ROBOT DESIGN EXECUTIVE SUMMARY

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Robot Design Summary

Mechanics Summary

Robot Features What is your favorite? What is most innovative?	The sensors and bumper makes our robot, Granite, innovative. We love how the first three programs are linked together and sent off with a touch sensor. The bumper is durable and can help square up the robot and push things. click here for more
Attachments Describe each one and its purpose.	We have 7 launches achieving 12 missions, so we didn't waste time with attachments. Our team basically strips parts of the front gate-one time to complete Safety Factor. click here for more
Motors What motors are on your Robot? What purpose do they serve?	Granite has the maximum number of motors on it. We have 4 rotational sensors: 2 large and 2 small. One of the small motors is used for the front gate and the other small motor is used for the crane on top. We like the top motor because it allows us to achieve the tree house and elevator-but does throw the weight off a bit.
Sensors What sensors are on your Robot? What purpose do they serve?	Granite has 3 light sensors and a touch sensor. The color/light sensors allow us to use proportional line following and coasting when it sees a black line. The touch sensor provided an opportunity to launch quickly because we joined programs together. click here for more
Strategy How did you choose the missions you worked on?	1. Learn all the mission rules inside and out. 2. The Beam Test 3. Decide on the High, Low and Medium Priorities-and the most fun mission click here for more
Design Process What processes did you use to design your Robot?	After our team decided on the high priority missions, we brainstormed all the design features the robot would need. We experimented with different tires, gear ratios and measured some of the tight spaces. The bridge was our first challenge, as the light sensors were in the way-so we designed them to tilt back. click here for more
Core Values How were Core Values used throughout the creation of the Robot?	Our team definitely used innovation to solve problems like getting past the elevator and ways to use the blocks for maximum points. We discovered new programming skills and had a lot of fun together programming on the weekend and sending videos to our coaches. Sometimes we had to include ideas and also let ideas go-that was really hard because the Speed bot-our first robot was so awesome! We also tag team in and out of launches. click here for more

Program Summary

Granite fits in the small inspection area! Plus 5 points on each mission achieved (include). We start with 75 points on the table. 440 max points

What can your Robot do? List every program you plan to run during an event. Attach additional pages if needed.

Program Name	Mission(s) Accomplished	Programmed Robot Actions	Mission Success Rate
Triple Threat 145 points	Innovative Architecture Design and Build-3 times (Color matching and 4 high) Sustainability Upgrades (3)	Link to program Tip: Be calm, Touch Sensor On Drivers: Charlie and Caroline	100%
SP Arm Plus 105 points	Swing Elevator Bridge	Link to program Tip: Rotate tires back Drivers: Nico and Gia	80% (3/3)
Crane Plus 60 points	Crane: All three scoring situations	Link to program Drivers: Sarah and Gia Tip: The blue circle is not part of Mission 12	80% (⅔)
Double Trouble 30 points Include blue block	Design and Build	Link to program Drivers: Gia and Emi Very fast mission-uses bumper extensions	100%
Safety Factor-25 30 points-three beams Plus 5	Safety Factor	Tip: Make sure the light sensors are on and working	80% (3 beams)

