Somerset Berkley Regional High School

Jacob Carpenter and Andrew Morin

Robotics Engineering with LabView

Objective: To support the development of metacognitive skills and habits of reflection for effective problem solving

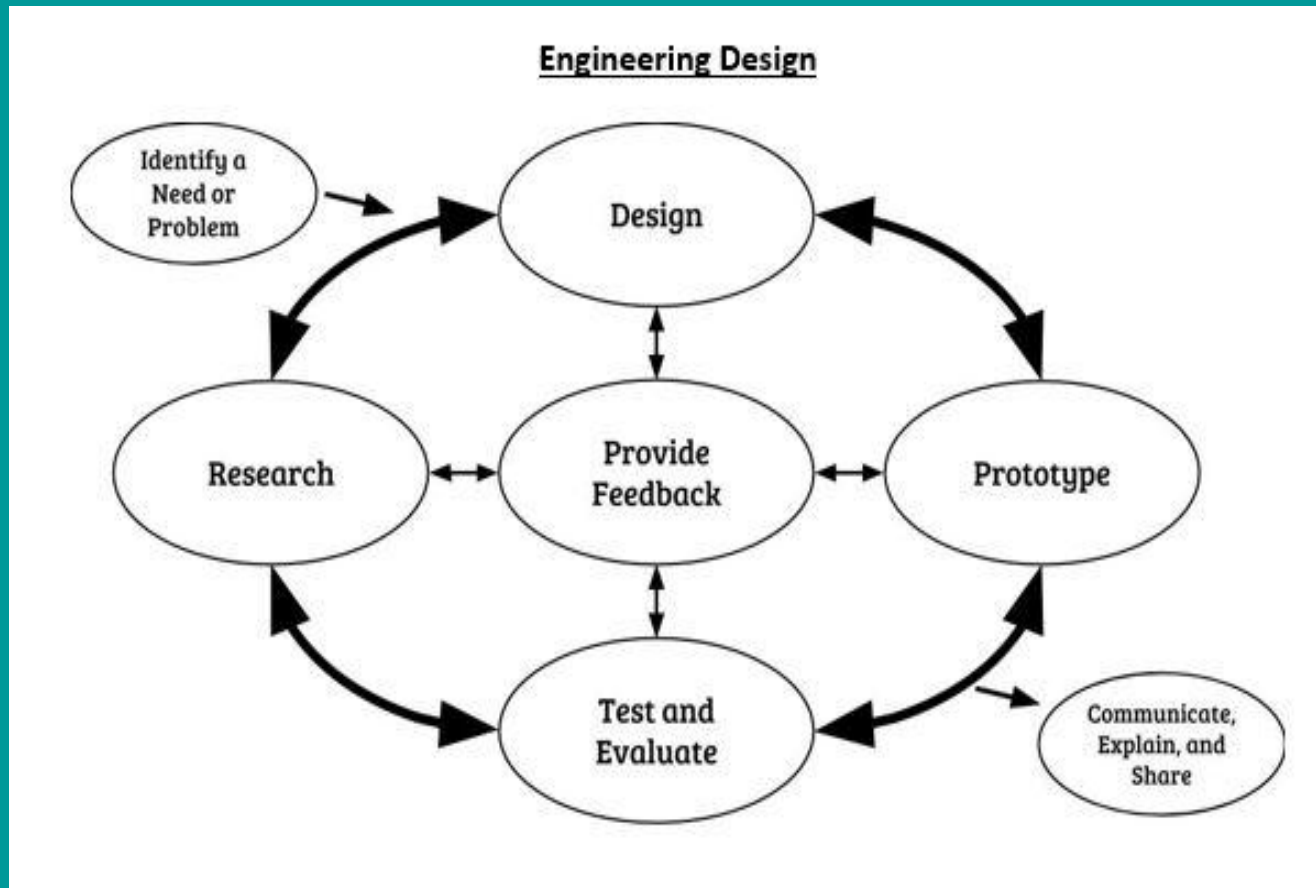**Planning ; What should step one be? What do I know about the problem?**

