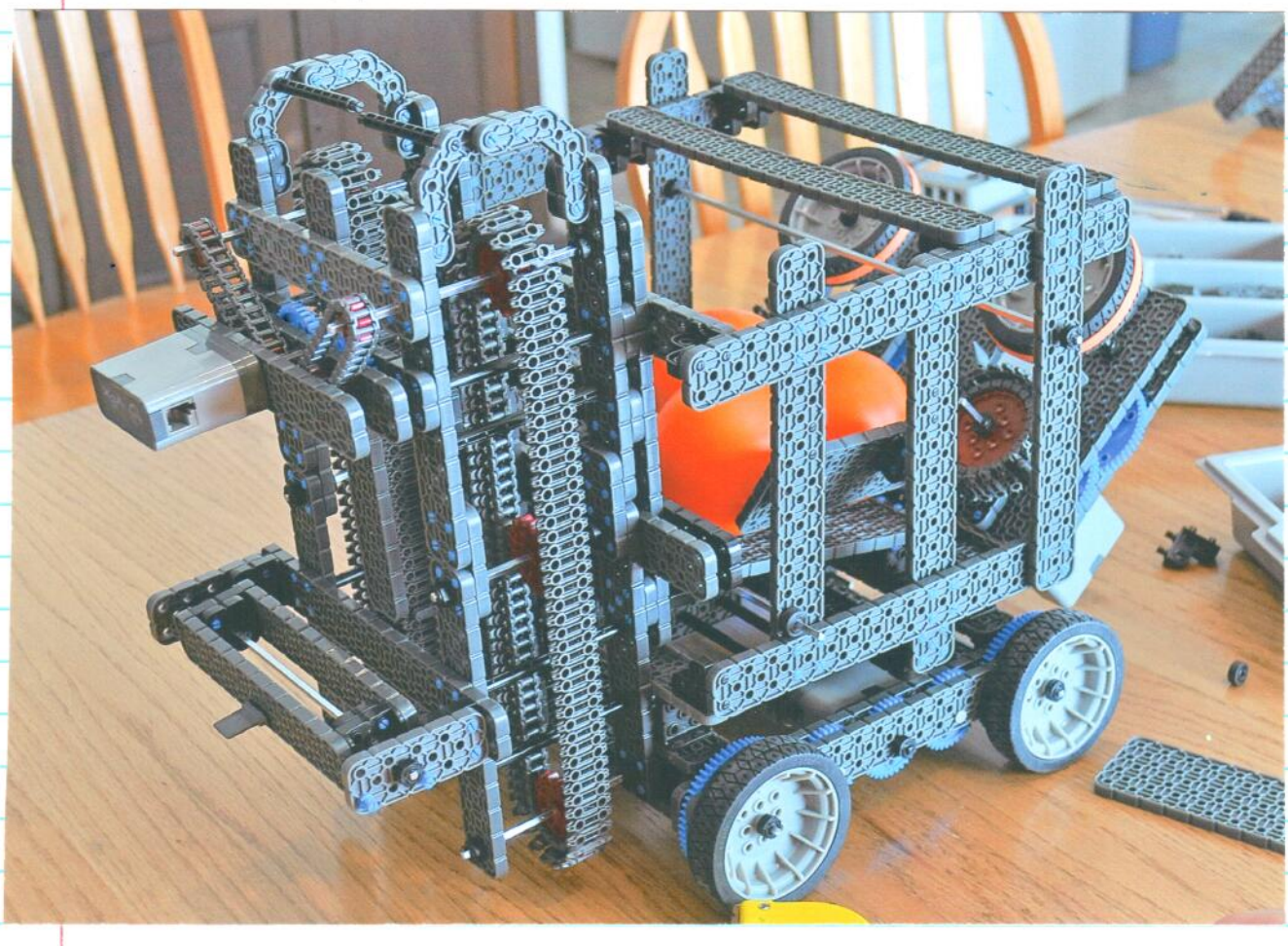
making basket



and fixing the flippers on the elevator

11.27.15

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 couldnt go up the ramp and it couldnt turn. We're going to fix the robot by taking off 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 eachother and are 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

cacaiit! 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 scrub.

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 smaller conveyor. No basket.



raised shooter so balls would go in to the goal.

Date: 12.11.15 **Meeting Type:** Group / Individual

Members Present: Destiny Gabe Grace Luis

Meeting Topic: remake robot a workon stem

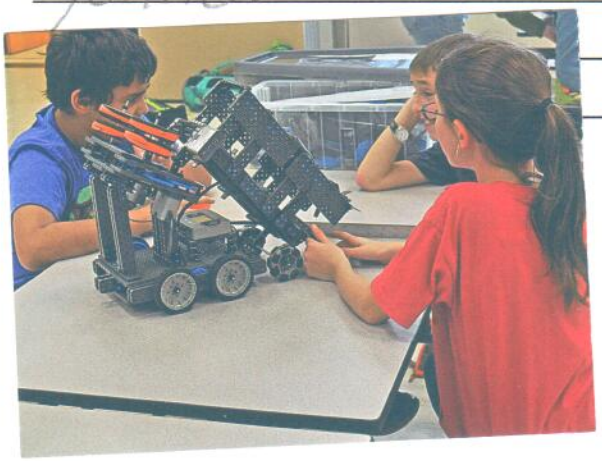
Today's Goal: make questions for stem (about 20) and make robot compition ready

Problems / Solutions / Comments:

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

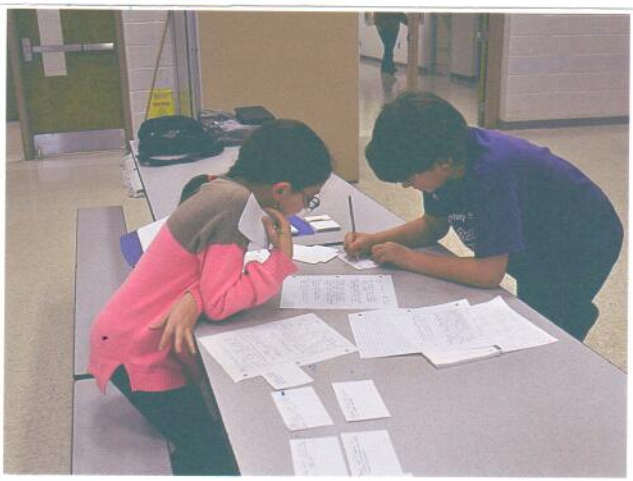
Plan for next meeting:

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



Entry by: Gabe

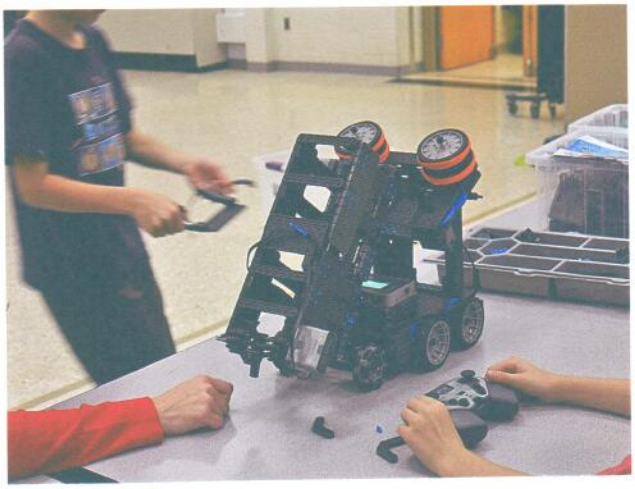
12.16.15



Making flash cards for STEM.

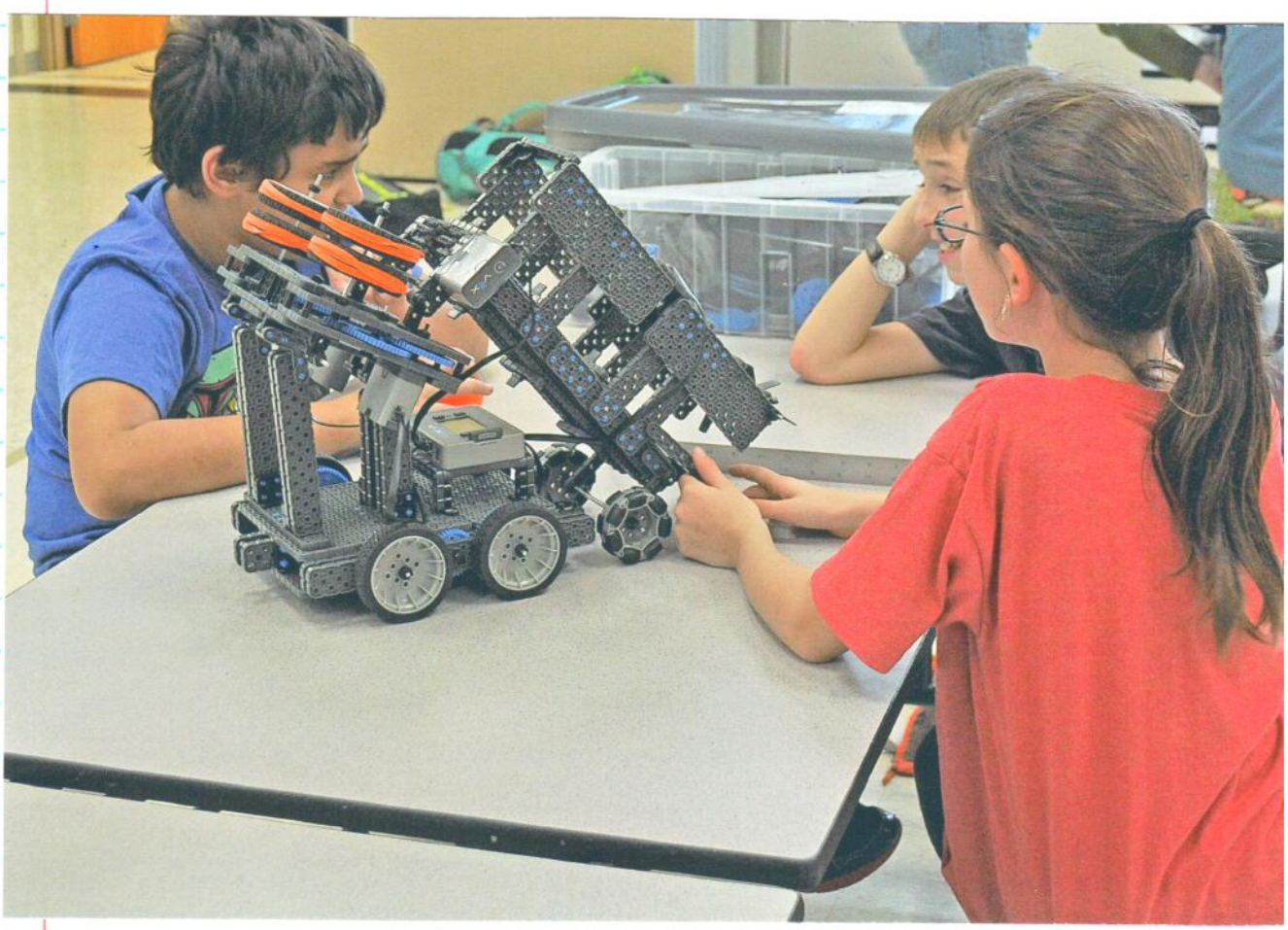


attaching conveyor to frame



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 packed. Since it couldn't do this, we decided to 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

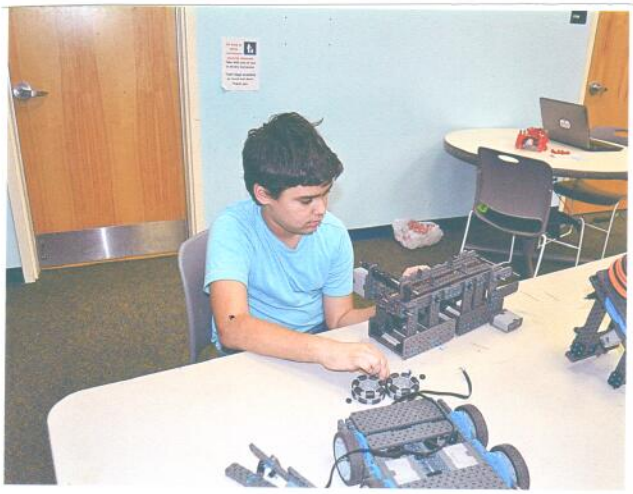
Meeting Topic: driving practice and more build

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

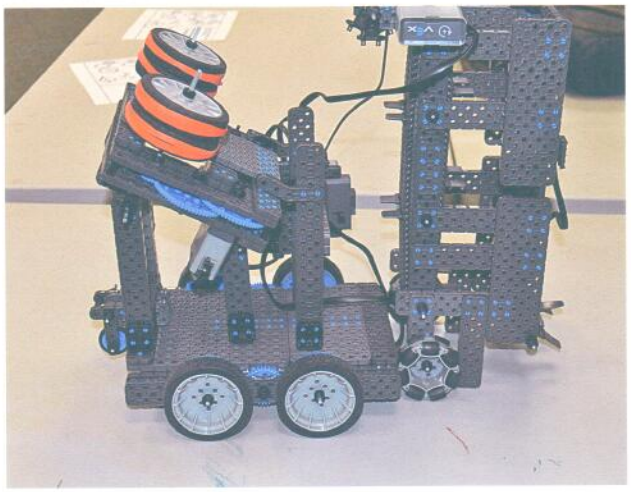
Problems / Solutions / Comments:
we broke our robot
souloution is get new design
our robot, broke into 2
fifteen pieces 1. conveyor
2. shooter.

