

Robot Design Presentation

Team #3958

Green Mountain Gears

Arielle Greenblatt, Madeline Greenblatt and Cailin Fitzgerald

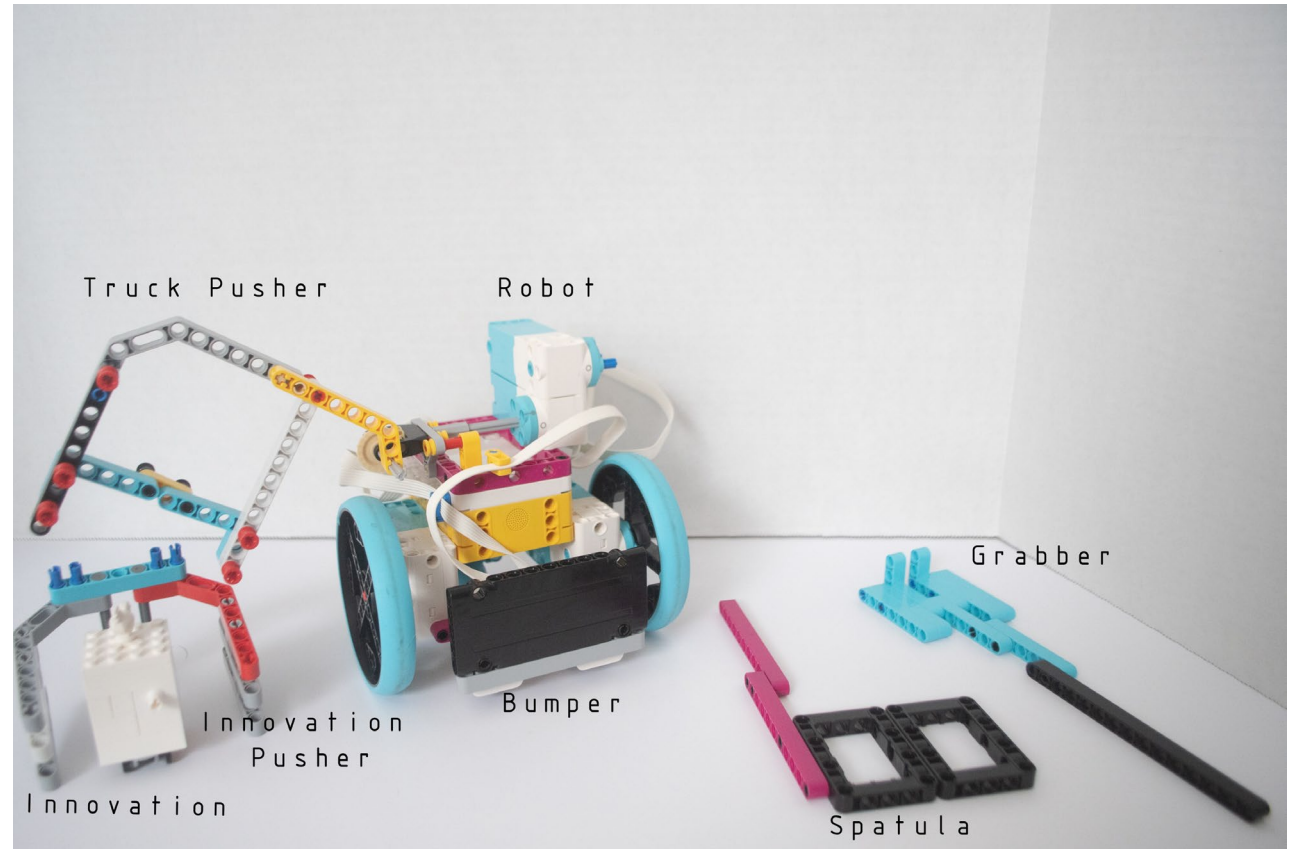
About Us...

- Our team was founded in 2011
- Madeline and Arielle (4th grade) joined this year!
- This is Cailin's 3rd year (5th grade)
- The team competed last year at a qualifying event and NH Regional Championships.



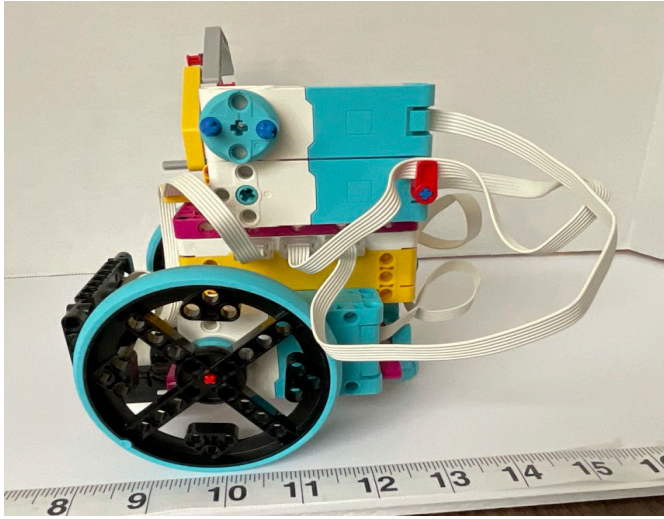
Banana-Mechanical Overview

- Spike
- Spike Prime Programming
- (2) large motors
- (2) small motors
- (2) color sensors
- (front bumper for pushing)
- Grabber attachment
- Spatula attachment
- Truck Pusher
- Innovation Pusher