Goal setting Set realistic goals. How much time do I have?
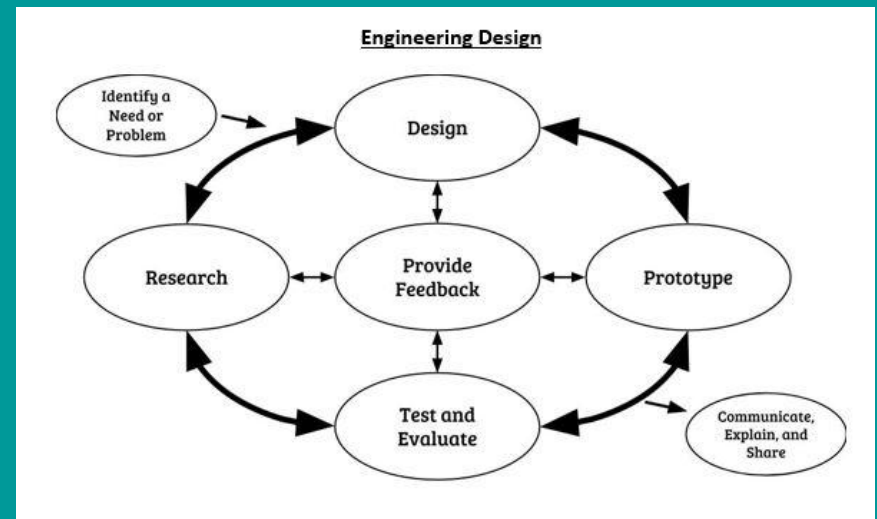
Monitoring progress Am I on the right track?

Adjusting What did I learn. Did I get the results I was expecting? If I could do this over again I would…….

Engineering Design Process

2016 Revised Massachusetts State Framework
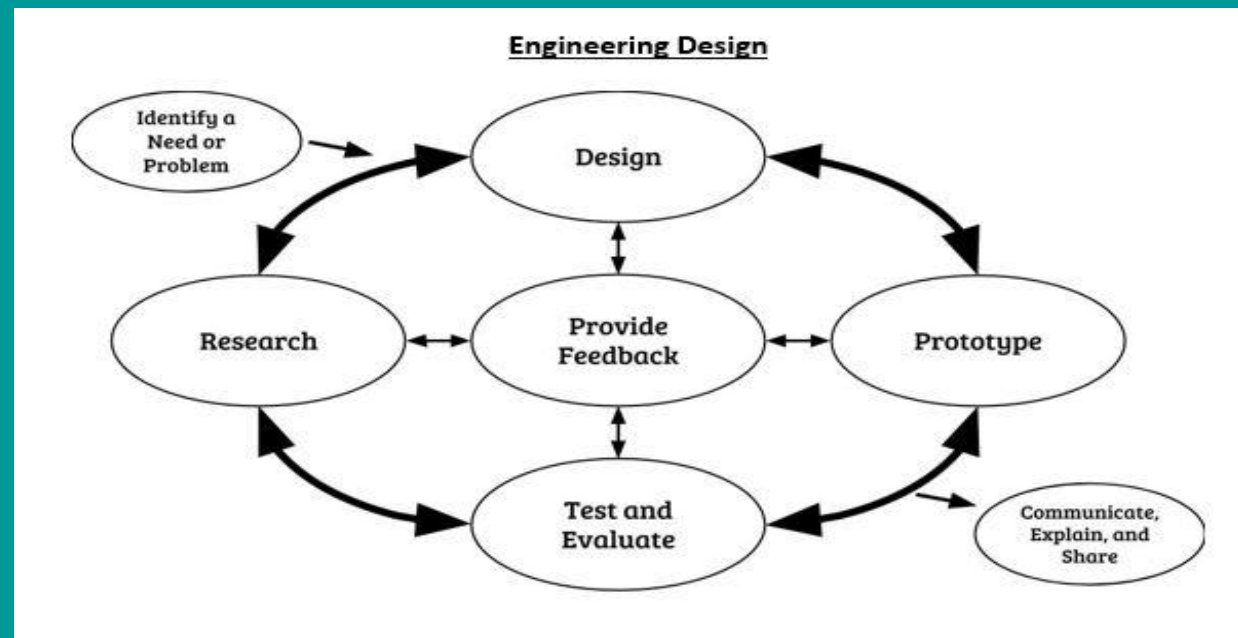
Identify the need or problem

Identify a need or a problem. To begin engineering design, a need or problem must be identified that an attempt can be made to solve, improve and/or fix. . This typically includes articulation of criteria and constraints that will define a successful solution.