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 whol 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 seperate pieces. we flipped the conveyer so the flippers could grab the balls and pull it in we atached 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

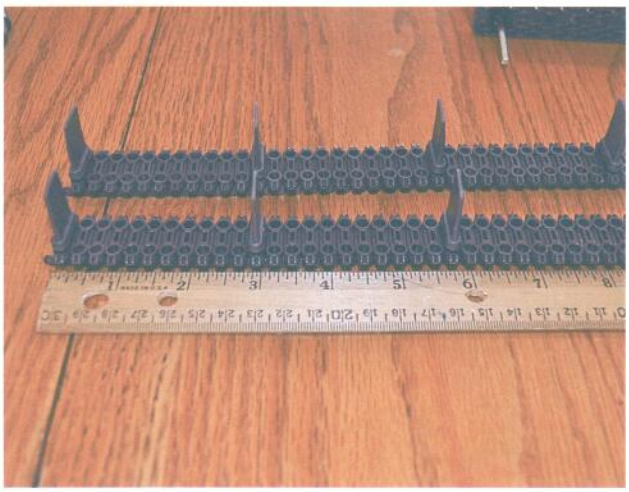
Next Meeting: 1.3.16 Entry by: Dale

we atached the snatcher to the front of the convexer. Then we tested it. The robot drove well. And the shooters are very strong but have to be at full speed.

Problems =

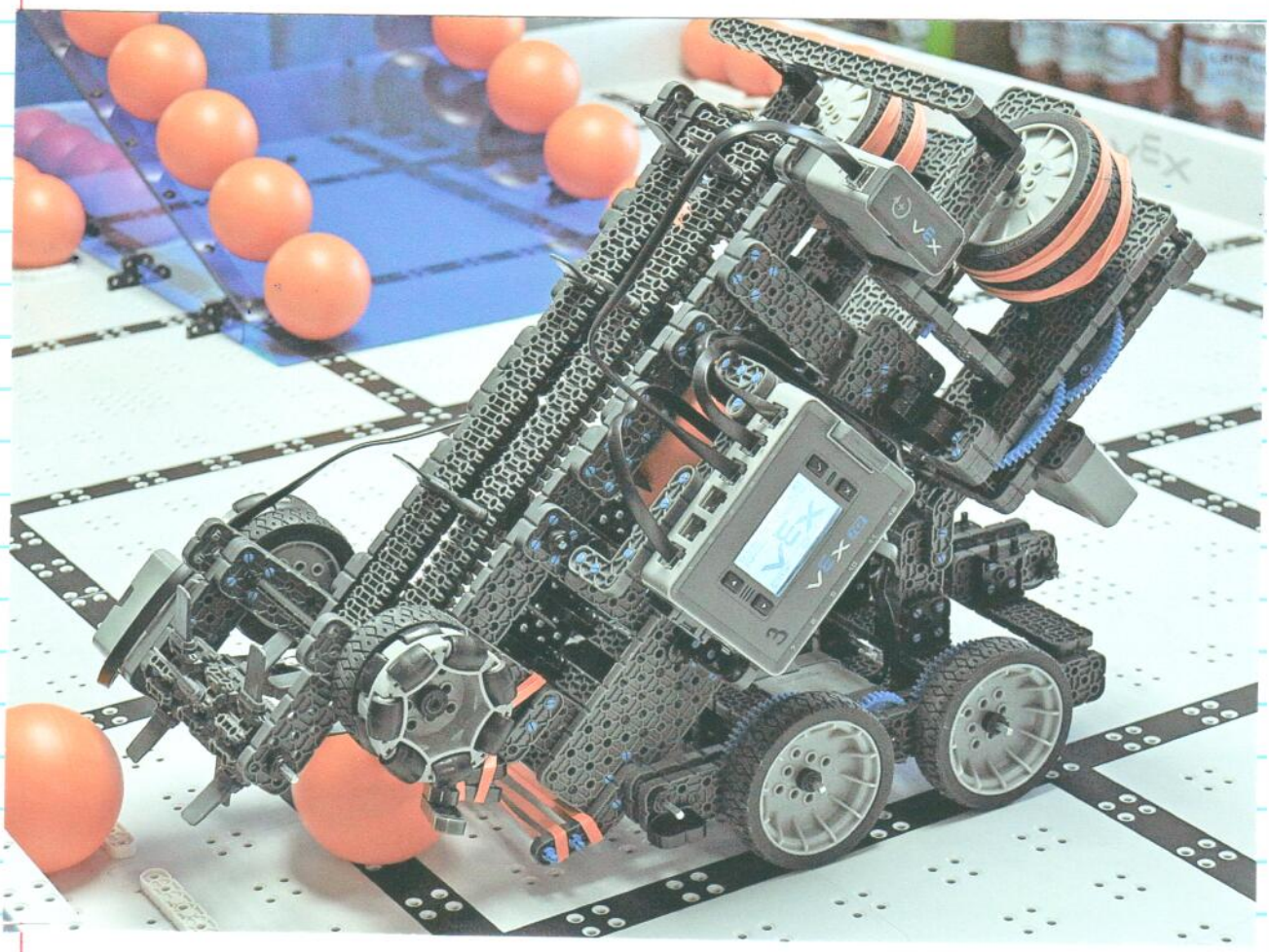
1. it tried to flip over backwards. we added wheels to the front to add weight

2. Balls had a hard time getting in the convey or. 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 it's 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 shooters with a long metal axel. We added a snatcher to the front to get the balls into the conveyor. We added wheels to the front so it wouldnt 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 beams 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 Reasearch

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

Problems / Solutions / Comments:

When we practiced driving it took us awile 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 compotition our best score was 34 pts. We finished the draft for our STEM reasearch board. Our topic is Saving the bay we have →

Plan for next meeting:

Our plan for next meeting is, more driving practice pragramming and STEM reaserch

Next Meeting: _____ Entry by: Grace

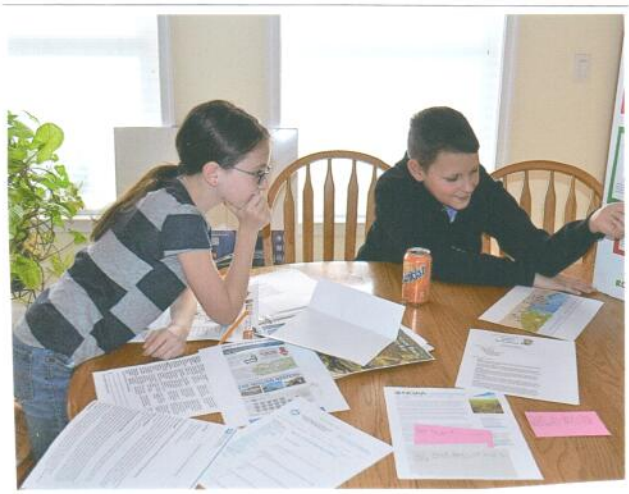
real pictures from Mr. Lewis to go with our display.



Ready to start driving!



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



draft for our stem reasearch board.

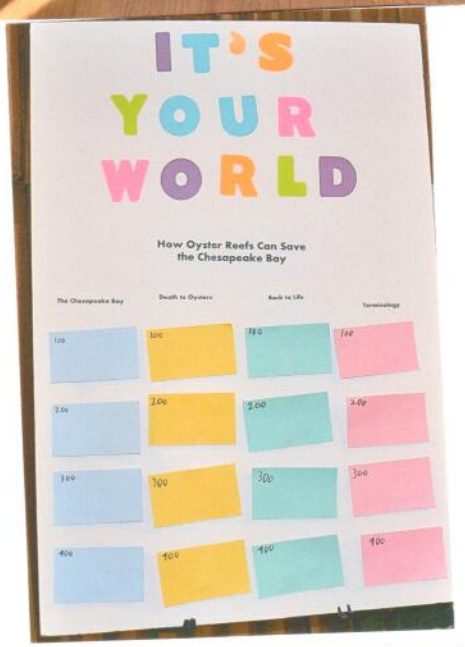
STEM Reasearch



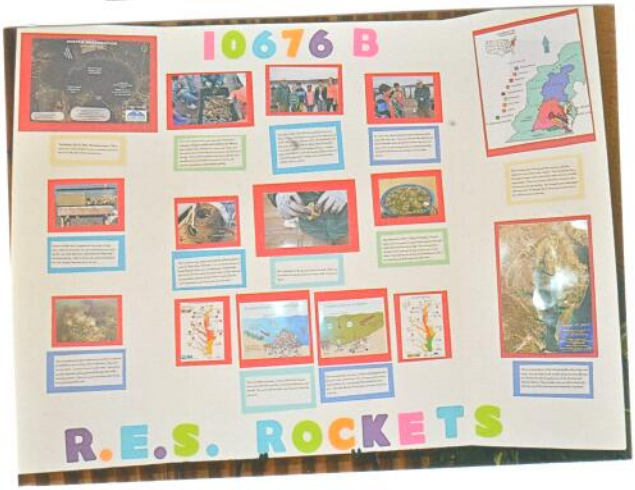














First STEM Practice



Jepordy Fun time.