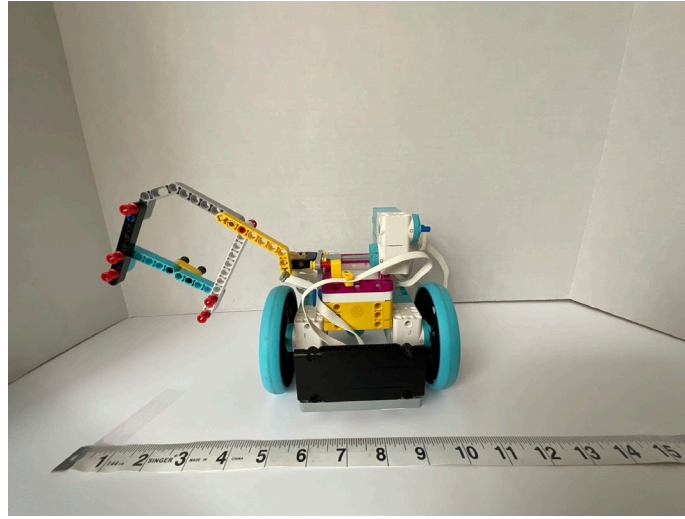


Robot

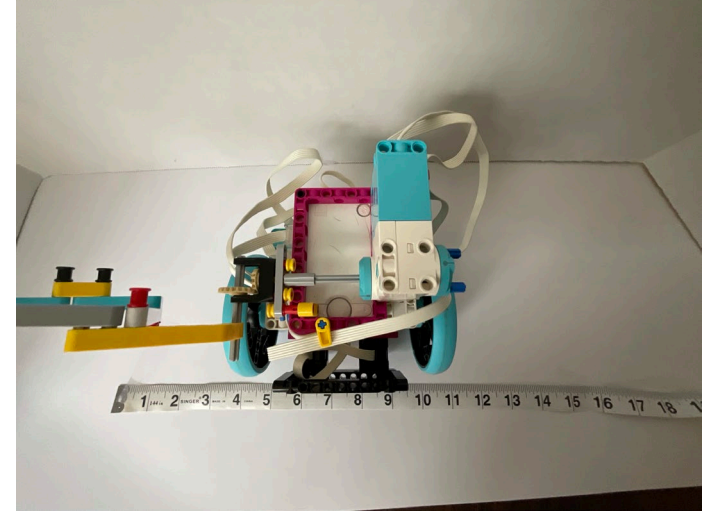
Left



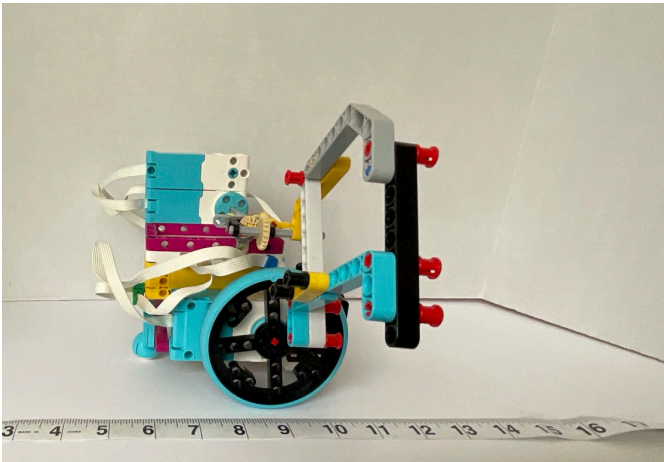
Front



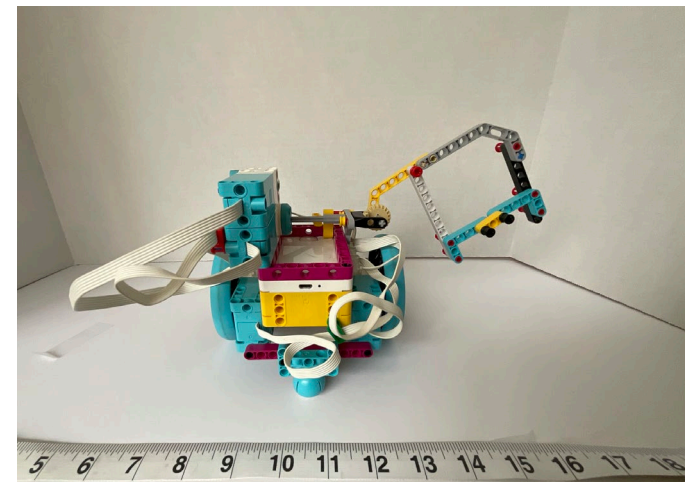
Top



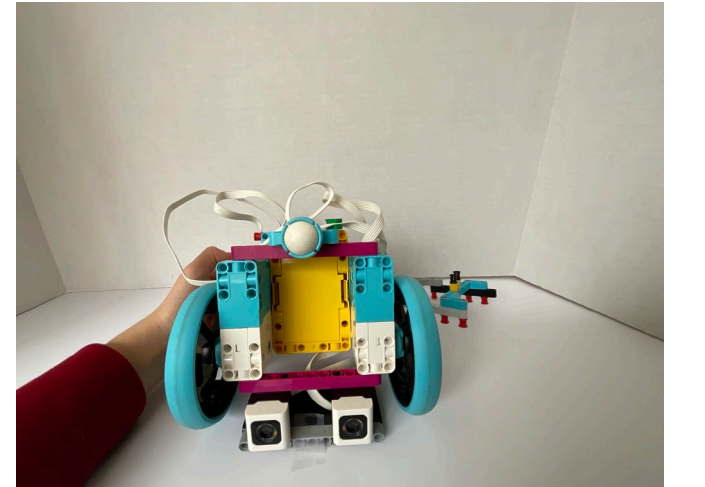
Right



Back



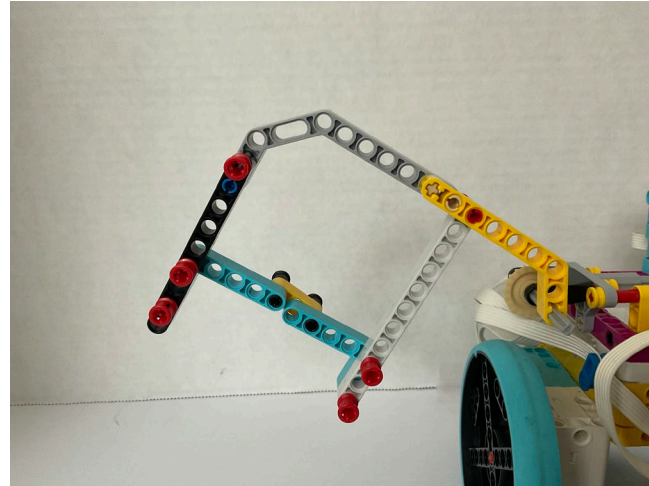
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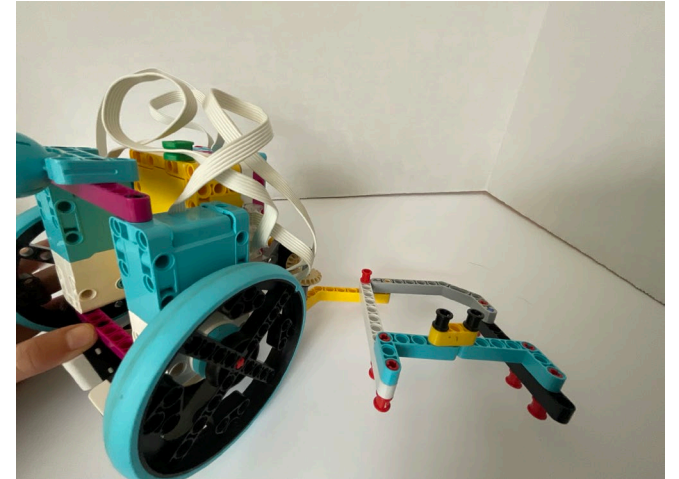
Attachments-Truck Pusher

- Designed and built by Madeline.
- The truck pusher pushes Bob (the front Platooning Truck) to latch to the bridge. It then pushes down the Bridges.