Evidence : Add slide and describe what you already know about the problem. This helps to build an understanding of the problem
Describe the knowledge you will need to solve this problem.

The first problem is to get the robot to go up a wooden plank at a 90 degree angle. We need to know how to build a robot that can go up a vertical angle. The second problem is carrying a ball and dropping it in a cup.

Research the problem

Engineering Design

Research. Research is done to learn more about the identified need or problem and potential solution strategies.
Decide what information is needed.
What should step one be?
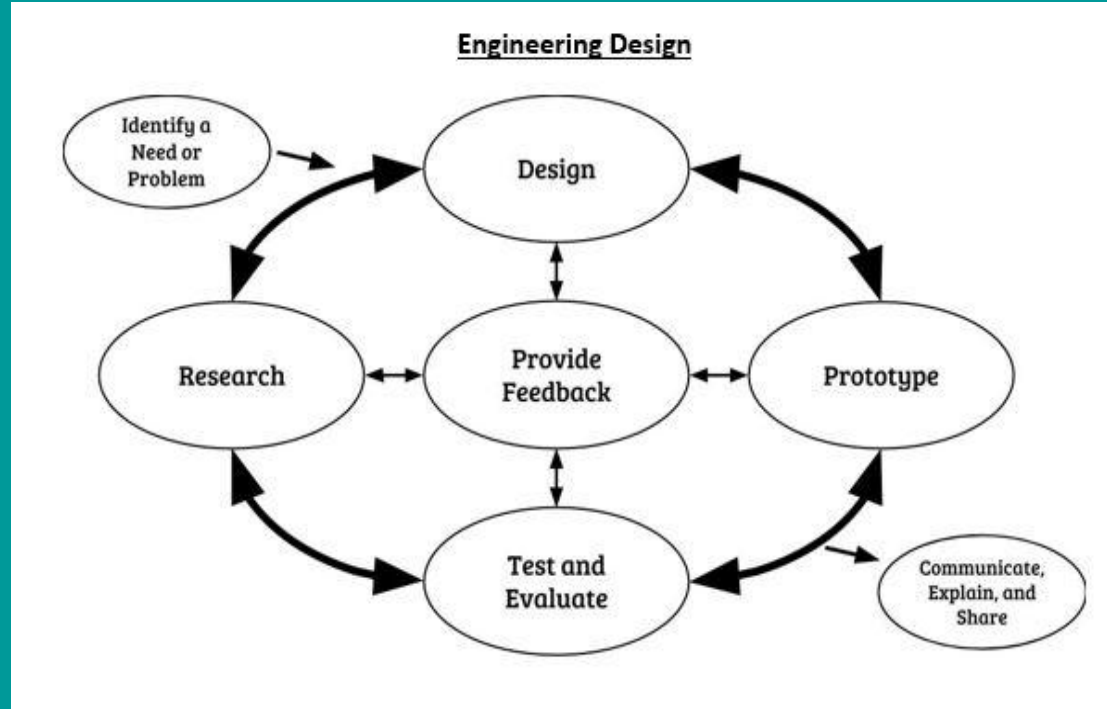Use appropriate tools and strategies to access the information
Analyze the information gathered and its sources.
If there is more than one good answer to the problem,
list the positives and negatives of each of the findings.
On your PowerPoint file show add a slide to show what you did for research. *__Evidence__*

The information needed is to understand how the robot can go up a vertical angle. Step one should be building the robot to stay on the board without falling, next should be programming the robot to go up the board and down the board. The third step should be building a cup to carry a ball and drop it in another cup

Design

Engineering Design

Identify a Need or Problem → Design

Research — Provide Feedback — Prototype

Test and Evaluate

Communicate, Explain, and Share

Design. All gathered information is used to inform the creations of designs. Design includes modeling possible solutions, refining models, and choosing the model(s) that best meets the original need or problem.