driving practice



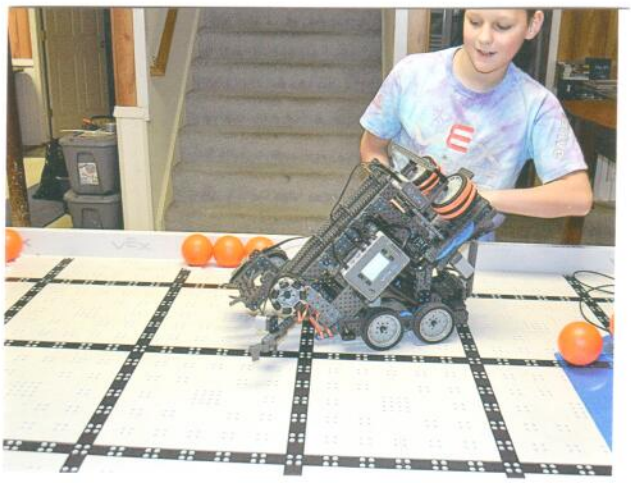










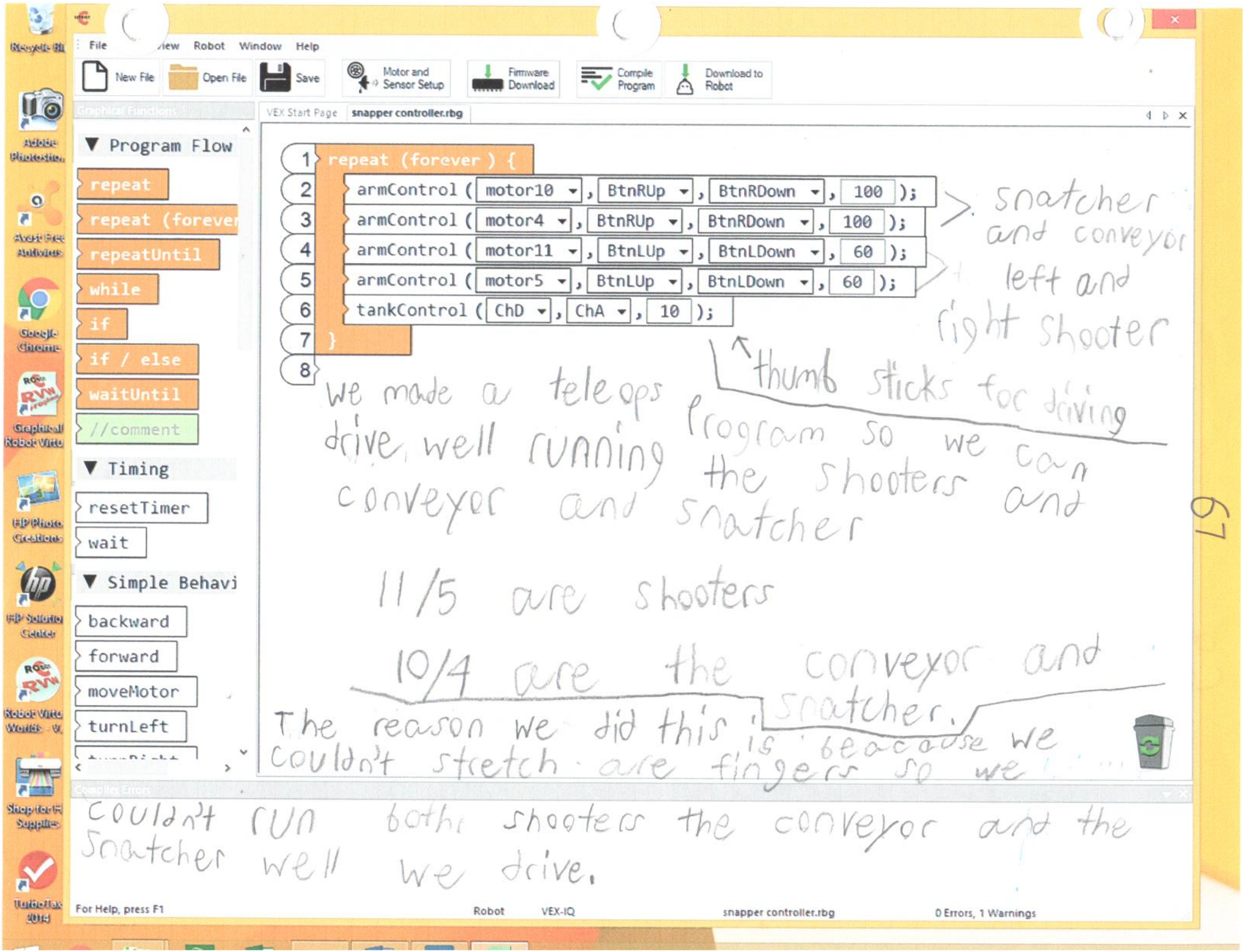











File
Robot
Window
Help
New File
Open File
Save
Motor and Sensor Setup
Firmware Download
Compile Program
Download to Robot
VEX Start Page
snapper controller.rbg
▼ Program Flow
repeat
repeat (forever
repeatUntil
while
if
if / else
waitUntil
//comment
▼ Timing
resetTimer
wait
▼ Simple Behavi
backward
forward
moveMotor
turnLeft
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
we made a teleops program so we can drive, well running the shooters and conveyor and snatcher
11/5 are shooters
10/4 are the conveyor and snatcher.
The reason we did this is because we couldn't stretch are fingers so we
Compiler Errors
couldn't run both shooters the conveyor and the snatcher well we drive.
For Help, press F1
Robot
VEX-IQ
snapper controller.rbg
0 Errors, 1 Warnings

File Edit View Window Help

New File | Save | Motor and Sensor Setup | Firmware Download | Compile Program | ...nload to ...bot

Graphical Functions

VEX Start Page | snapper controller.rbg

▼ 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

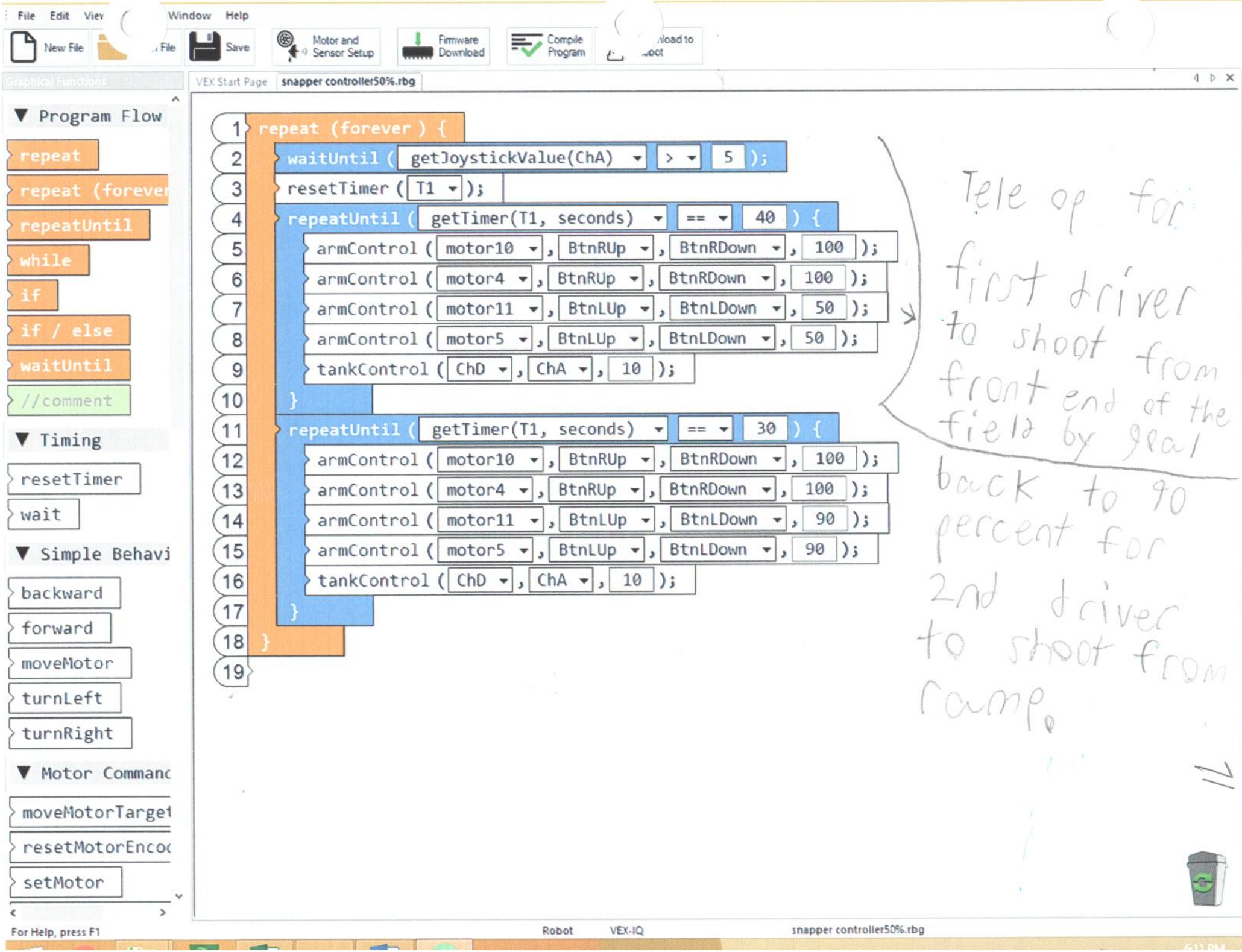
```
1 repeat (forever ) {
2   armControl ( motor10 , BtnRUp , BtnRDown , 100 );
3   armControl ( motor4 , BtnRUp , BtnRDown , 100 );
4   armControl ( motor11 , BtnLUp , BtnLDown , 75 );
5   armControl ( motor5 , BtnLUp , BtnLDown , 75 );
6   tankControl ( ChD , ChA , 10 );
7 }
8
```

Changed shooter speed to 75 & 50 it can shoot from ramp

9

For Help, press F1 | Robot VEX-IQ | snapper controller.rbg | No compile errors

6:53 PM


File Edit Viev Window Help
New File
Save
Motor and Sensor Setup
Firmware Download
Compile Program
VEX Start Page
snapper controller50%.rbg
▼ 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
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.
For Help, press F1
Robot
VEX-IQ
snapper controller50%.rbg

File Edit View Window Help

New File | Save | Motor and Sensor Setup | Firmware Download | Compile Program

Graphical Functions

VEX Start Page | Ramp only.rbg

▼ 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

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

);

Motors and Sensors Setup

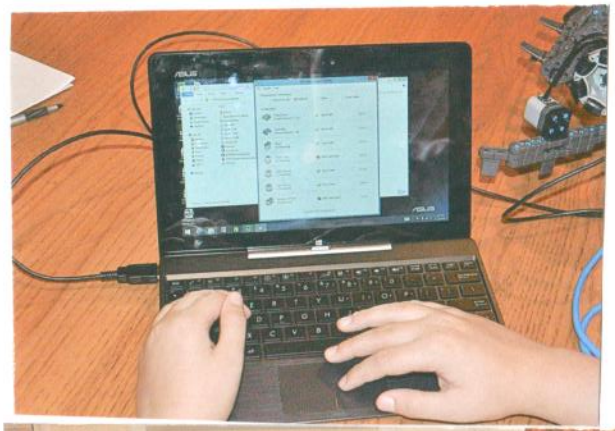
Standard Models | Datalogging | Motors | Devices

Port	Name	Type	Reversed	Drive Motor Side
motor1	leftMotor	VEX IQ Motor	☑	Left
motor2		No motor		
motor3		No motor		
motor4	conveyor	VEX IQ Motor	☑	None
motor5	rshooter	VEX IQ Motor	☐	None
motor6	rightMotor	VEX IQ Motor	☐	Right
motor7		No motor		
motor8		No motor		
motor9		No motor		
motor10	snatcher	VEX IQ Motor	☐	None
motor11	lshooter	VEX IQ Motor	☑	None
motor12		No motor		

OK | Cancel | Apply | Help

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

For Help, press F1 | Robot | VEX-IQ | Ramp only.rbg | 0 Errors, 1 Warnings



downloading software, updating brain and sensors and the controler



We started a new file called Ramp Only!

And we setup our sensors and motors.



We figured out how much 1 roatation is.

It is 6 inches.

date 1.3.16

entry by Gage

now we can start programing.

YEAH!

File Edit View Window Help

New File | Save | Motor and Sensor Setup | Firmware Download | Compile Program

VEX Start Page | Ramp only.rbg

▼ 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

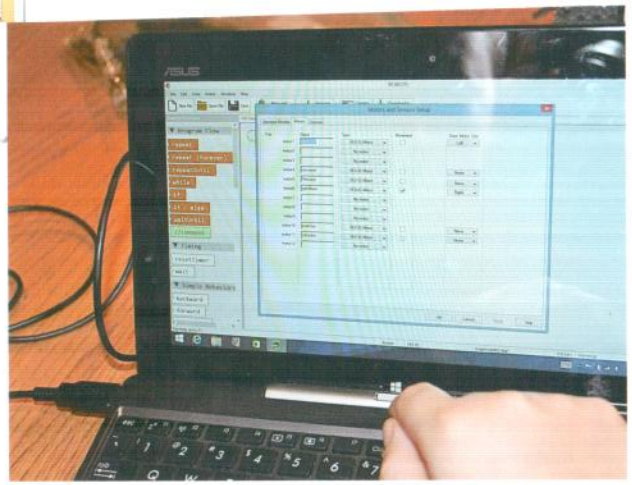
```
1 resetGyro ( gyro );
2 forward ( 2.75 , rotations , 50 );
```

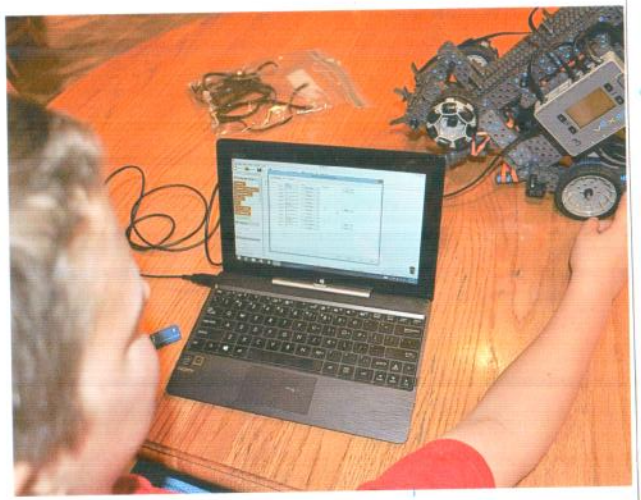
Motors and Sensors Setup

Standard Models | Datalogging | Motors | Devices

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

OK





For Help, press F1 | Robot | VEX-IQ | Ramp only.rbg | 0 Errors, 1 Warnings

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.