Click here

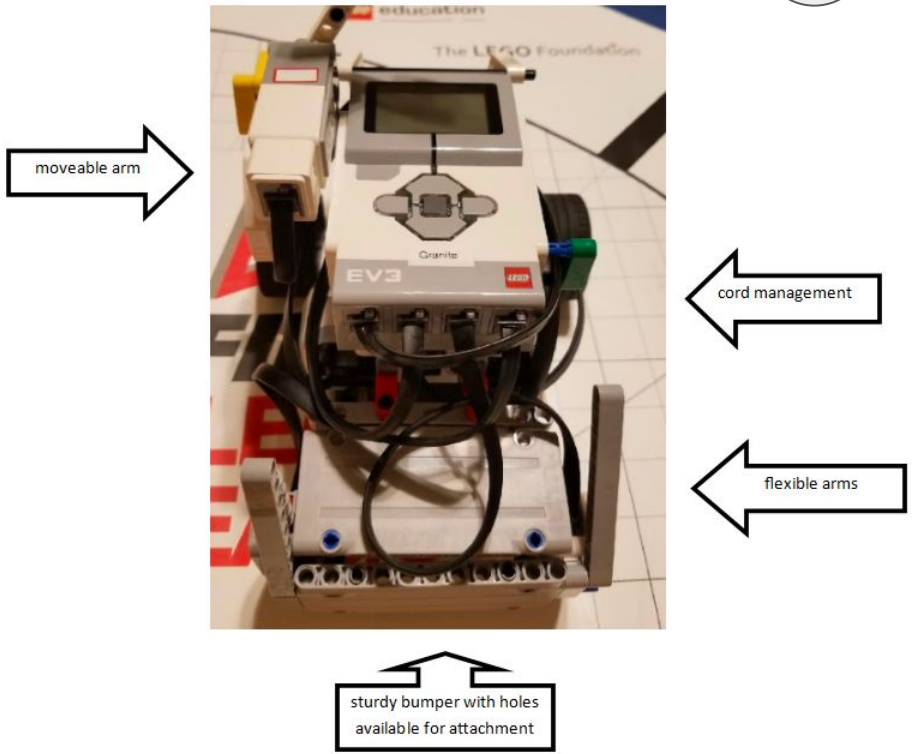
ABOUT GRANITE

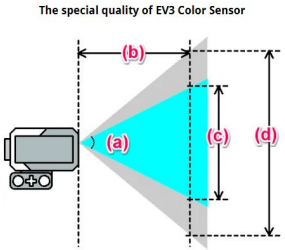
Our team robot weighs 2 pounds and is exactly 11.75 inches tall. The robot has 7 sensors: 4 rotational sensors or motors, 3 light sensors and 1 touch sensor. Granite's front light sensors are also "flexible" so when the robot gets up the bridge, the light sensors bend backwards which lets the robot go up the bridge. We were careful to build it to fit inside the small inspection area-to get the extra points.

About Granite Continued...

The front wheels are 7 inches around and 2 ¾ in diameter. The back wheel is a castor wheel-which is a whole other story. The robot is asymmetrical in weigh and design.

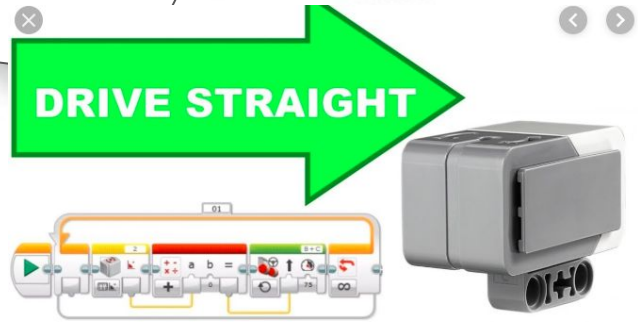
- There are 7 launches, with 5 programs- that accomplish 12 missions FOR A TOTAL OF 425 points
- Thick fat wheels to help it run straight, but the friction variable on the turns is why we like to run into things to straighten the robot out.
- We almost never take a touch penalty.
- We don't waste time with attachments.





One Colour Sensor
- Detects colours
- Measures light intensity, ambient and reflected light
- AutoID

Next Steps???
Gyro Sensor



Those light sensors!

- Is it plugged in?
- Do we have the right port in our code?
- Is it close enough to the mat?
- Do we have the right color(s) selected?
- What does the light intensity read in port view?
- Again, is it plugged in?

Mission	Location from Launch Near/Far	Navigation Easy/Hard	Combine with Mission	Activation Method	Other Factors	Points
5 Treehouse	mid	md	elevated places	from base		LB=10 SB=15 (could add bonus)
6 Traffic Jam	easy	mid	swing	From base		10
7 Swing	far	mid	traffic jam	from TJ	has black line all the way there posible dilivers x may have to go back for light sensor	20
8 Elevator	far	hard	steel contruction	from base		40 (+ bonus)
9 Safety Factor	far	mid	elevator	from elevator?		10 each beam

Created by FLLTutorials.com, 2019

High low medium chart

Passing the Beam Test= Easy Mission

Ten Team Members= 5 Programs-Tag Teaming

1. Learn all the mission rules inside and out.
2. The Beam Test
3. Decide on the High, Low and Medium Priorities-and the most fun mission

Communication

Starting in the summer, we all made our own robots and attachments, crazy with the ideas: a claw,ultrasonic sensors, touch sensors, and color sensors!