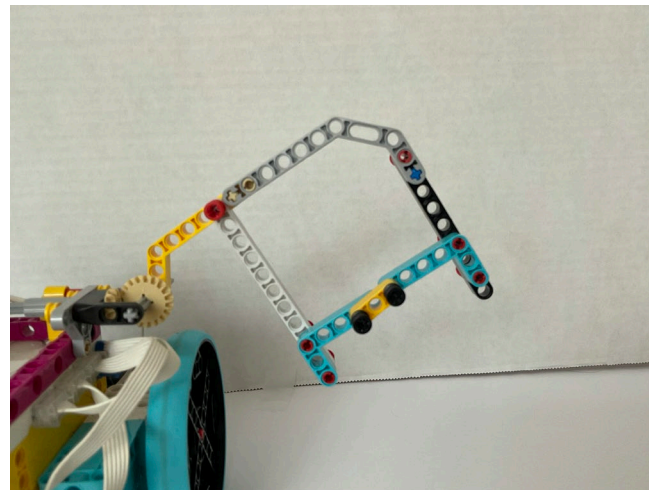
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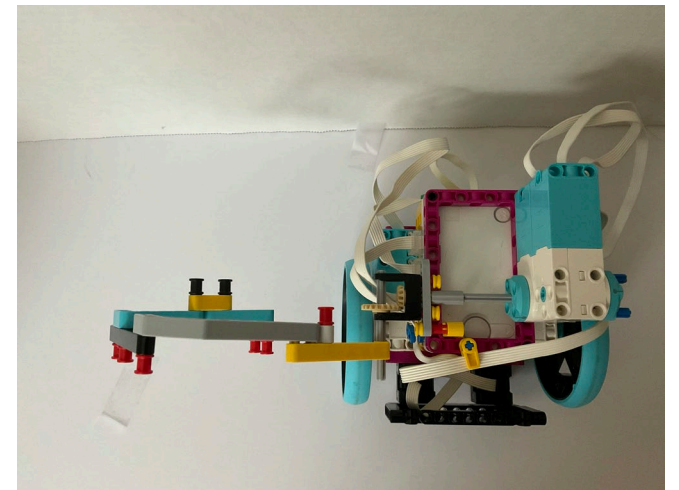
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Back



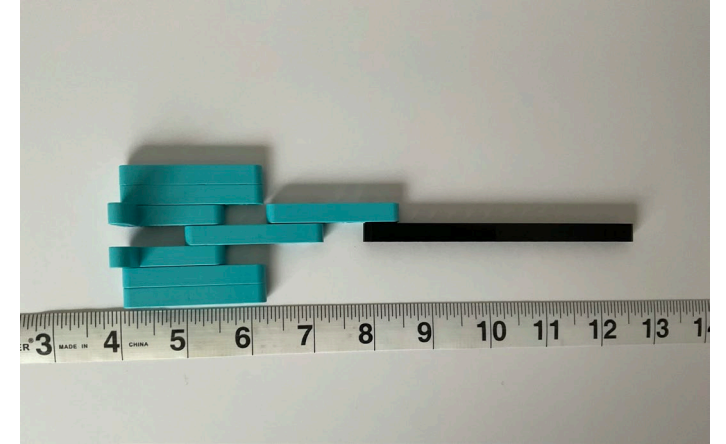
Front



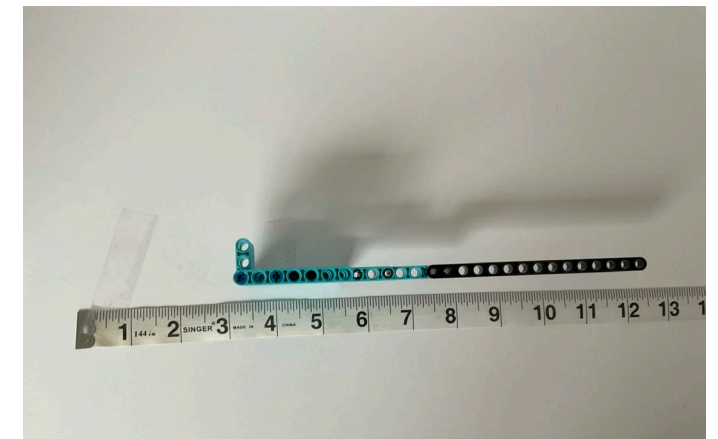
Attachments-Grabber

- Designed and built by Cailin
- The Grabber grabs the locker and pulls it back to home to then be loaded by Madeline.

Front



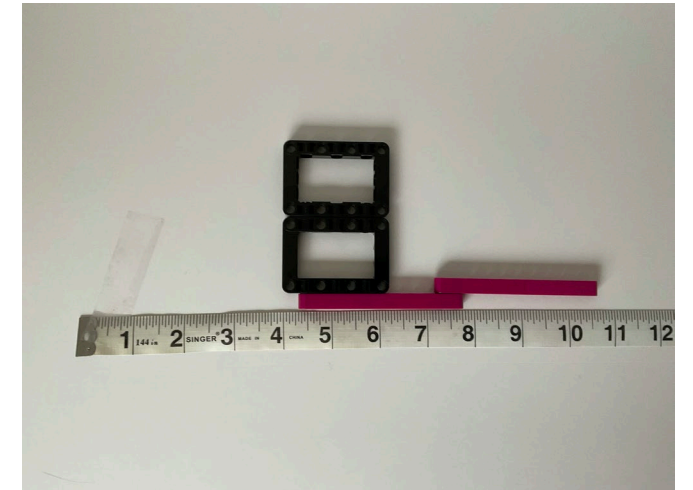
Top



Attachments-Spatula

- Designed and built by Cailin.
- The spatula tugs the cargo plane`s door down and lets the grey container fall.