77

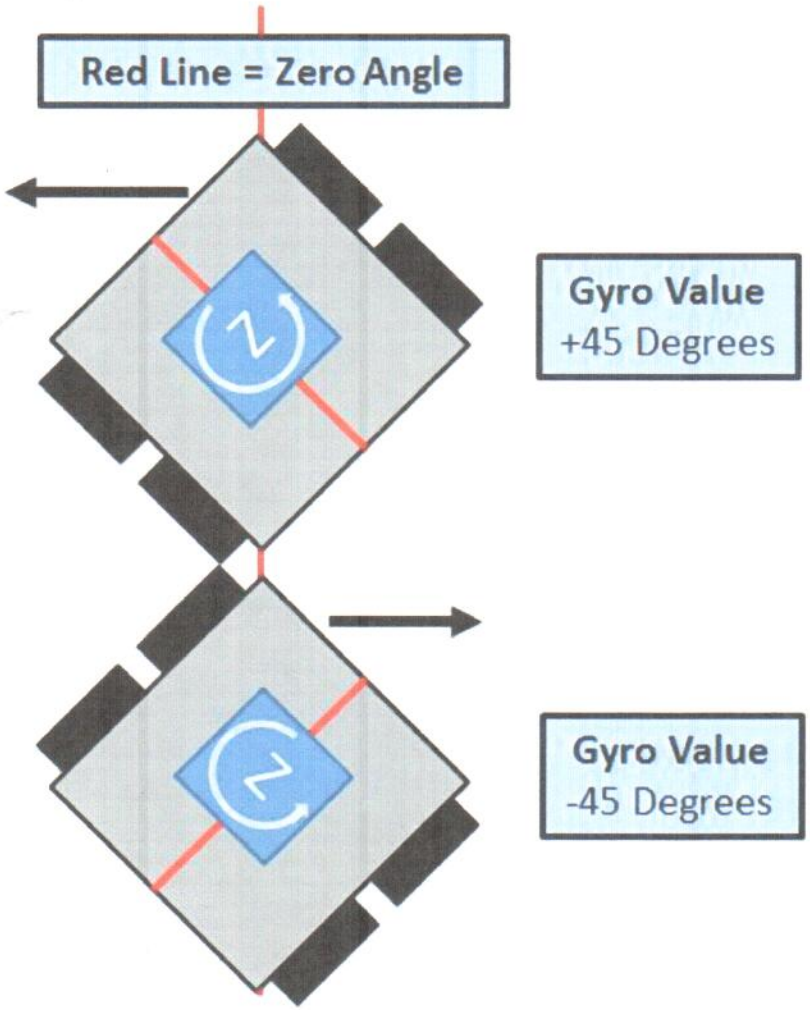
From: Charles Skinner <caskinner@smcps.org>
To: slcannavo <slcannavo@aol.com>
Subject: Re: Help me PLEASE!
Date: Fri, Jan 8, 2016 5:18 pm

Hi Sarah,

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

You do need do 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);
}
```

File View Robot Window Help

New File | Open File | Save | Motor and Sensor Setup | Firmware Download | Compile Program | Download to Robot

VEX Start Page | Ramp only.rbg

▼ Program Flow

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

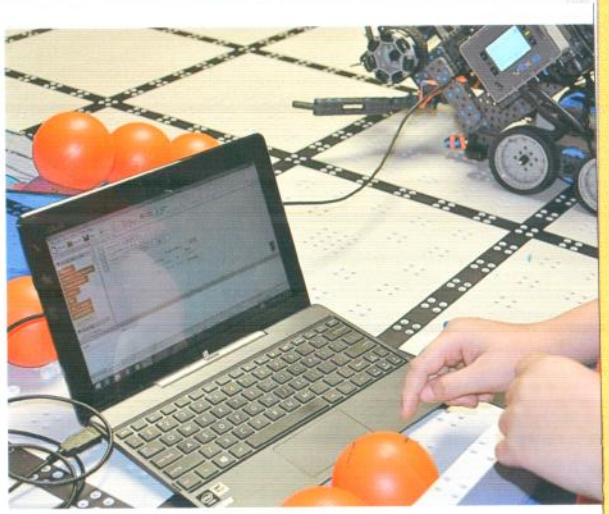
▼ Timing

resetTimer
wait

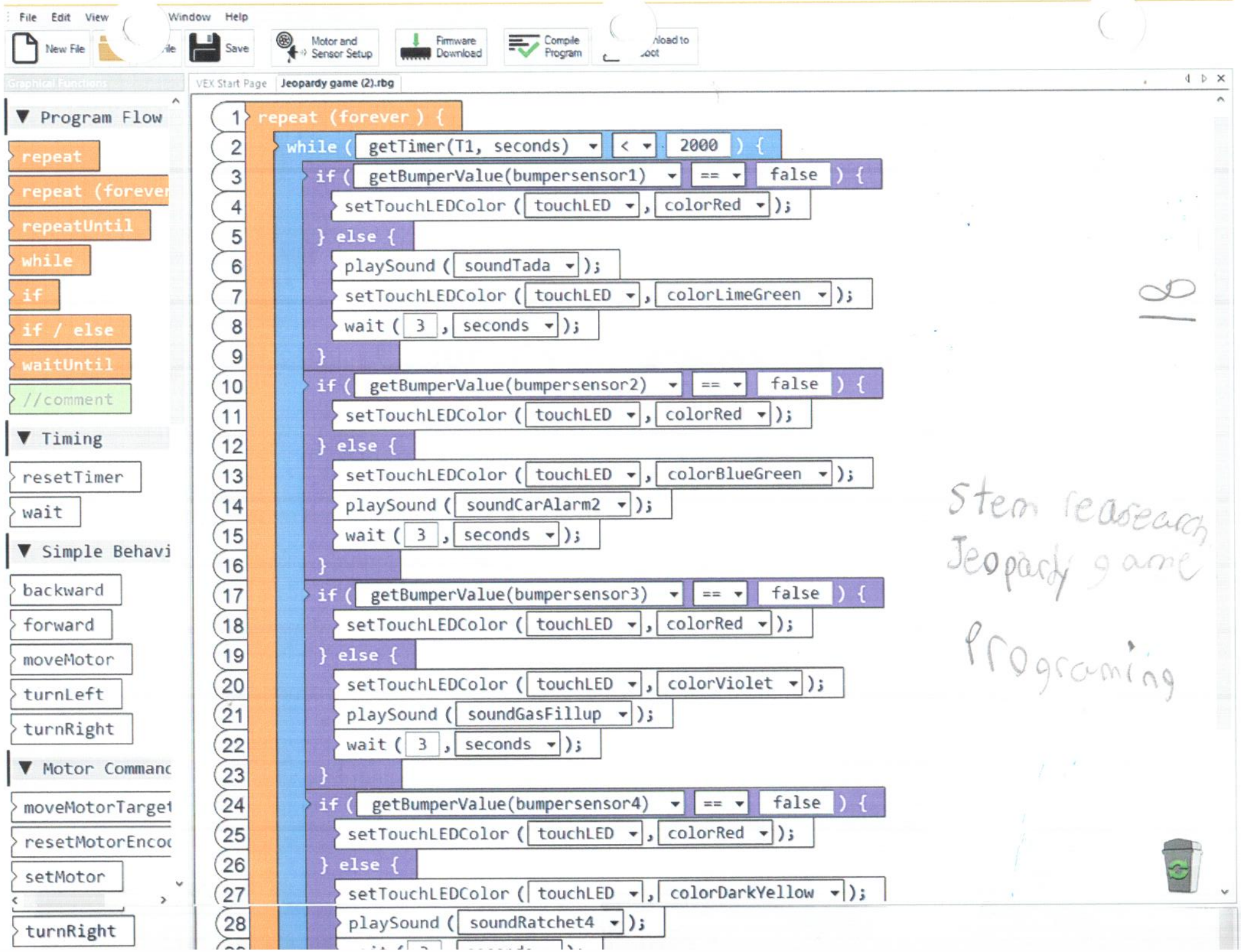
▼ Simple Behavi

backward
forward
moveMotor
turnLeft