Evidence :Clarify the roles of each team member, taking advantage of individual strengths.
 List the role of each member on the team

Programmer: Andrew Morin
Builder: Jacob Carpenter
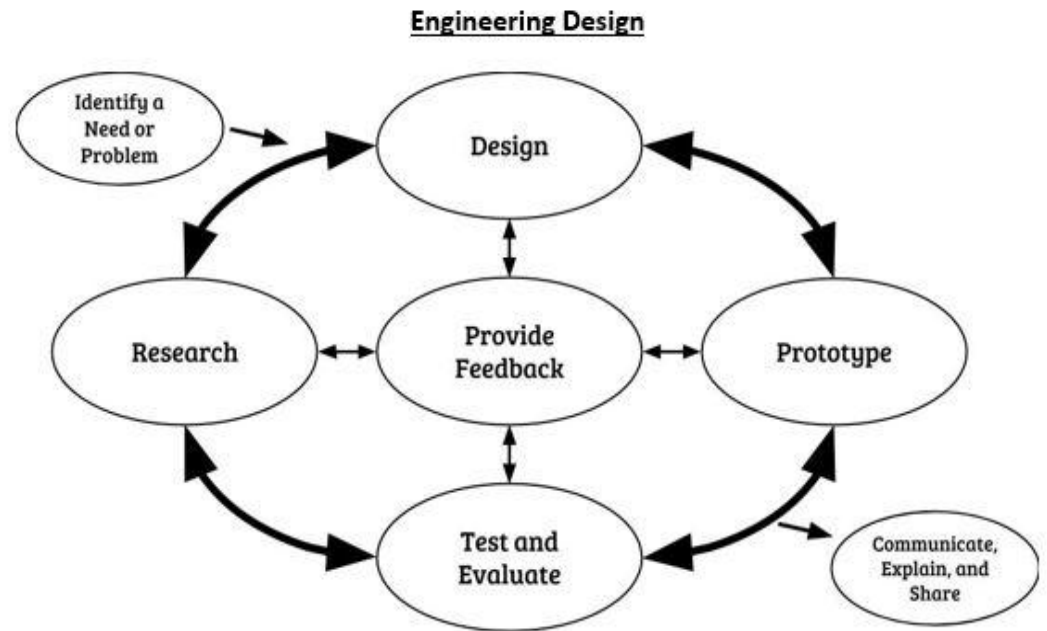
Prototype