Front



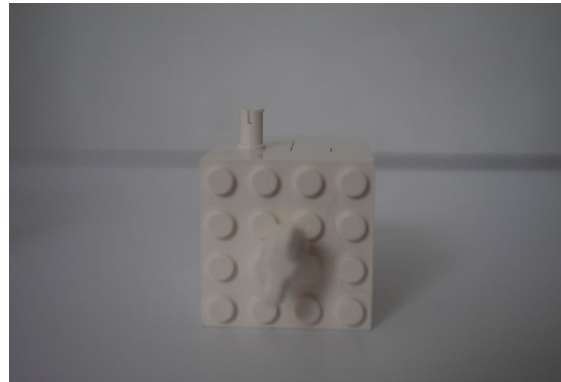
Top



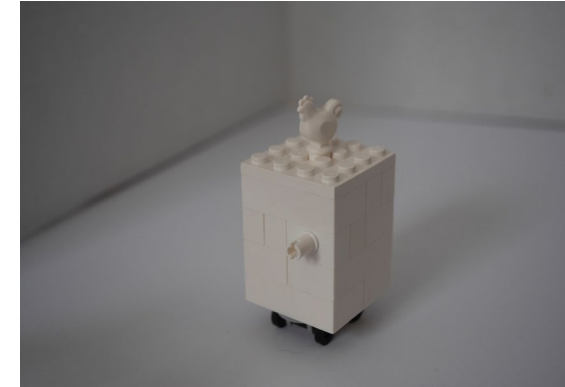
Innovation Chickerator

- Designed/built by Cailin
- The Chickerator is an icebox to store vaccines in.

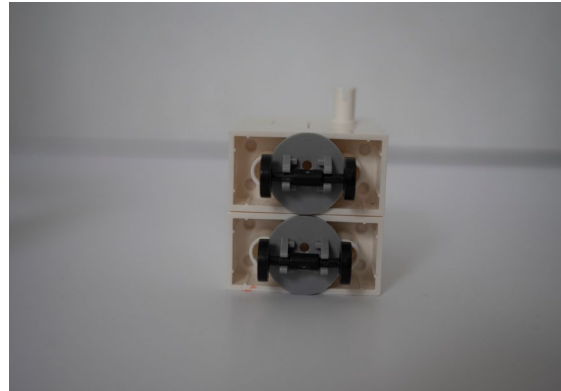
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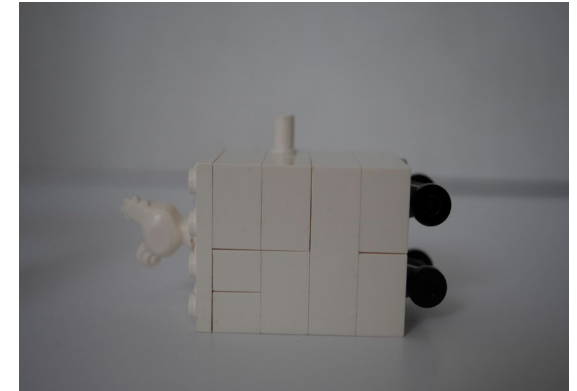
Front



Bottom



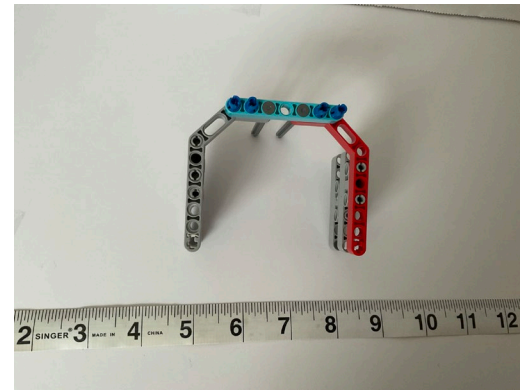
Side



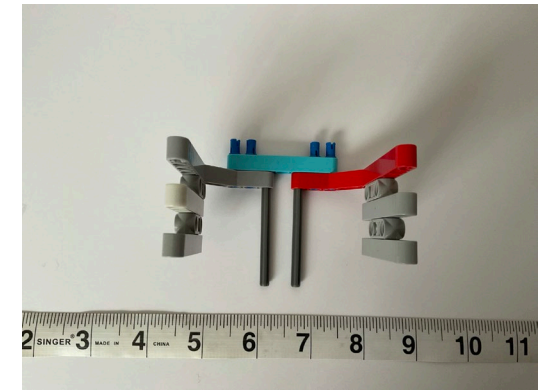
Attachments-Innovation Pusher

- Designed and built by Arielle
- It pushes the chickerator to the cargo connect circe.

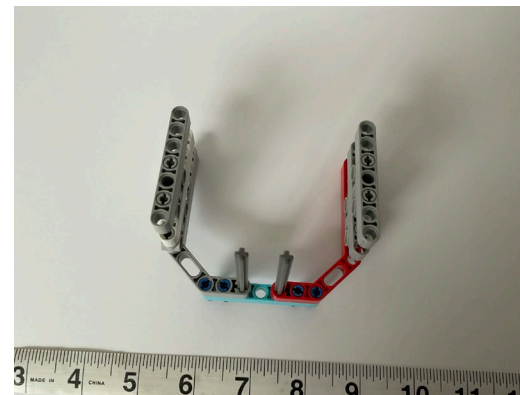
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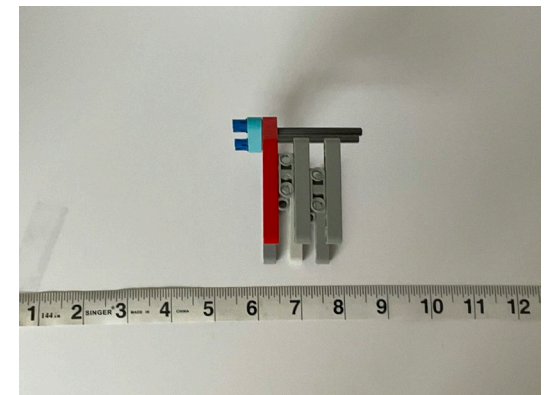
Front