```
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
```

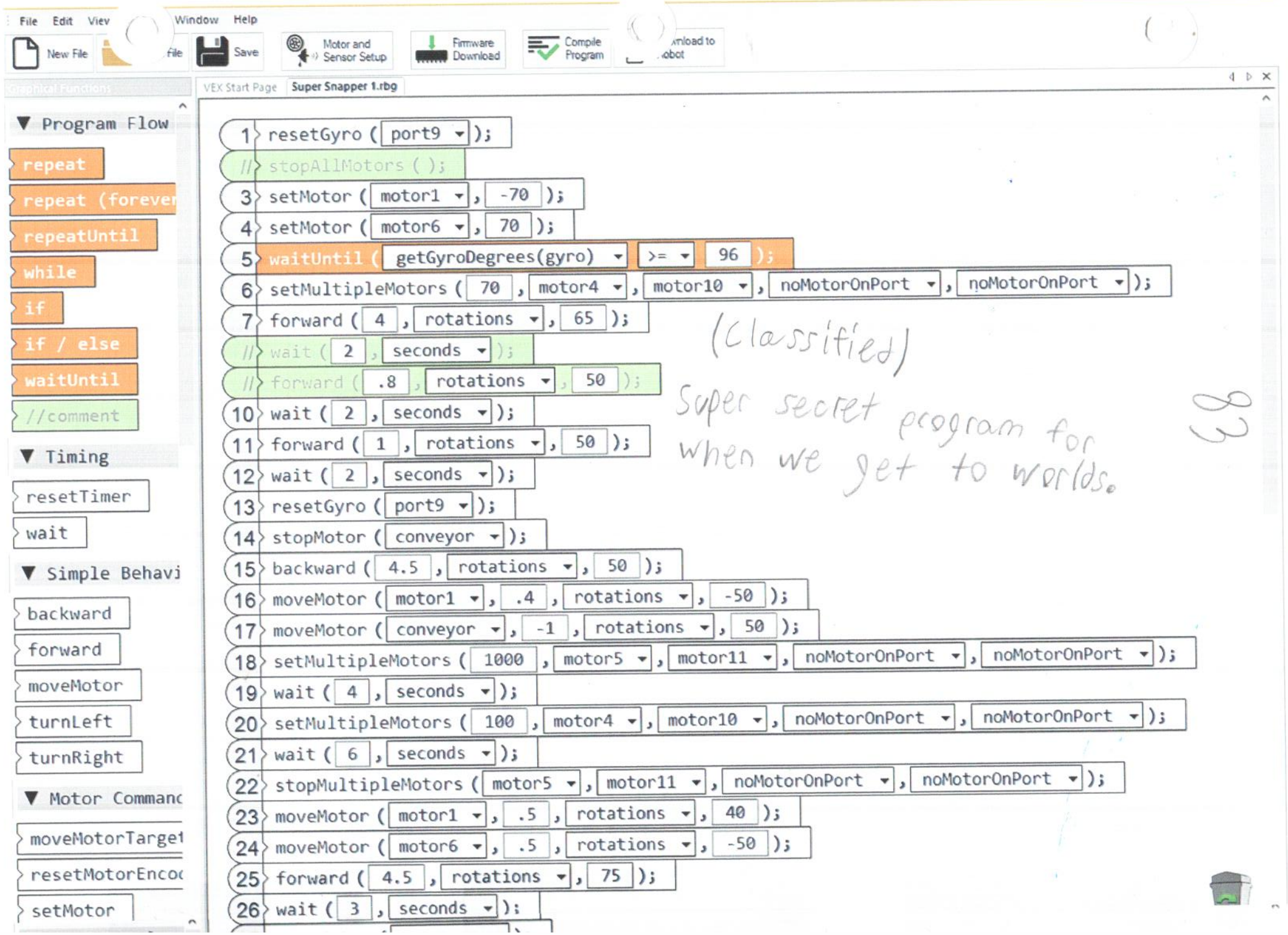


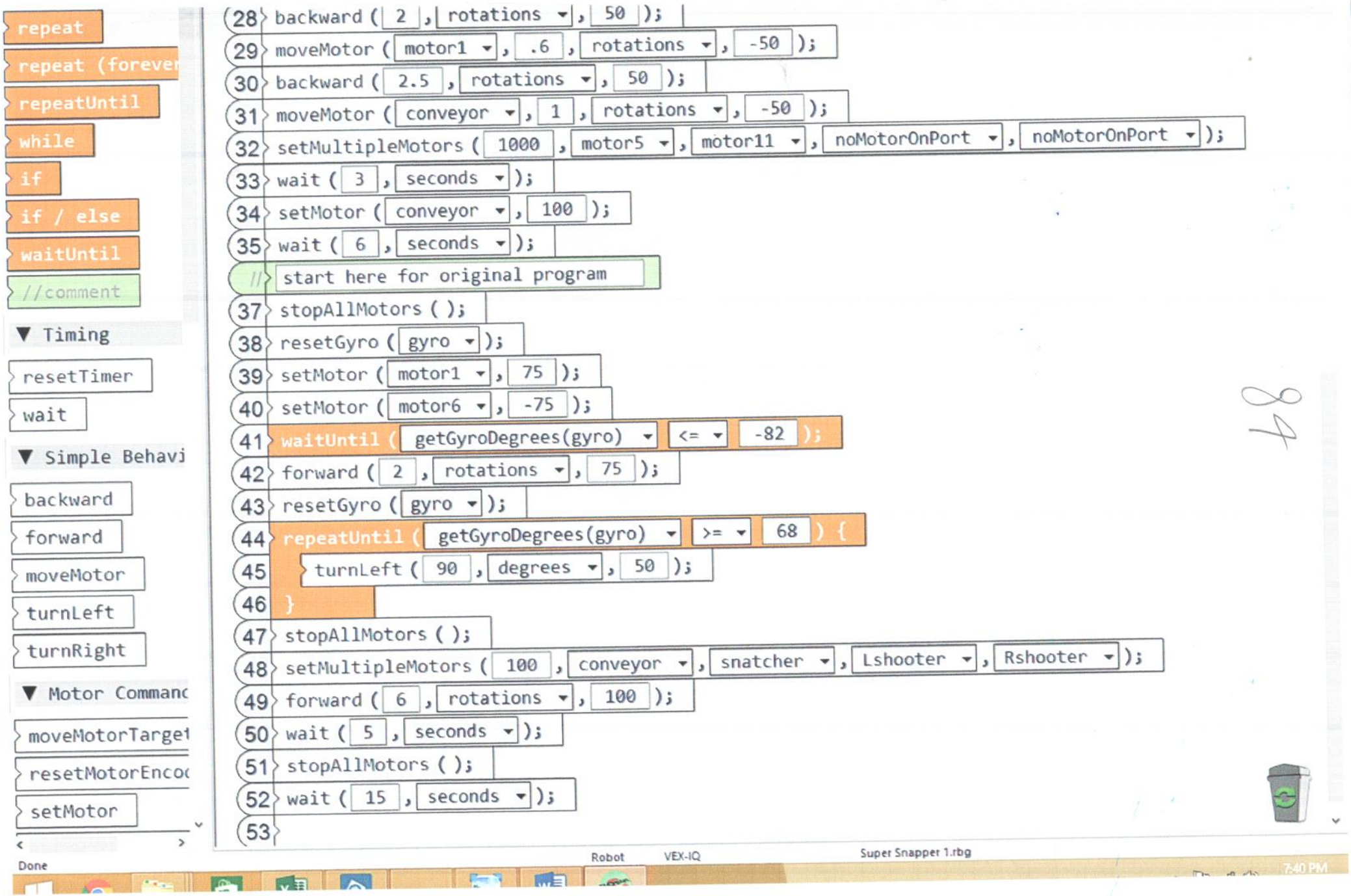
For Help, press F1 | Robot | VEX-IQ | Ramp only.rbg | 0 Errors, 1 Warnings


File Edit View Window Help
New File
Save
Motor and Sensor Setup
Firmware Download
Compile Program
VEX Start Page
Jeopardy game (2).rbg
▼ 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
turnRight
repeat (forever) {
while (getTimer(T1, seconds) < 2000) {
if (getBumperValue(bumpersensor1) == false) {
setTouchLEDColor (touchLED , colorRed);
} else {
playSound (soundTada);
setTouchLEDColor (touchLED , colorLimeGreen);
wait (3 , seconds);
}
if (getBumperValue(bumpersensor2) == false) {
setTouchLEDColor (touchLED , colorRed);
} else {
setTouchLEDColor (touchLED , colorBlueGreen);
playSound (soundCarAlarm2);
wait (3 , seconds);
}
if (getBumperValue(bumpersensor3) == false) {
setTouchLEDColor (touchLED , colorRed);
} else {
setTouchLEDColor (touchLED , colorViolet);
playSound (soundGasFillup);
wait (3 , seconds);
}
if (getBumperValue(bumpersensor4) == false) {
setTouchLEDColor (touchLED , colorRed);
} else {
setTouchLEDColor (touchLED , colorDarkYellow);
playSound (soundRatchet4);
Stem reasearch
Jeopardy game
Programing



Programing Jeppardy game.


File Edit View Window Help
New File
Save
Motor and Sensor Setup
Firmware Download
Compile Program
VEX Start Page
Super Snapper 1.rbg
▼ 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
1 resetGyro (port9);
// stopAllMotors ( );
3 setMotor (motor1 , -70);
4 setMotor (motor6 , 70);
5 waitUntil (getGyroDegrees(gyro) >= 96);
6 setMultipleMotors (70 , motor4 , motor10 , noMotorOnPort , noMotorOnPort);
7 forward (4 , rotations , 65);
// wait (2 , seconds);
// 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 , motor11 , noMotorOnPort , noMotorOnPort);
19 wait (4 , seconds);
20 setMultipleMotors (100 , motor4 , motor10 , noMotorOnPort , noMotorOnPort);
21 wait (6 , seconds);
22 stopMultipleMotors (motor5 , motor11 , noMotorOnPort , noMotorOnPort);
23 moveMotor (motor1 , .5 , rotations , 40);
24 moveMotor (motor6 , .5 , rotations , -50);
25 forward (4.5 , rotations , 75);
26 wait (3 , seconds);
(Classified)
Super secret program for when we get to worlds.


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
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
48
Done
Robot
VEX-IQ
Super Snapper 1.rbg
7:40 PM



We're Going To States!



Elementary Excellence



Programming skills

Jasemine