- After we agreed on what our robot needed to achieve the missions-we combined all of our summer robot ideas.
- Last year's Robotics Club helped-Caroline actually taught at the club! The money was used to buy some new technology for our school and the team
- Programming partners write the code and it is narrated for everyone to understand and to fix a mistake in the program if it is incorrect.

Communication

We listen to each other's ideas, but are careful to stay focused on some team decisions. For example:

- Our team does not use a jig-too many robot updates on that one.
- We collaborated virtually using our Google Team Drive what missions and what order could get us the highest points and then stuck to what we came to consensus on.
- Team 329 works on the weekends at on coding-it takes a long time. We save all the programs in three files: Keep, In Progress, Backup.

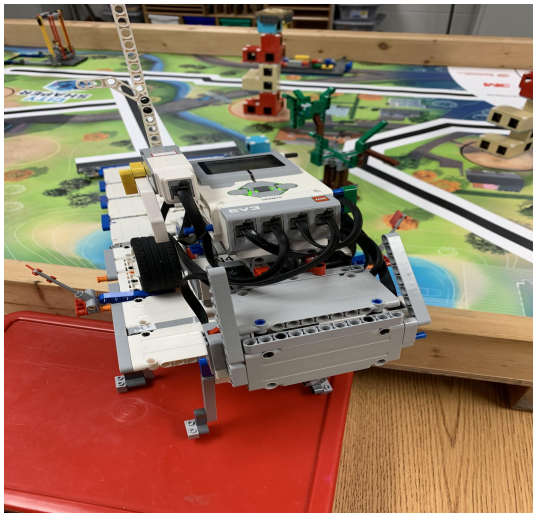
Other "Fun" FACTS

Granite has fallen off the bridge OVER 38 times. So "he" is built to take the "fall" when it...falls. Perhaps that is why the "brain" or brick and both large motors had to be replaced.

We learned that using outdated software is NOT a good thing and that firmware wipes out the brain and new programs we had **just** created.

So from that day on we learned NOT to use outdated software. We are also careful to all save the programs on a flash drive and back them up on the server!

Most Fun: Getting over the bridge and figuring out to make the light sensors tilt back.



Our game strategy is simple...

Have Fun! 😀

Don't complicate things!

Hear everyone's voice!

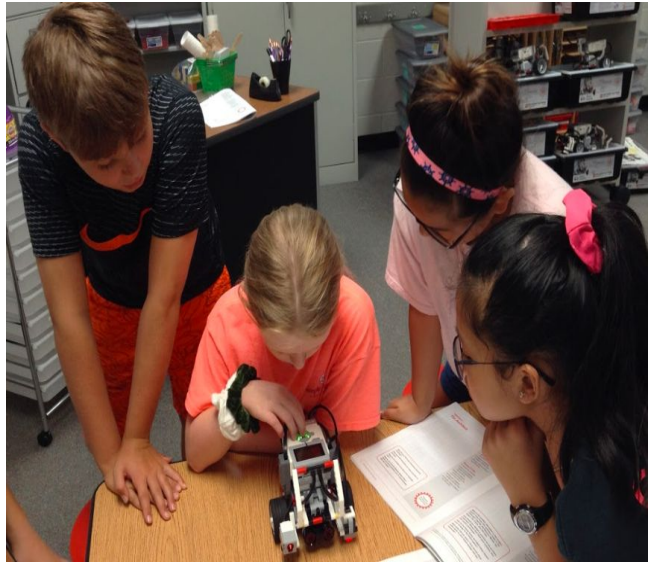
The person running a program is the "best" person to run the program!

Maximum Points in under 2.5 minutes!

At the end of the day it is a robot made of plastic!