Bottom



Side



Banana-Mission Overview



Sequence	Mission	Title		Points
		Equipment Inspection		
1	M00	Bonus		20
2	M01	Innovation Project Model		20
3	m02	Unused capacity		30
4	m03	Unload cargo plane		30
5	m12	Large Delivery		10
6	m13	Platooning Trucks		30
7	m14	Bridge		20
8	m15	Load Cargo		10
9	m16	Cargo Connect SM		
		partly in 1 circle	1	5
			2	10
			3	15
		completely in 1 circle	1	20
			2	30
			3	40
10	m17	Precision Tokens	1	10
			2	15
			3	25
			4	35
			5	50
			6	50
		Optimal Run		255

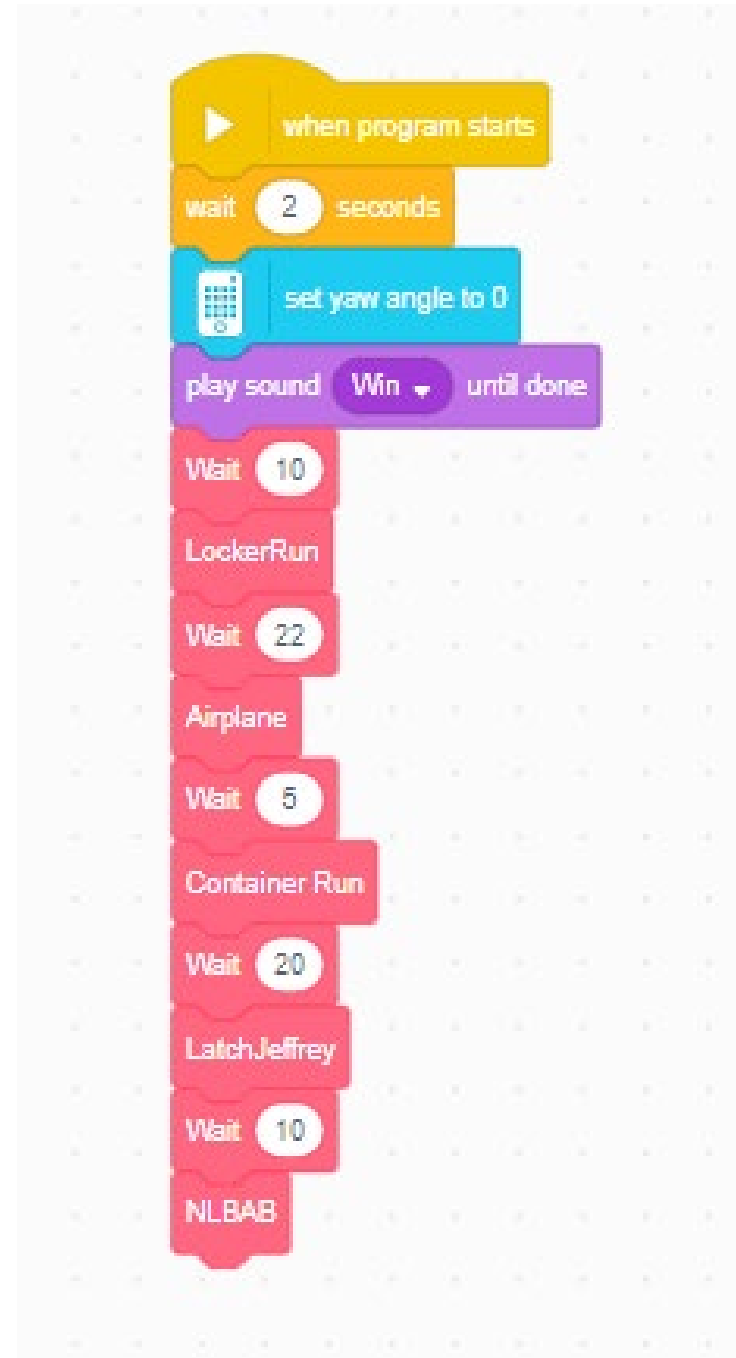
Banana Programming

Master Program-

Once launched, robot cannot be relaunched.

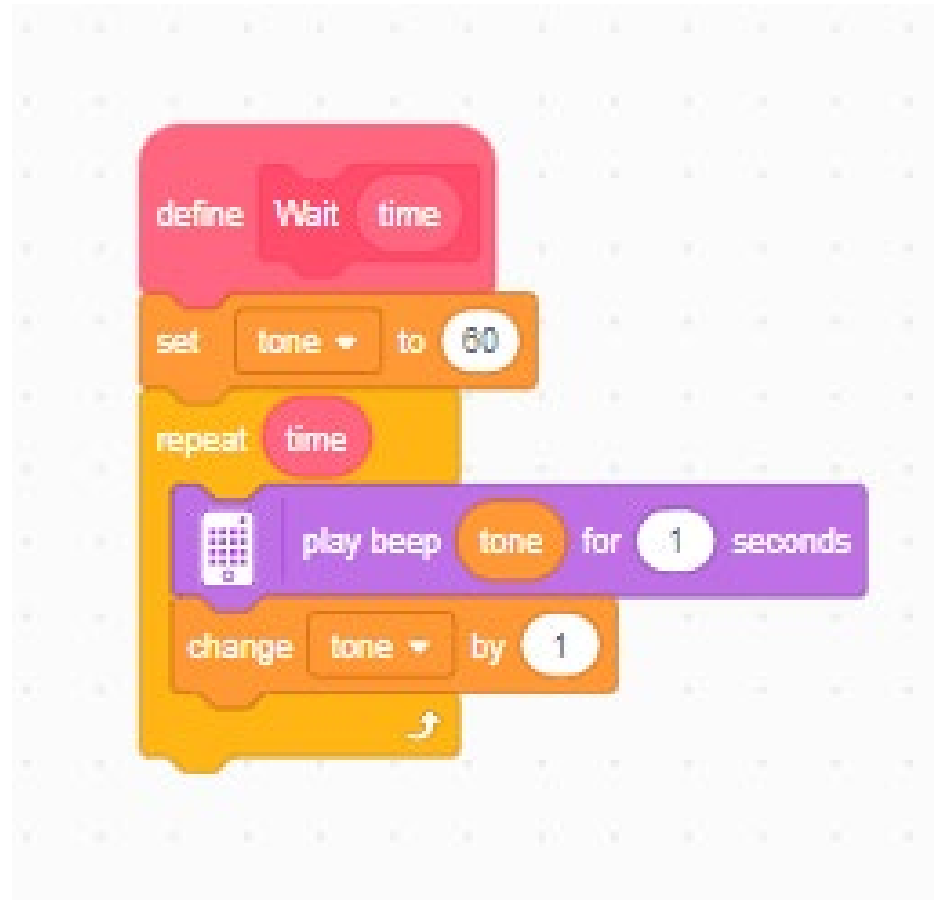
This was a design choice so we did not get stressed
Trying to press buttons and find programs during the
Competition

We adjusted the wait times to make more time for
Some transitions and less time for others.