Engineering Design
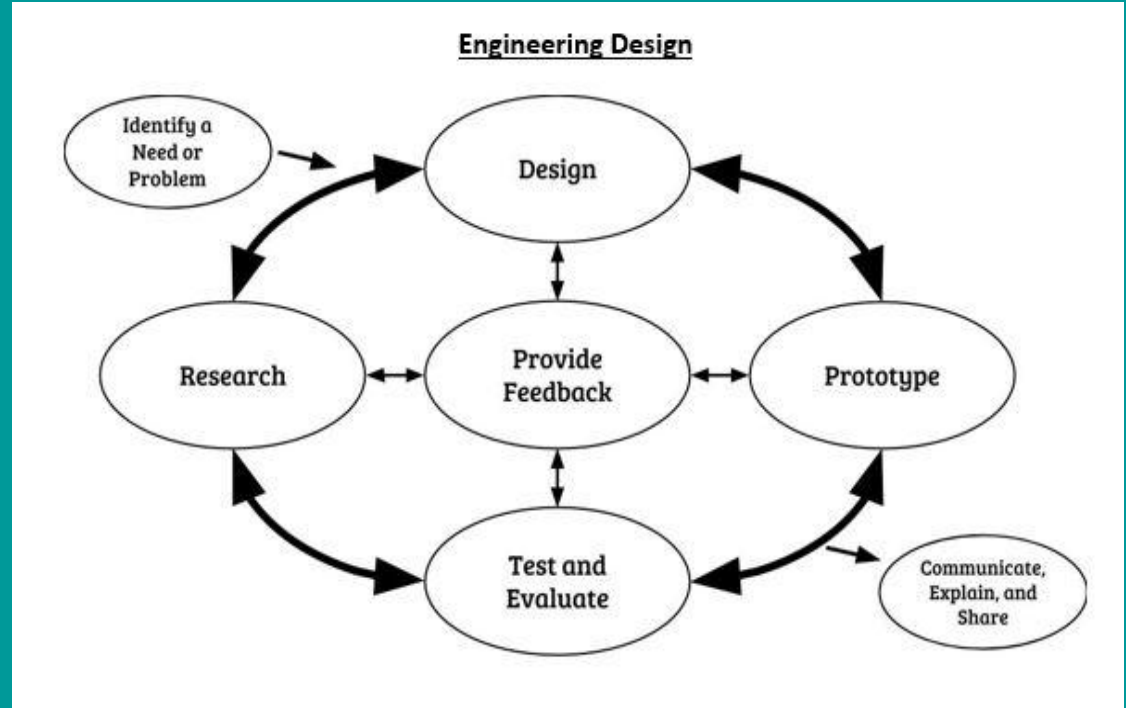
A prototype is constructed based on the design model(s) and used to test the proposed solution. A prototype can be a physical, computer, mathematical, or conceptual instantiation of the model that can be manipulated and tested.

Evidence : Execute the plan, (build your robot) modifying as needed.