I liked at the last competition is when our team didn't fall ofs 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

driving.



Luis

I learned to talk to Your aliénce partner and get a plan. And make a plan with Your driving skills buddy. Stem could use more pazas, Pit needs color and decoration. I would even out the wieht so it wont tip over.



Gabe
Robotics

- I though programing went really well.
- Aliance coulbe 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 goal.



9d



after stem presentation

Grace

January 31, 2016

At the compitition 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 stratigy 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.





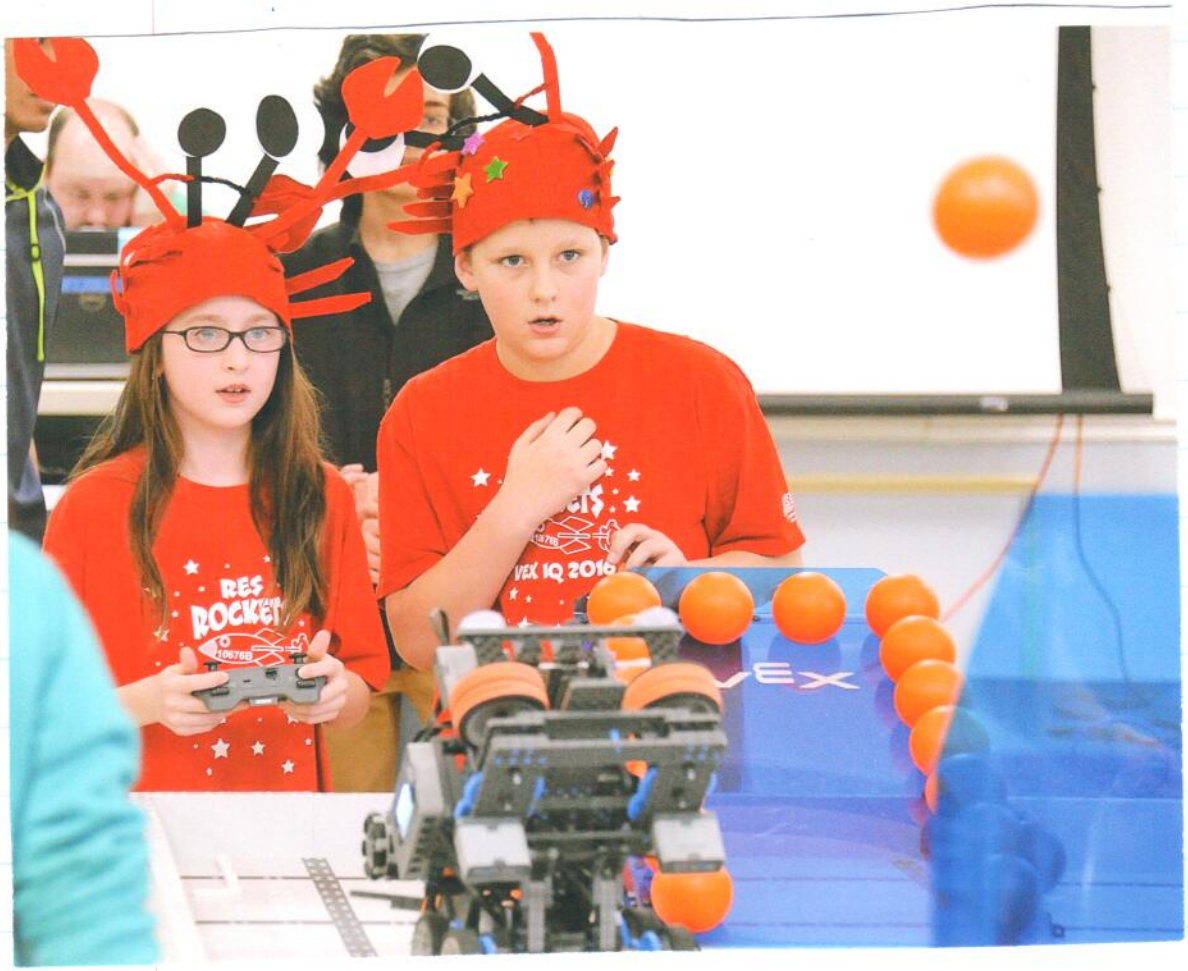

RES
ROCKETS

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 cand put it in the starter square.




RES
ROCKET
VEX IQ 2016
VEX

95

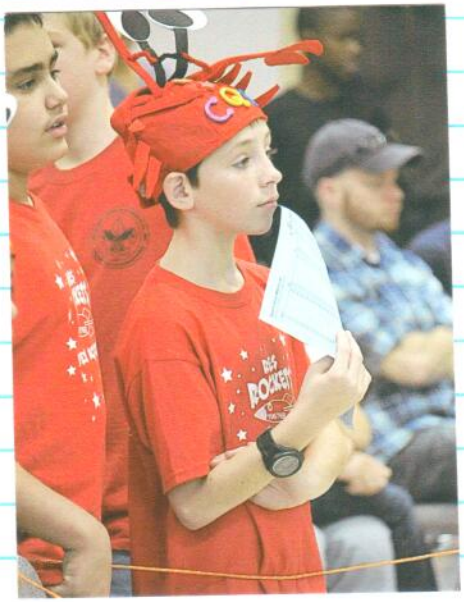
The competition war very very stressful



Please go up the RAMP!



Please dont fall off the RAMP!



Please let our score be high enough.



Does the judge like our design



please let the judges like our STEM

½ 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 driver.

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 top (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 accross 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 allience partners couldnt 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 teleop so we can shoot from the table the whole time instead of the ramp, and we made one so we shoot from the ramp the first half. And if they cant get up the ramp well we will ask if we can push them.

File Edit View Window Help

New File | Save | Motor and Sensor Setup | Firmware Download | Compile Program

VEX Start Page | snapper controller.rbg

▼ Program Flow
- repeat
- repeat (forever
- repeatUntil
- while
- if
- if / else
- waitUntil
- //comment

▼ Timing
- resetTimer
- wait

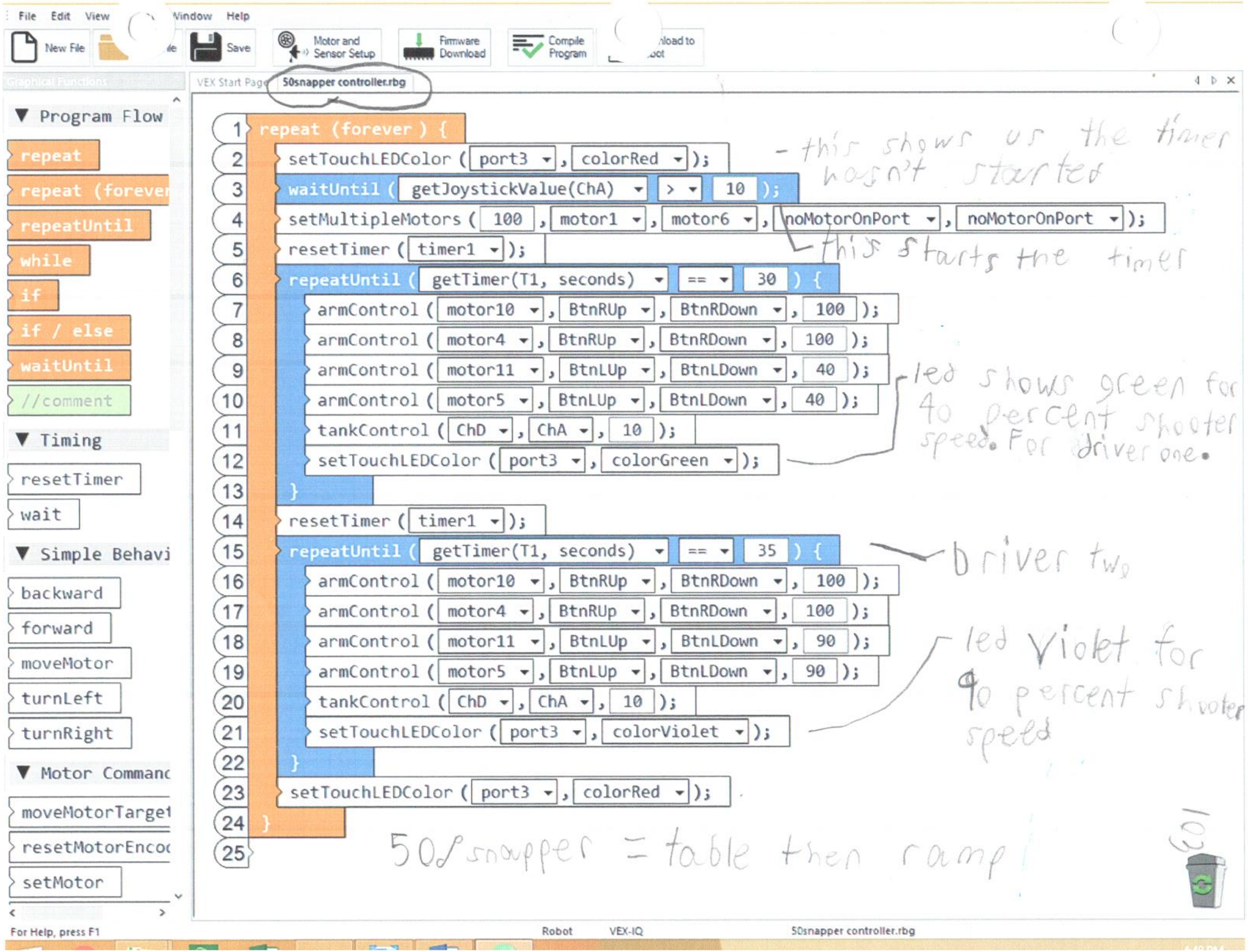
▼ Simple Behavi
- backward
- forward
- moveMotor
- turnLeft
- turnRight

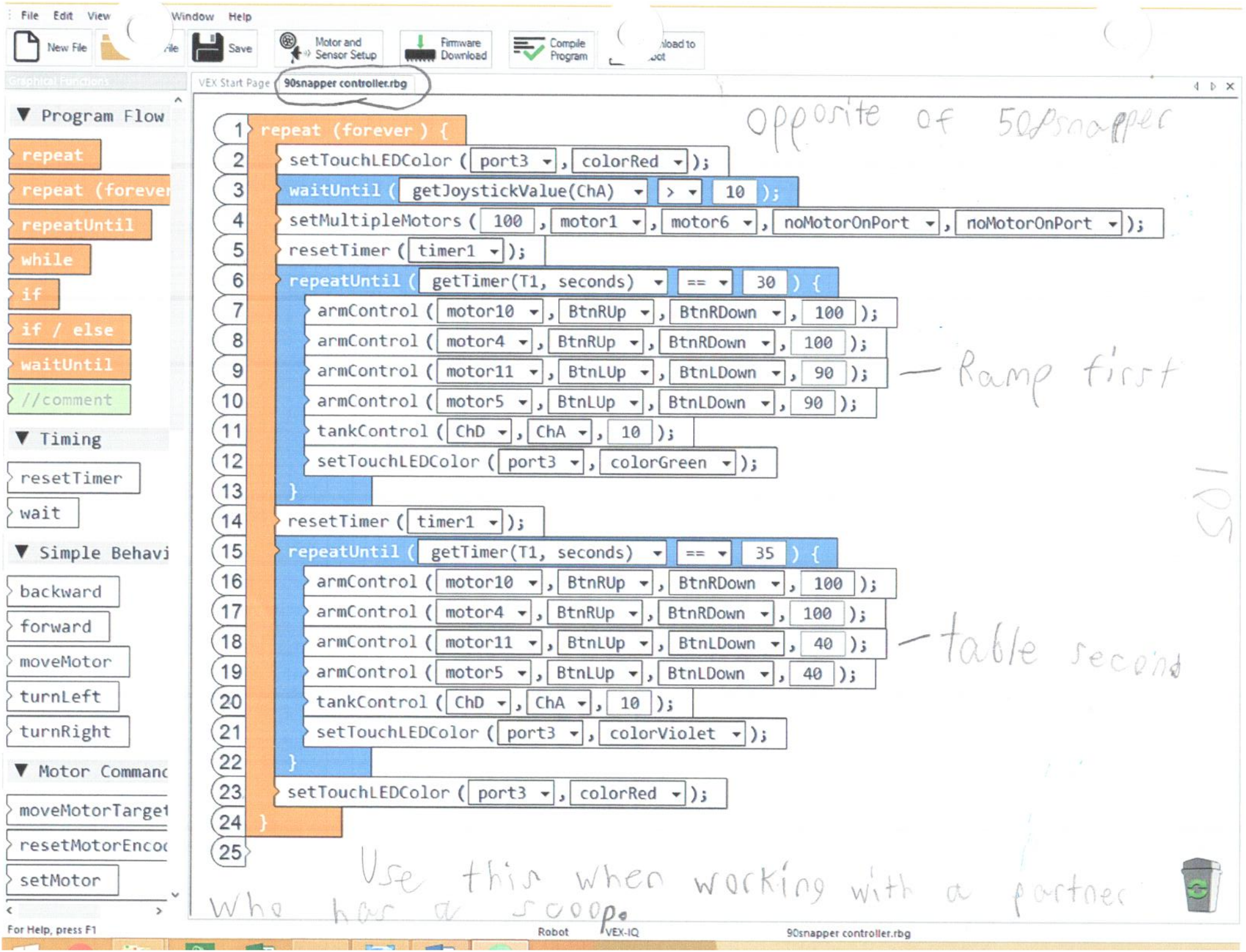
▼ Motor Commanc
- moveMotorTarget
- resetMotorEncoc
- setMotor

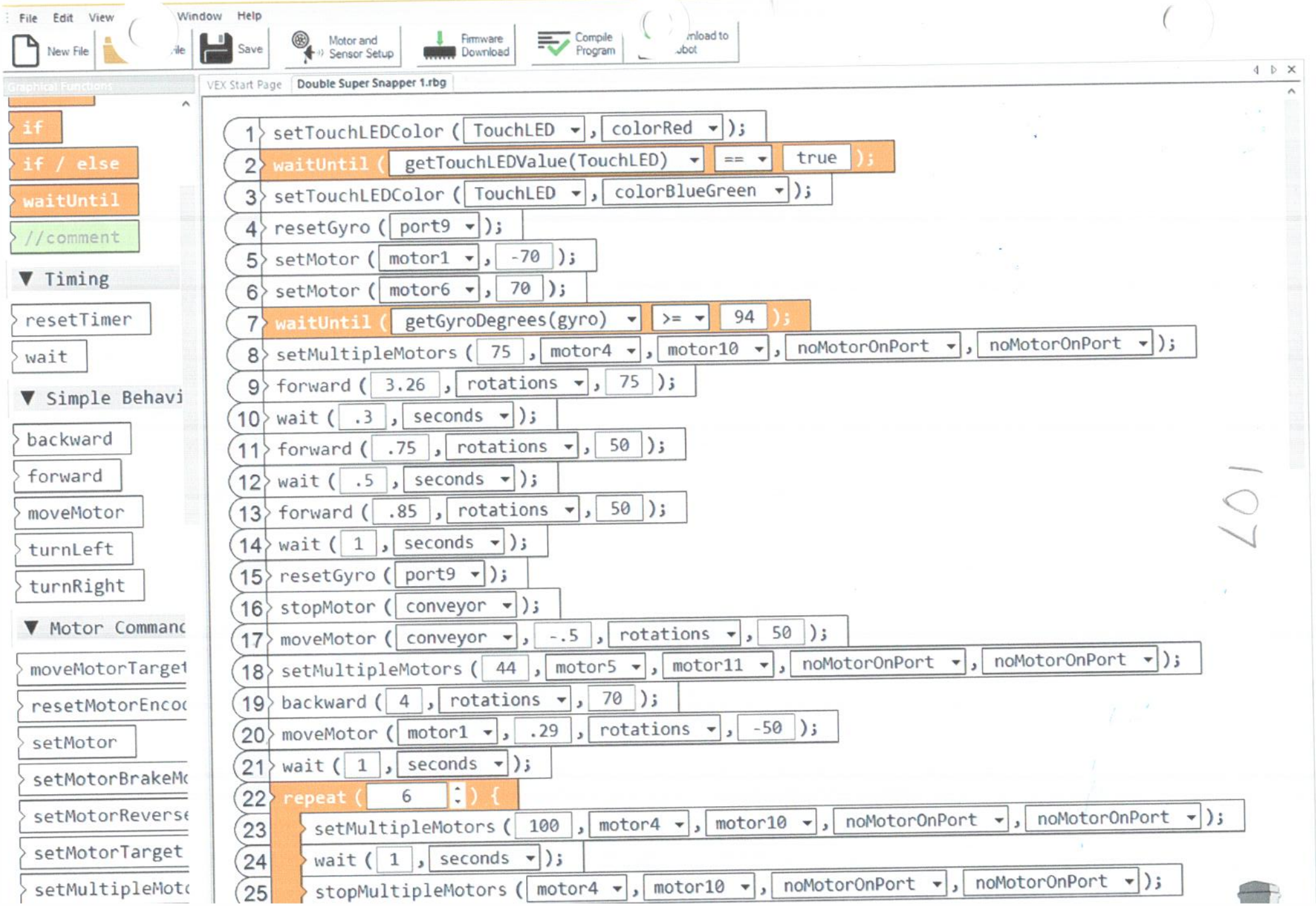
```
1 repeat (forever ) {
2   armControl ( motor10 , BtnRUp , BtnRDown , 100 );
3   armControl ( motor4 , BtnRUp , BtnRDown , 100 );
4   armControl ( motor11 , BtnLUp , BtnLDown , 40 );
5   armControl ( motor5 , BtnLUp , BtnLDown , 40 );
6   tankControl ( ChD , ChA , 10 );
7 }
8
```