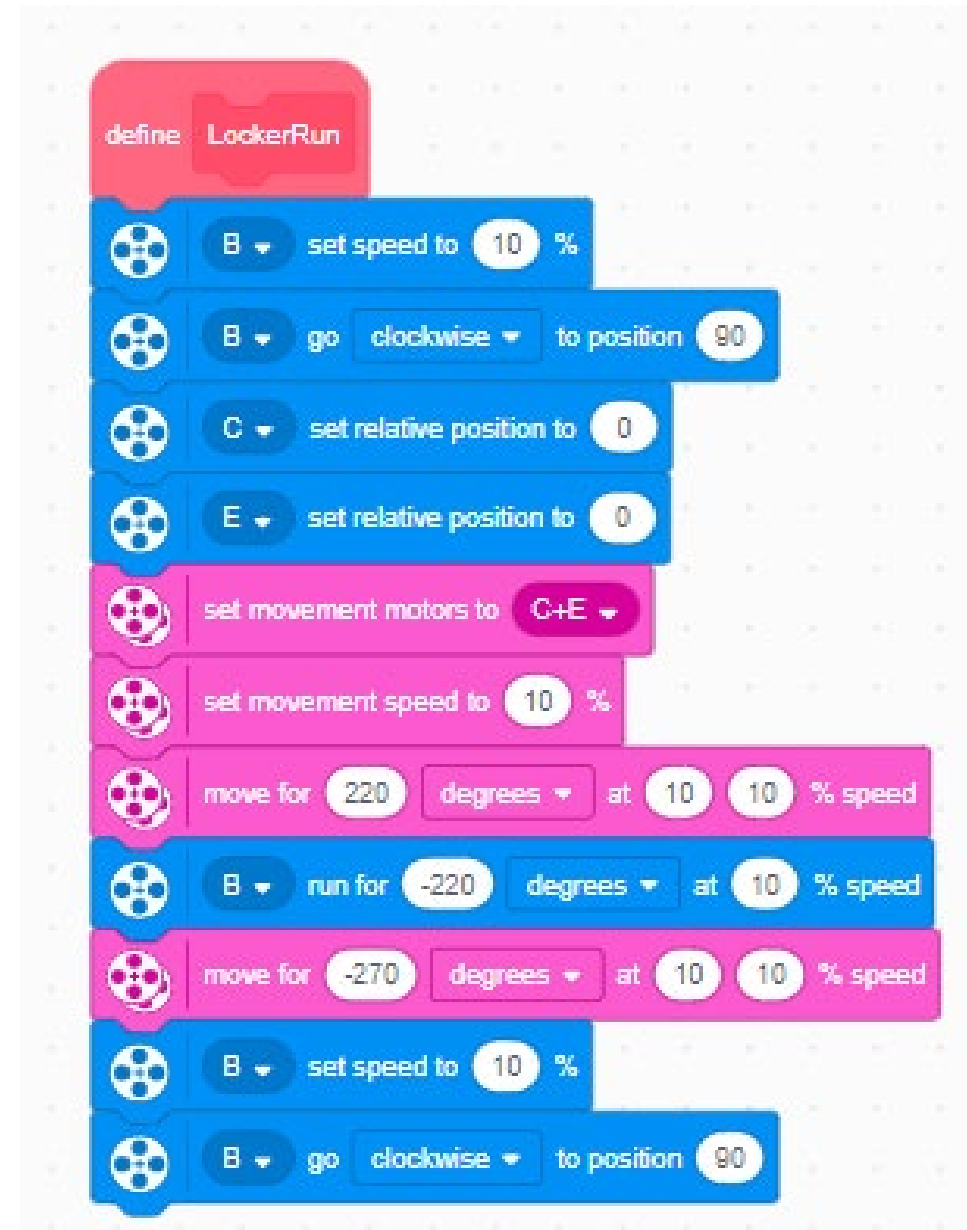
Wait myBlock

- Written 1/16/21
- User can hear the tone (pitch) change as time elapses.
- Takes time as an input
- Used (5) times