Engineering Design
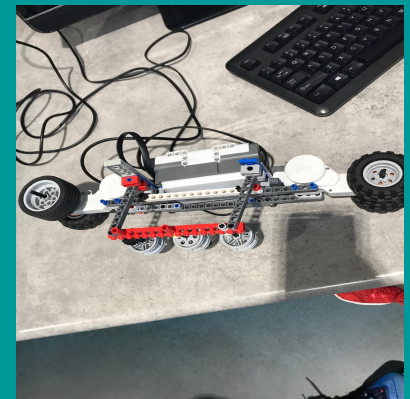
Test and evaluate

The feasibility and efficiency of the prototype must be tested and evaluated relative to the problem criteria and constraints.
Collaboratively decide whether the solution needs more work and repeat previous phases as needed.
1.   Does your robot work?
2.   Did it perform as expected?
3.   What changes are necessary for the robot and the program?
4.   Does it meet the original design constraints?
5.   Is it safe?
6.   Students discuss what they liked best about the collaborative process and what could be done differently next time.
7.   Students present their solution to the other teams and celebrate the work of the problem solvers
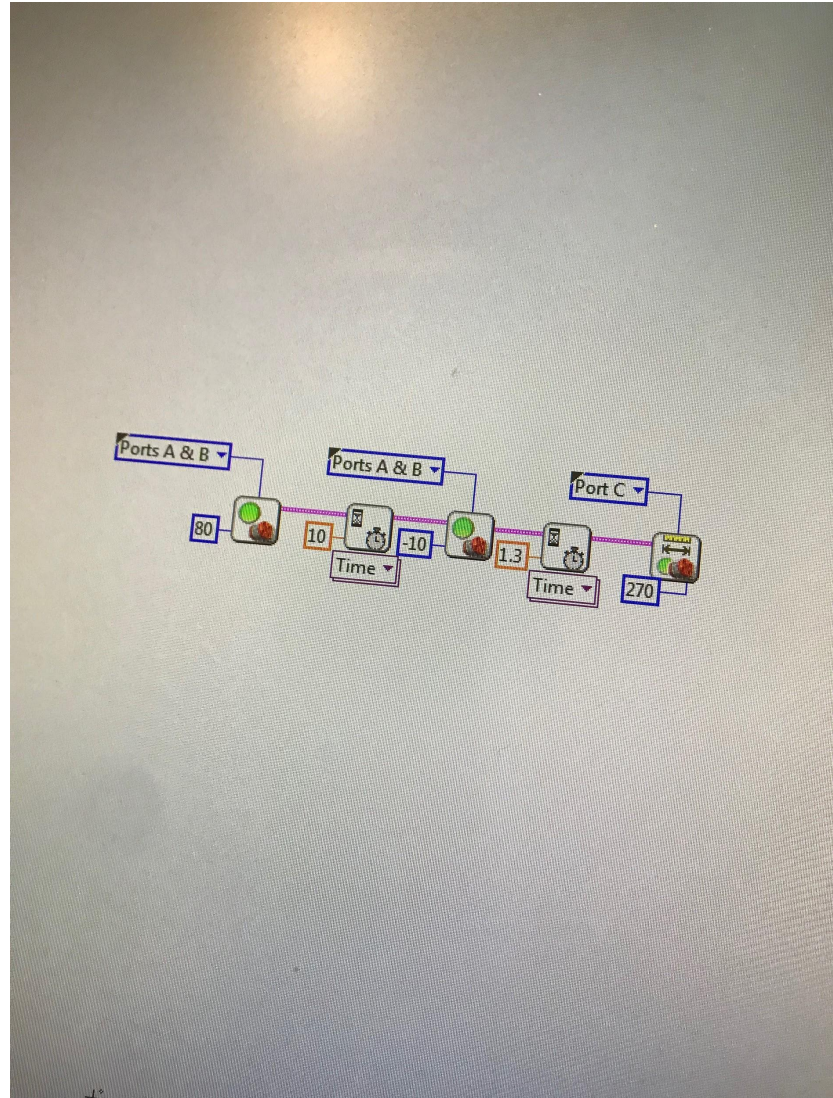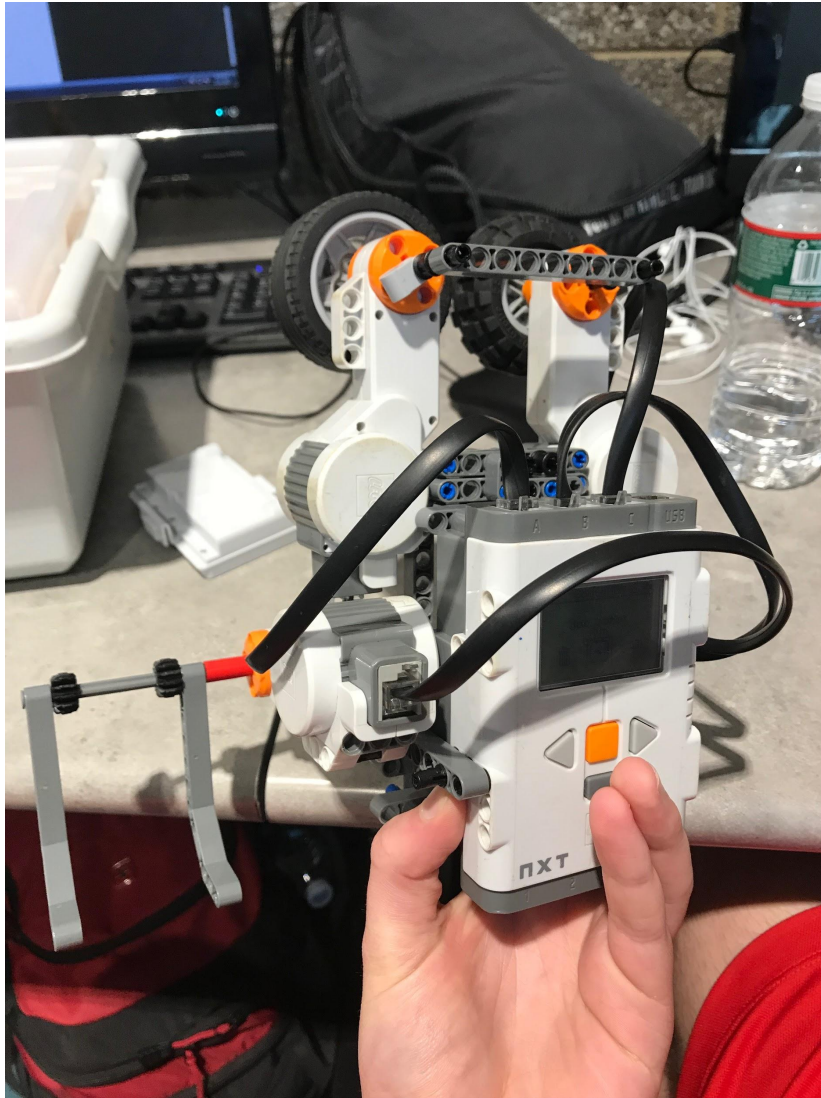
Evidence