We made this program because some of our allience partners knocked all the balls off the ramp right away. Because our robot shoots balls from the ramp, we couldnt do any thing for the second part of the match. This program will let us work from the same table if we need to.

For Help, press F1 | Robot | VEX-IQ | snapper controller.rbg

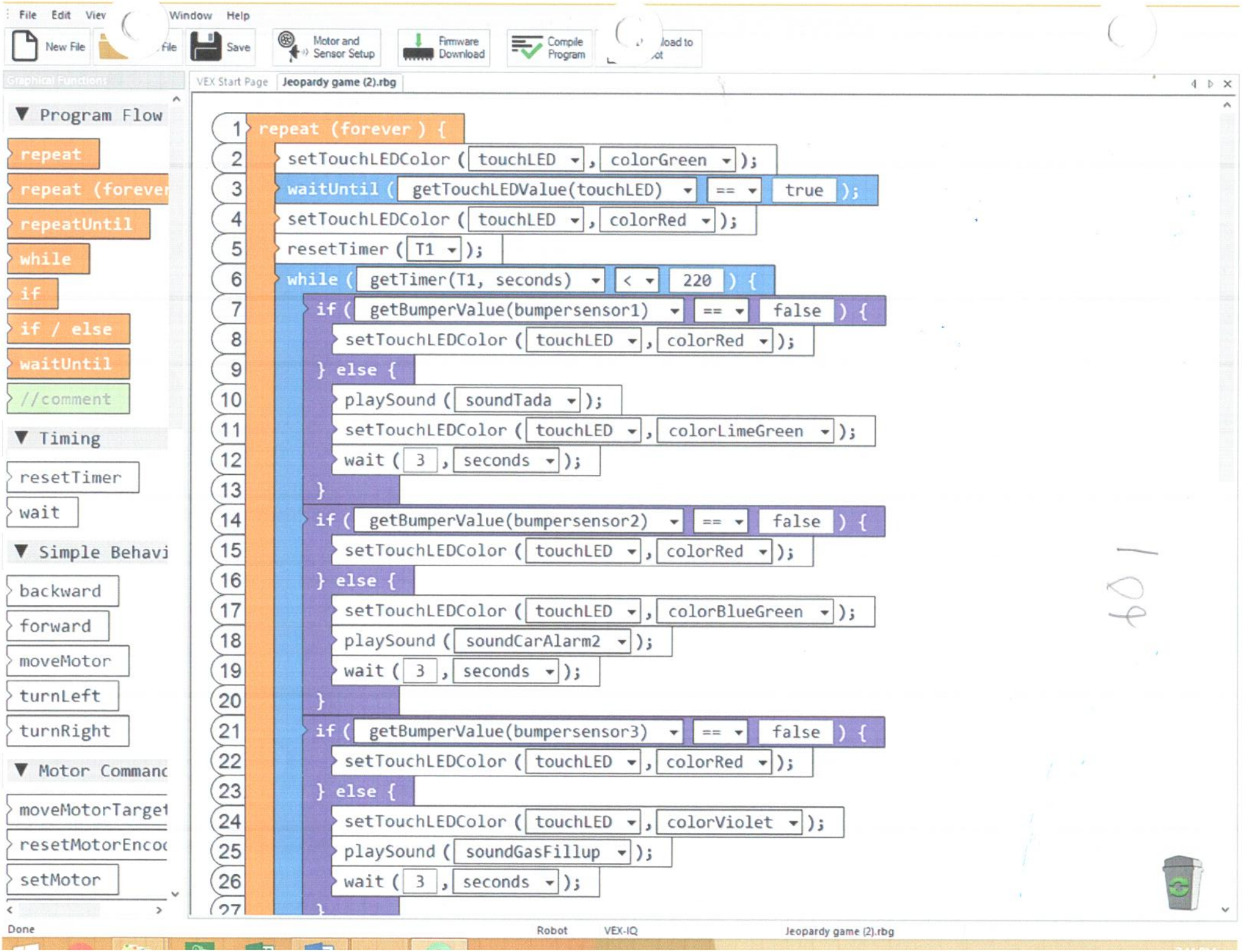

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New File
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Motor and Sensor Setup
Firmware Download
Compile Program
VEX Start Page
50snapper controller.rbg
▼ Program Flow
repeat
repeat (forever
repeatUntil
while
if
if / else
waitUntil
//comment
▼ Timing
resetTimer
wait
▼ Simple Behavi
backward
forward
moveMotor
turnLeft
turnRight
▼ Motor Commanc
moveMotorTarget
resetMotorEncoc
setMotor
1 repeat (forever) {
2 setTouchLEDColor (port3 , colorRed);
3 waitUntil (getJoystickValue(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
- this shows us the timer hasn'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
50/snapper = table then ramp
For Help, press F1
Robot VEX-IQ
50snapper controller.rbg

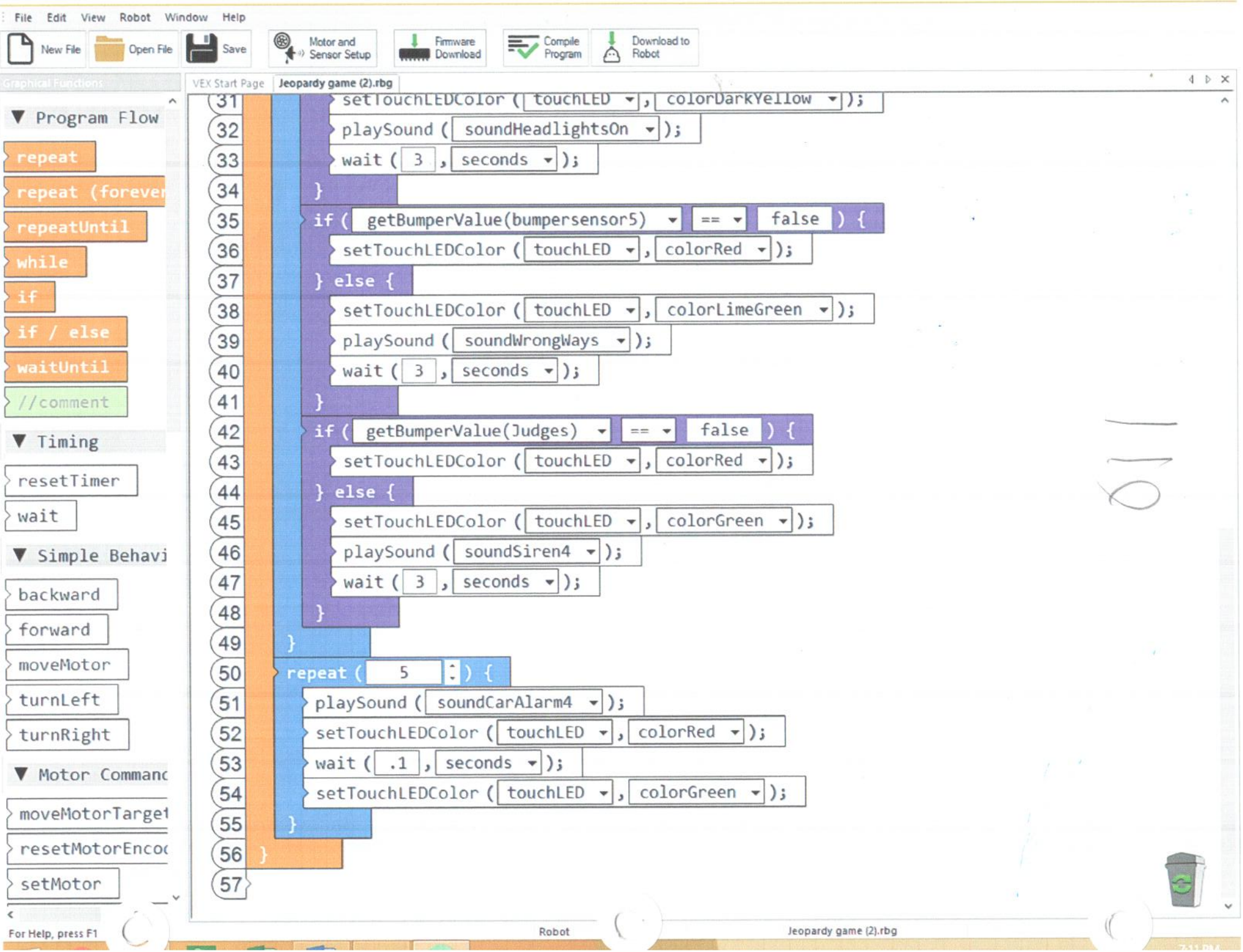

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Compile Program
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90snapper controller.rbg
Program Flow
repeat
repeat (forever
repeatUntil
while
if
if / else
waitUntil
//comment
Timing
resetTimer
wait
Simple Behavi
backward
forward
moveMotor
turnLeft
turnRight
Motor Commanc
moveMotorTarget
resetMotorEncoc
setMotor
1 repeat (forever) {
2 setTouchLEDColor (port3 , colorRed);
3 waitUntil (getJoystickValue(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 , 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
opposite of 50snapper
Ramp first
table second
Use this when working with a partner
who has a scoop.
For Help, press F1
Robot
VEX-IQ
90snapper controller.rbg


File Edit View Window Help
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Compile Program
Graphical Functions
VEX Start Page
Double Super Snapper 1.rbg
if
if / else
waitUntil
//comment
▼ Timing
resetTimer
wait
▼ Simple Behavi
backward
forward
moveMotor
turnLeft
turnRight
▼ Motor Commanc
moveMotorTarget
resetMotorEncoc
setMotor
setMotorBrakeMc
setMotorReverse
setMotorTarget
setMultipleMotc
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 , 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 , 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 , noMotorOnPort);
24 wait (1 , seconds);
25 stopMultipleMotors (motor4 , motor10 , noMotorOnPort , noMotorOnPort);