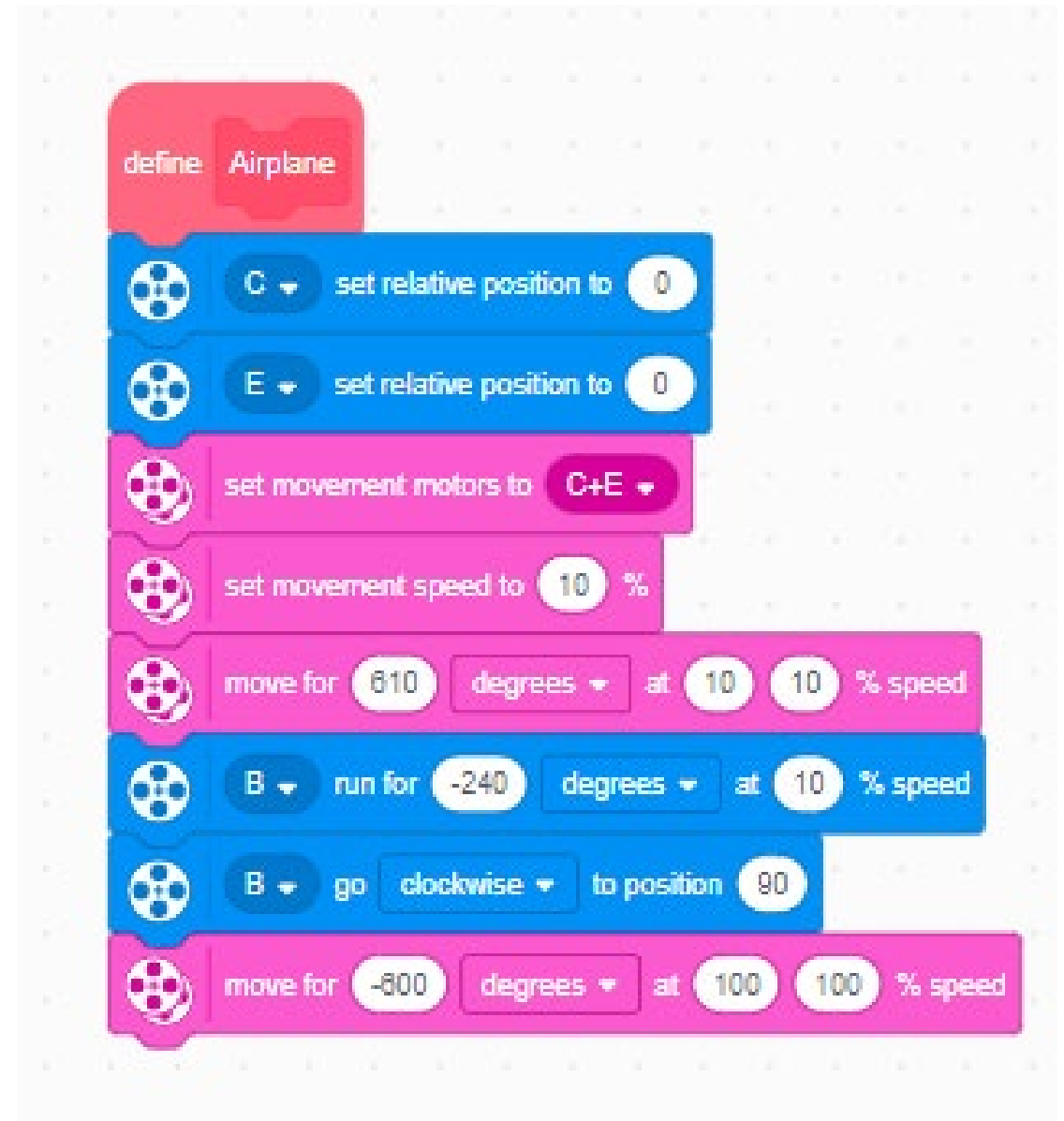
Locker Run

Written on 12/3/21



Airplane Run

- Written on 12/7/21



Container Run

Written 1/17/21

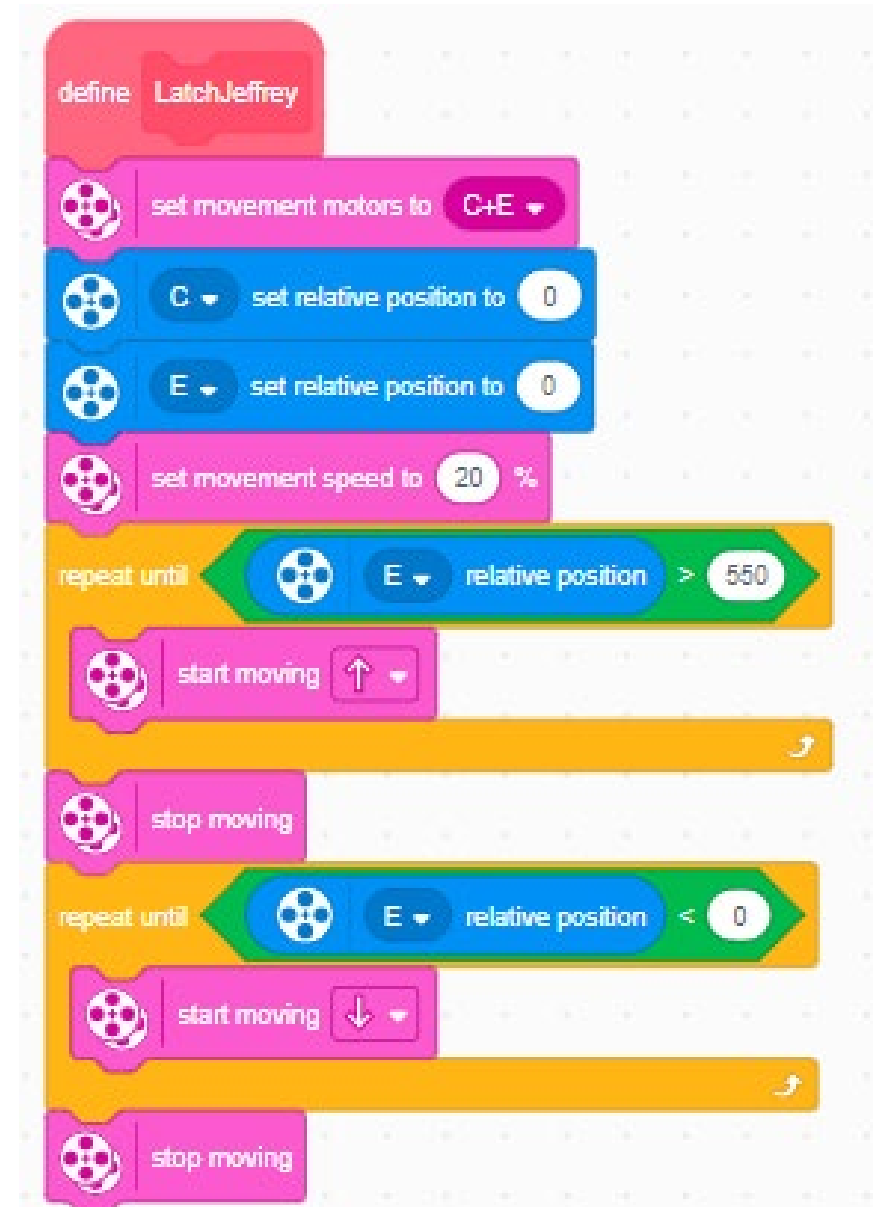
Last minute addition to earn a few more points!!!