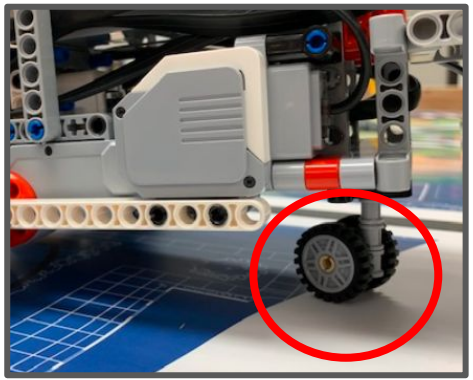
KISS-KEEP IT SUPER SIMPLE/ KEEP IT SIMPLE SILLY

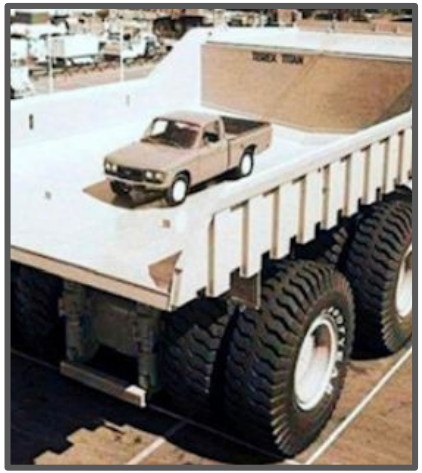
Learning Together



TIRE Troubles Lead to Learning

Fat Tires help with going straight, but add the friction issue. We write our code will turning to turn off one motor and let the other motor run. That way we can get a more accurate turn.Hi





We changed our back wheel multiple times. We first had a caster Wheel that worked then we had bought wheels from Dubai and Denmark that cost a fortune but it didn't work for our programs so we "abandoned" those wheels. 😕

About the CLONE

Everything we do as team 329 is doubled... even team members! Our team has a clone robot because...

- Granite could get dropped at a competition
- More people can write code and participate in the Robot Game

We know no two things are exactly alike-especially rotational sensors, so clone's programs are for her alone. The CLONE has had "sleepovers" at a team members house and is working just as hard as the Rockin' Radons to get ready for competitions!

CLONE and Granite are **similar, not exactly alike.**

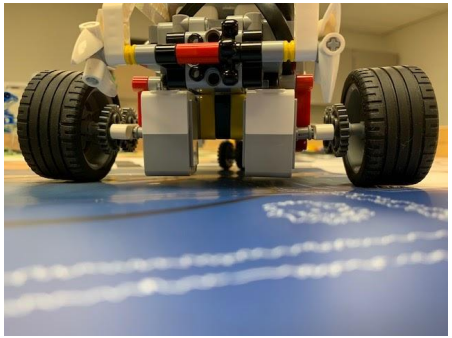
The Speed Bot

Our first robot design was the Speed Bot. It had gears behind the wheels that helped with the speed to make it run 5 times faster than the large motor's normal speed. But after we closely examined our high priority missions, we realized we actually needed to be super careful, slow and accurate-much like building skyscrapers in a city. Even though we could make the robot "run" super fast, we decided to not use the gear ratios because we need to complete our priority missions, not make the robot run super fast.

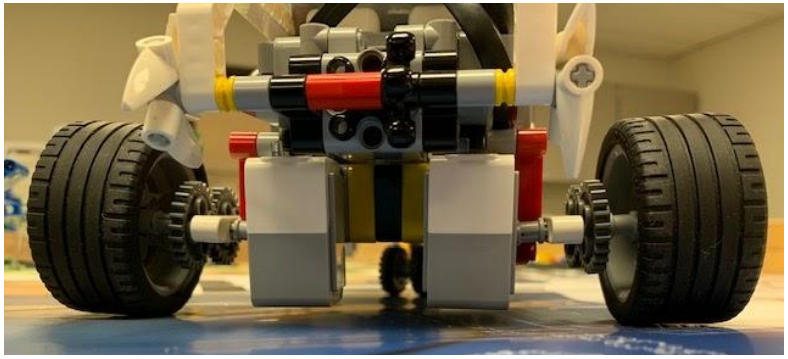
But we did learn a little something about gear ratios:

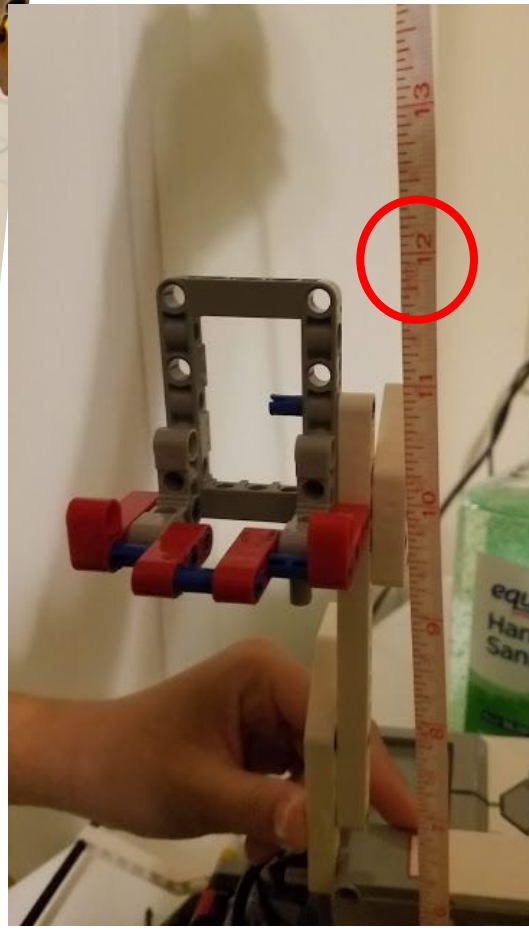
Large gears connected to small gears make the connected wheels go really fast!

Small gears connected to small gears makes the robot go faster!



Robot Designs





Some thoughts from a long day of robot design changes

ALWAYS have a clone of your competition robot!

SAVE the programs! (We sure have had journeys with that…)

Have the newest software and make sure you update your firmware!

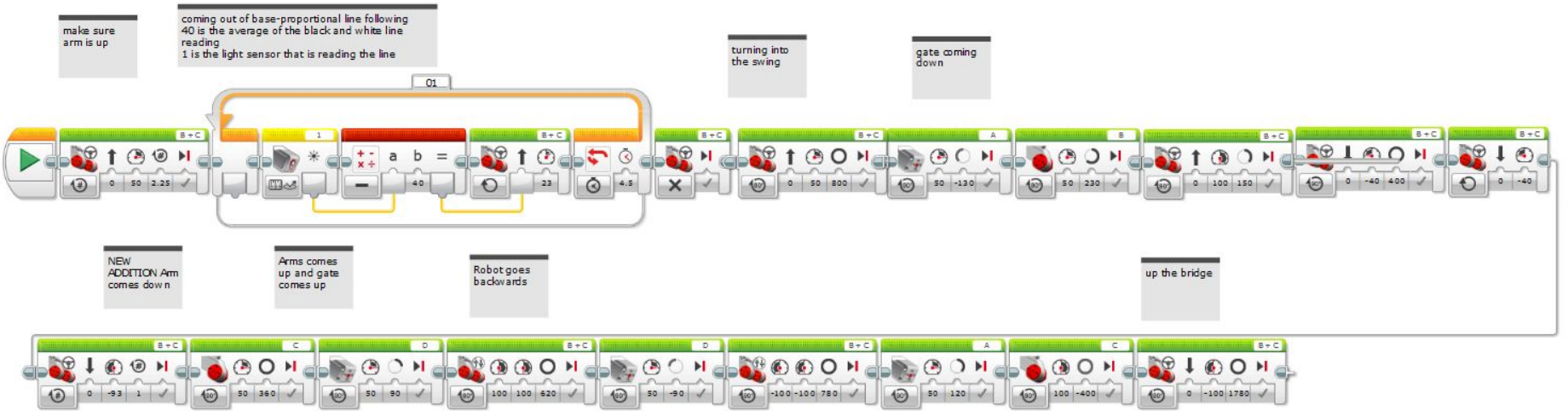
Don't change the programs if the robot is on low battery!