```
}
stopAllMotors ( );
playSound ( soundGasFillup );
waitUntil ( getTouchLEDValue(TouchLED) == true );
setTouchLEDColor ( TouchLED , colorViolet );
// start here for original program
resetGyro ( gyro );
forward ( 2.6 , rotations , 60 );
resetGyro ( gyro );
setMotor ( motor1 , -50 );
setMotor ( motor6 , 50 );
waitUntil ( getGyroDegrees(gyro) >= 77 );
stopAllMotors ( );
resetGyro ( gyro );
setMultipleMotors ( 67 , conveyor , snatcher , Lshooter , Rshooter );
forward ( 5.44 , rotations , 70 );
turnLeft ( .075 , rotations , 50 );
wait ( 7 , seconds );
turnRight ( .275 , rotations , 50 );
forward ( .3 , rotations , 50 );
wait ( .751 , seconds );
turnLeft ( .37 , rotations , 50 );
wait ( 7 , seconds );
turnLeft ( .3 , rotations , 50 );
forward ( .4 , rotations , 50 );
wait ( .75 , seconds );
turnRight ( .32 , rotations , 50 );
wait ( 5 , seconds );
stopAllMotors ( );
repeat ( 5 ) {
    playSound ( soundCarAlarm4 );
```




File Edit View Window Help
New File
Save
Motor and Sensor Setup
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Compile Program
VEX Start Page
Jeopardy game (2).rbg
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
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 }
Done
Robot
VEX-IQ
Jeopardy game (2).rbg


File Edit View Robot Window Help
New File
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Motor and Sensor Setup
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Download to Robot
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▼ Program Flow
repeat
repeat (forever
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resetTimer
wait
▼ Simple Behavi
backward
forward
moveMotor
turnLeft
turnRight
▼ Motor Commanc
moveMotorTarget
resetMotorEncoc
setMotor
setTouchLEDColor (touchLED , colorDarkYellow);
playSound (soundHeadlightsOn);
wait (3 , seconds);
if (getBumperValue(bumpersensor5) == false) {
setTouchLEDColor (touchLED , colorRed);
} else {
setTouchLEDColor (touchLED , colorLimeGreen);
playSound (soundWrongWays);
wait (3 , seconds);
if (getBumperValue(Judges) == false) {
setTouchLEDColor (touchLED , colorRed);
} else {
setTouchLEDColor (touchLED , colorGreen);
playSound (soundSiren4);
wait (3 , seconds);
repeat (5) {
playSound (soundCarAlarm4);
setTouchLEDColor (touchLED , colorRed);
wait (.1 , seconds);
setTouchLEDColor (touchLED , colorGreen);
For Help, press F1
Robot
Jeopardy game (2).rbg





we're going to worlds!

Qualification Rankings
DEFAULT DIVISION

HARRIS

Rank	Team #	Name	Matches	Points
1	10676E	RES Rock and Roll Rockets	3	184
2	11260	The Blue Crabs	3	182
3	929D	Hereford Zone Robotics	3	181
4	10553A	Margaret Brent	3	174
5	11375E	Robolions	3	160
6	24K	Super Sonic Sparks	3	159
7	952P	RMS Robotics	3	157
8	952J	RMS Robotics	3	155
9	952F	RMS Robotics	3	146
10	85571A	BIA OWL's	3	142
11	929C	Hereford Zone Robotics	3	141

Match Sched

Q40	952S
	11260
Q41	10553A
	9290B
Q42	11375E
	952P
Q43	929H
	952G
Q44	10158
	1154
Q45	11601
	9290
Q46	1067
	929C
Q47	10158
	11601
Q48	9290
	929C
Q49	952
	24K



last award please please please be us!



IT IS US! Excellence award !!!!!

Jasemine

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





Destiny and Jasmine



Jasmine

Dahl

reflection of states

1. It was awesome, there wele a lot of supprises.
2. We won! excelence award
3. Were going to worlds!
4. it shows that it just depends who your partnered with for allience



Are final alliance match which were with the Super Sonic Sparks



Gabe getting robot ready

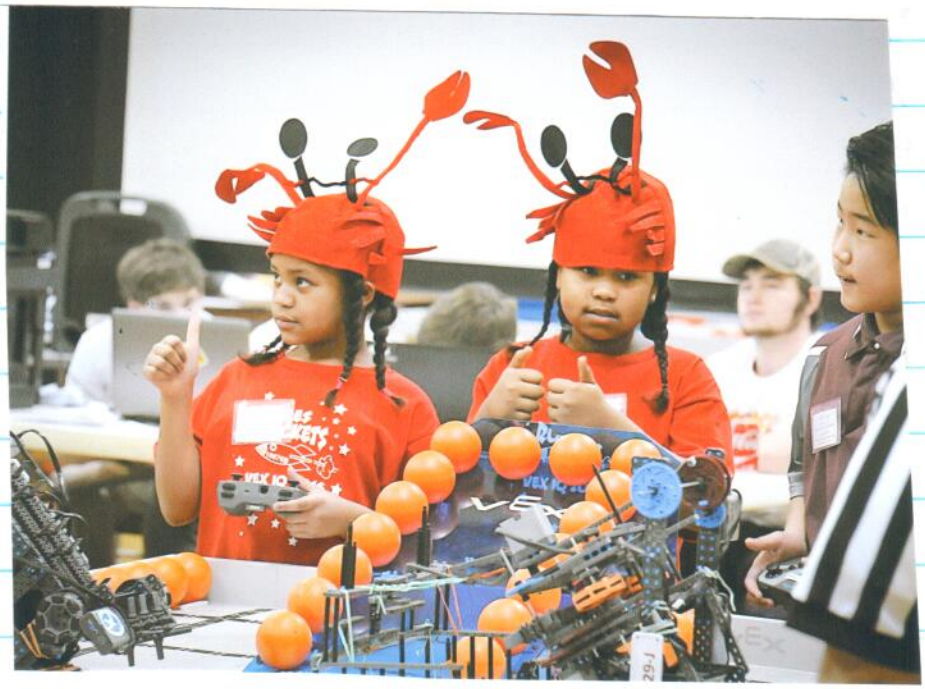


Gabe and Luis driving

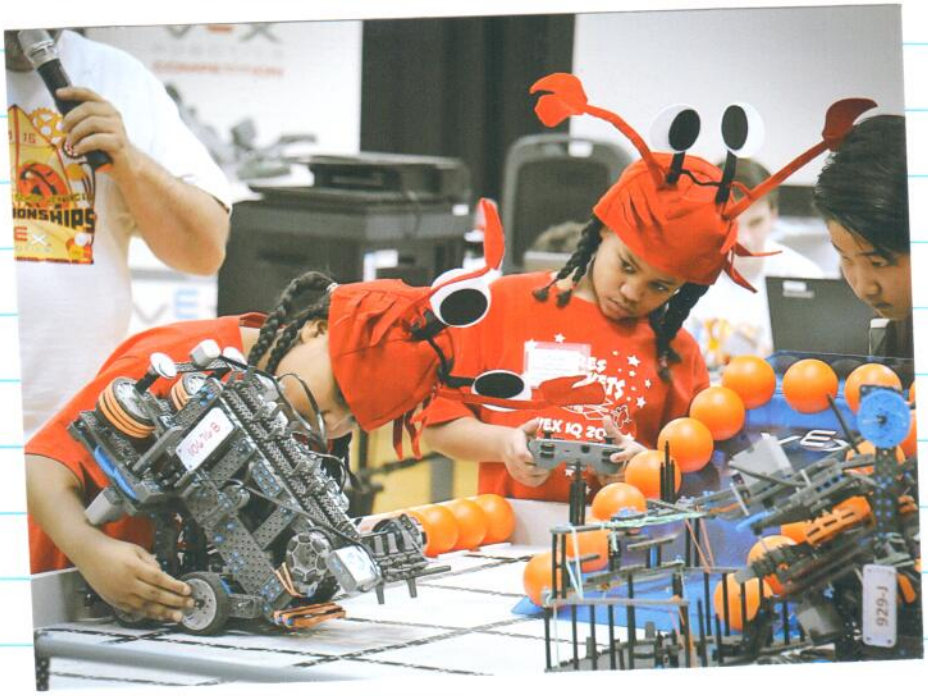
Desting 115

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 our alliance match that we lost 1 point.





Destiny 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 alot.

I learned that compotition is sometimes very stressful.

I do not want to be playing around inbetween matches because we might have a match soon or judjes 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 turing to the right,



129



Conner and Jasmine

129



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 programing 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

- 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 a lot of white powder on the big washers so we changed to little washers, in effect now our turns in our programs are off.

- Programing skills team is 101% sure that the robot was lined up

Solution

- We decided to not make any changes till we test it on the ramp 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 Univisity 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

we will go help with.

Congratulating Bay Stewardship

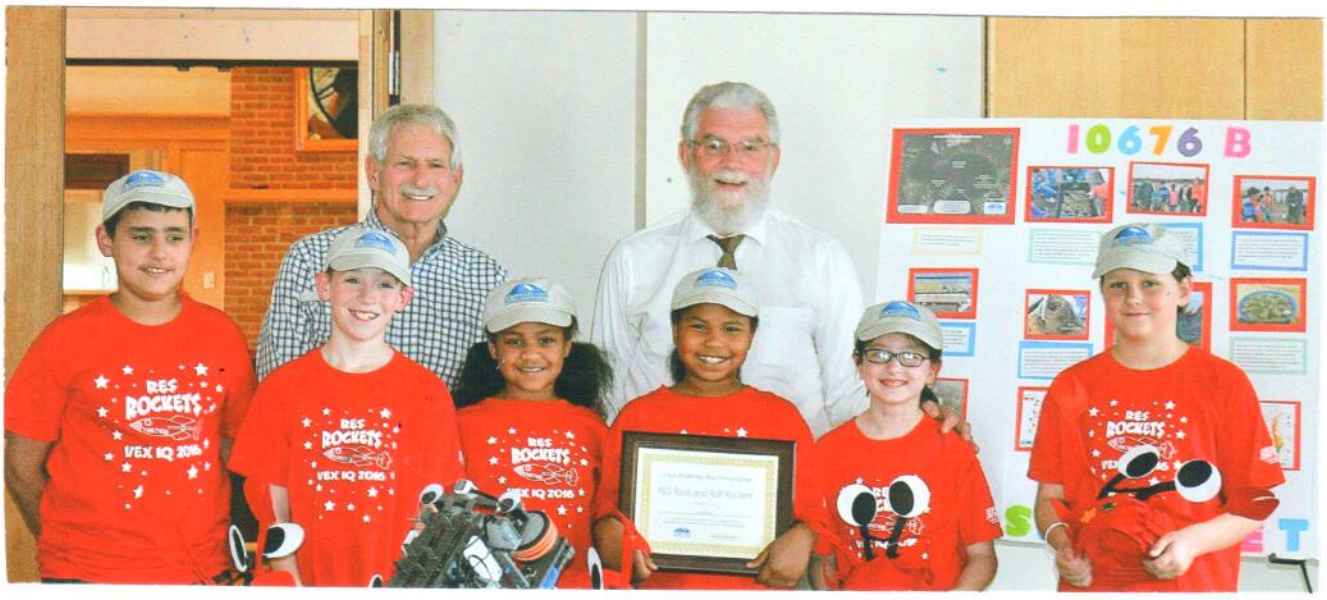
RES Rock and Roll Rockets

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.

ST. MARY'S RIVER
Watershed Association

Joe Anderson, President





St. Marys river watershed association board of directors presentation



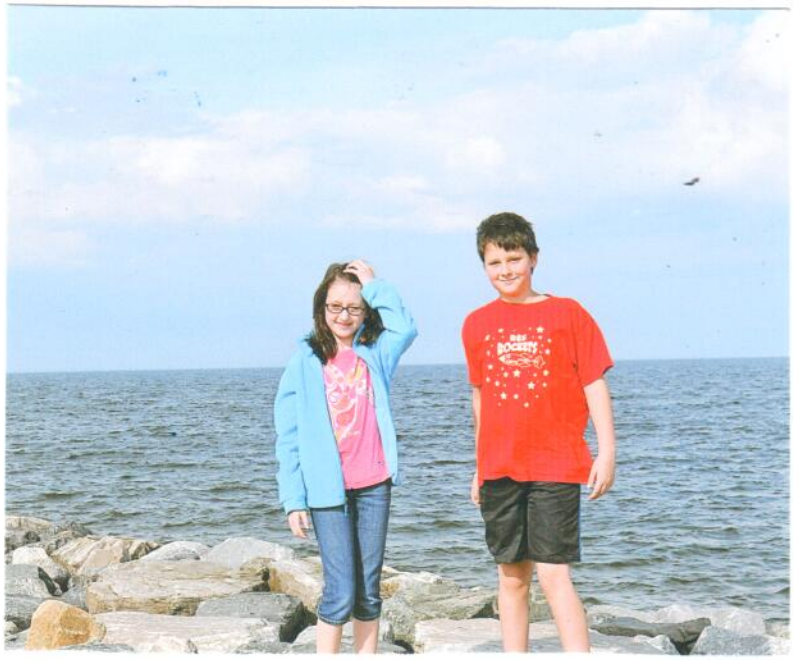
Presenting to the Steam Sound show



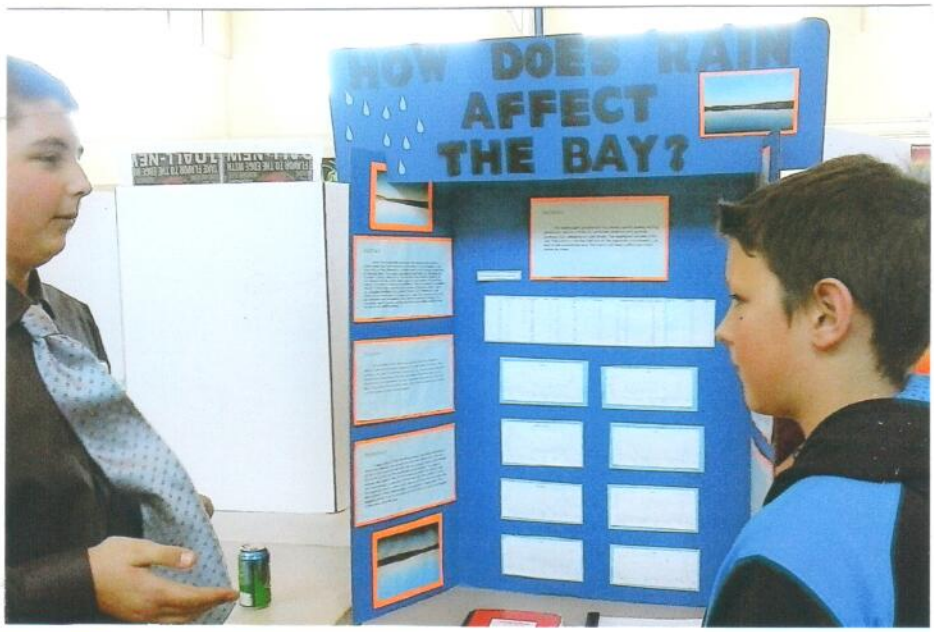
Presenting to school teachers



after presenting to Mr. Luis and Ms. Meghan



we took a trip to where the Potomac and Chesapeke ~~meet~~



We went to a science fair and learned about the bay



We went to the Calvert Marine Museum and learned about foodwebs and how oysters are important.

Calvert Marine Muesum



Calvert Marine Muesum otter tank



Conner and Mr. Luis bagging shells for oysters.