Latch Jeffery

Written on 10/18/21

Code is unique and more complicated than more recent code. We learned as we went.



```
define LatchJeffrey
  set movement motors to C+E
  C set relative position to 0
  E set relative position to 0
  set movement speed to 20%
  repeat until E relative position > 550
    start moving ↑
  stop moving
  repeat until E relative position < 0
    start moving ↓
  stop moving
```

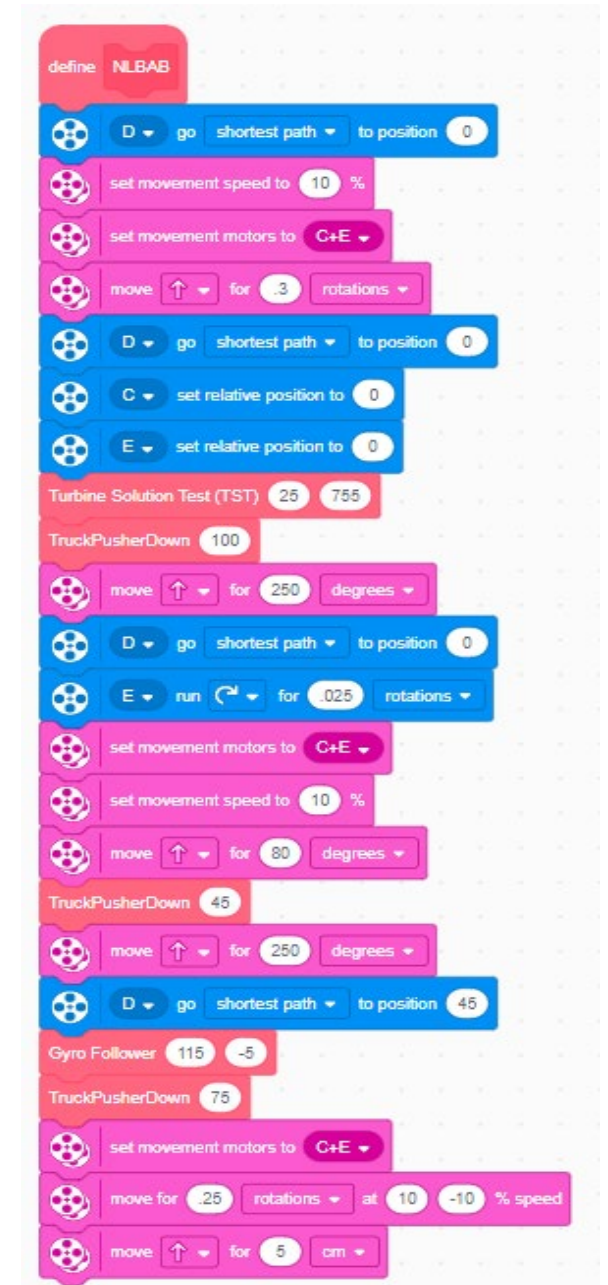
The image shows a Scratch code block for a function named 'LatchJeffrey'. The code is written in a vertical stack of blocks. It starts with a 'define' block for the function. The first block is 'set movement motors to C+E'. The next two blocks are 'C set relative position to 0' and 'E set relative position to 0'. The fourth block is 'set movement speed to 20%'. The fifth block is a 'repeat until' loop with the condition 'E relative position > 550'. Inside this loop is a 'start moving' block with an upward arrow. After the loop, there is a 'stop moving' block. The sixth block is another 'repeat until' loop with the condition 'E relative position < 0'. Inside this loop is a 'start moving' block with a downward arrow. Finally, there is a 'stop moving' block at the end of the function.

NLBAB (New latching of Bob and the bridges)

1/16/21

Revised to make it more consistent.
Uses both Gyro following and line following

Replaced SoloBridges



TST(Turbine Solution Test)

Written at 9/20/21 to get around Larry the chicken

Modified and re-used

```
define Turbine Solution Test (TST) Power Distance
  set movement motors to C+E
  set Base Power to Power
  C set relative position to 0
  E set relative position to 0
  repeat until E relative position > Distance
    set Motor C Power to Base Power * A reflected light - 40 / 60
    set Motor E Power to Base Power - Motor C Power
    start moving at Motor C Power Motor E Power % power
  stop moving
```

The image shows a Scratch code block for a function named "Turbine Solution Test (TST)". The function takes two arguments: "Power" and "Distance". The code starts by setting the movement motors to "C+E". It then sets a variable "Base Power" to the value of "Power". Next, it sets the relative position of motor "C" to 0 and motor "E" to 0. A "repeat until" loop is used, with the condition "E relative position > Distance". Inside the loop, "Motor C Power" is calculated as "Base Power * A reflected light - 40 / 60", and "Motor E Power" is calculated as "Base Power - Motor C Power". The "start moving at" block is used to move the motors with the calculated powers. Finally, the "stop moving" block is used to stop the motors.

Gyro Follower

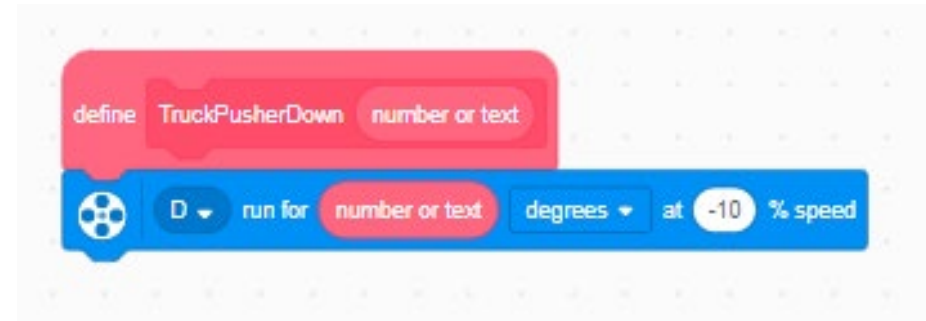
Written on 12/15/21

```
define Gyro Follower distance heading
  E set relative position to 0
  set movement motors to C+E
  repeat until E relative position > distance
    if yaw angle > heading then
      start moving at 0 20 % power
    else
      start moving at 20 0 % power
  stop moving
  set movement motors to C+E
```

The image shows a Scratch code block for a function named "Gyro Follower". The function takes two arguments: "distance" and "heading". The code starts by setting the relative position to 0 and setting the movement motors to C+E. It then enters a "repeat until" loop that continues until the relative position is greater than the distance. Inside the loop, there is an "if" statement that checks if the yaw angle is greater than the heading. If true, it starts moving at 0 degrees and 20% power. If false, it starts moving at 20 degrees and 0% power. After the loop, it stops moving and sets the movement motors to C+E.

Truck Pusher Down

Written on 10/4/21



Best Scoring Run!!! 255 points!!!!

- <https://youtu.be/Hw3f1hajK7Y>



Robot Design Process

- Select Missions
 - Navigation (close, waypoints, landmarks)
 - Actions to complete (passive versus active)
- Design Robot to accomplish missions