Weight can change robot performance, so be careful with attachment changes!

SP ARM Plus

- Swing
- Elevator-not balanced
- Bridge-flags up

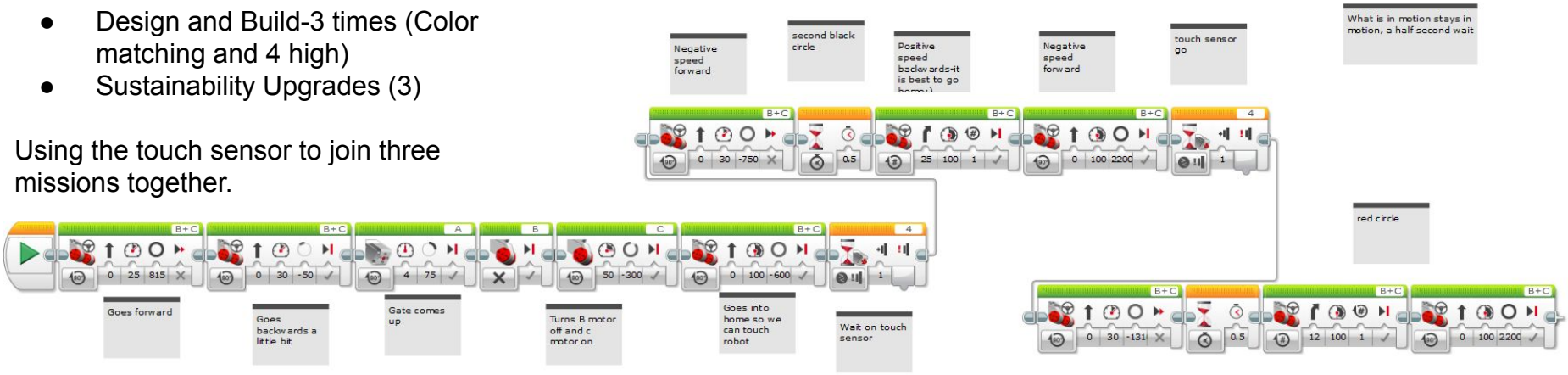
Advanced Programming Information



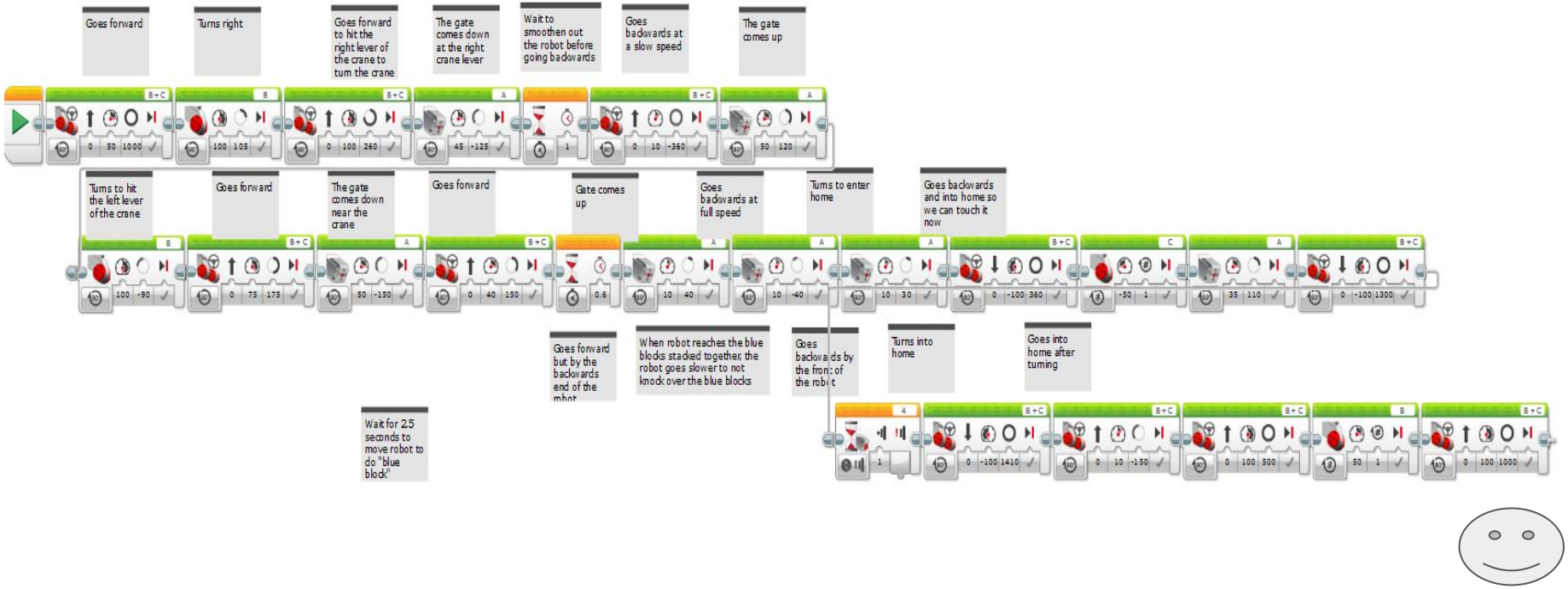
Triple Threat:

- Innovative Architecture
- Design and Build-3 times (Color matching and 4 high)
- Sustainability Upgrades (3)

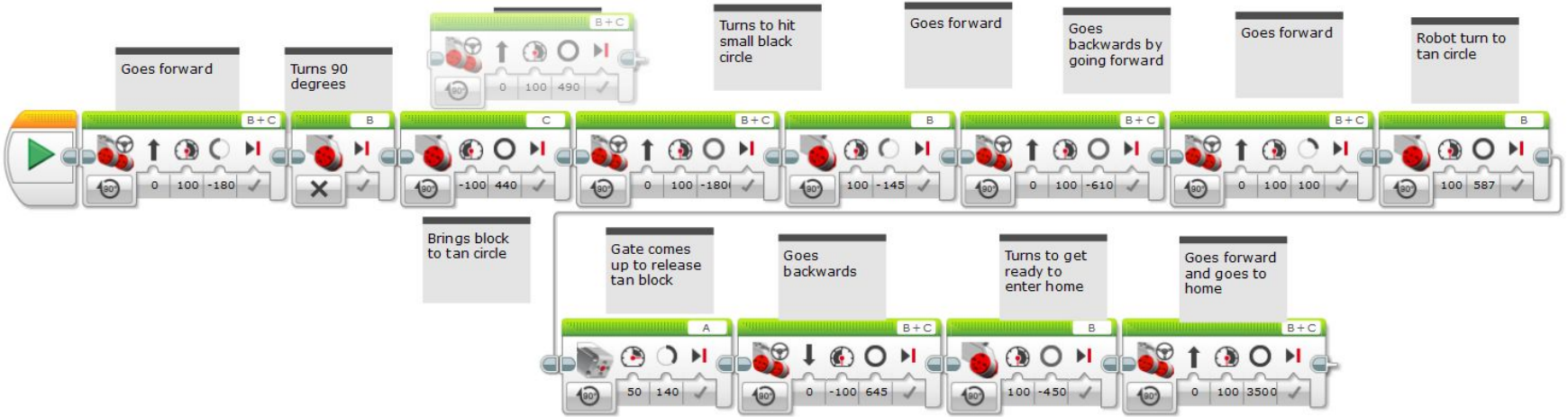
Using the touch sensor to join three missions together.



Crane Mission: First the crane moves, then the blue block is released gently. The robot returns to home and then is relaunched by the touch sensor to push the blue blocks into the blue circle. Lets the blue block down slowly so it doesn't bounce.



Double Trouble
Mission 12 with color matching



We also use technology...

- On our website: https://sparrowbots.weebly.com/
- Songwriting software
- Mission Movies
- Collaborating on Google Docs
- Writing our play
- Researching
- Interviewing Scientists