Prototype picture and computer program
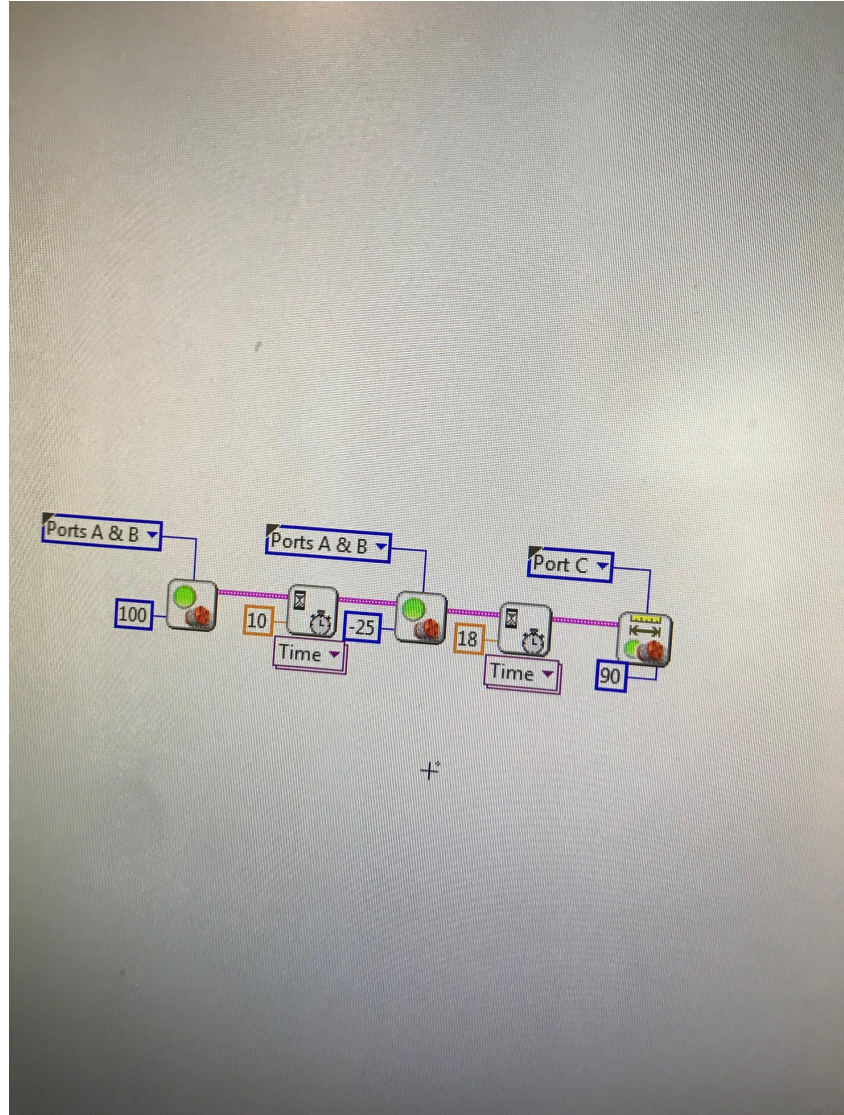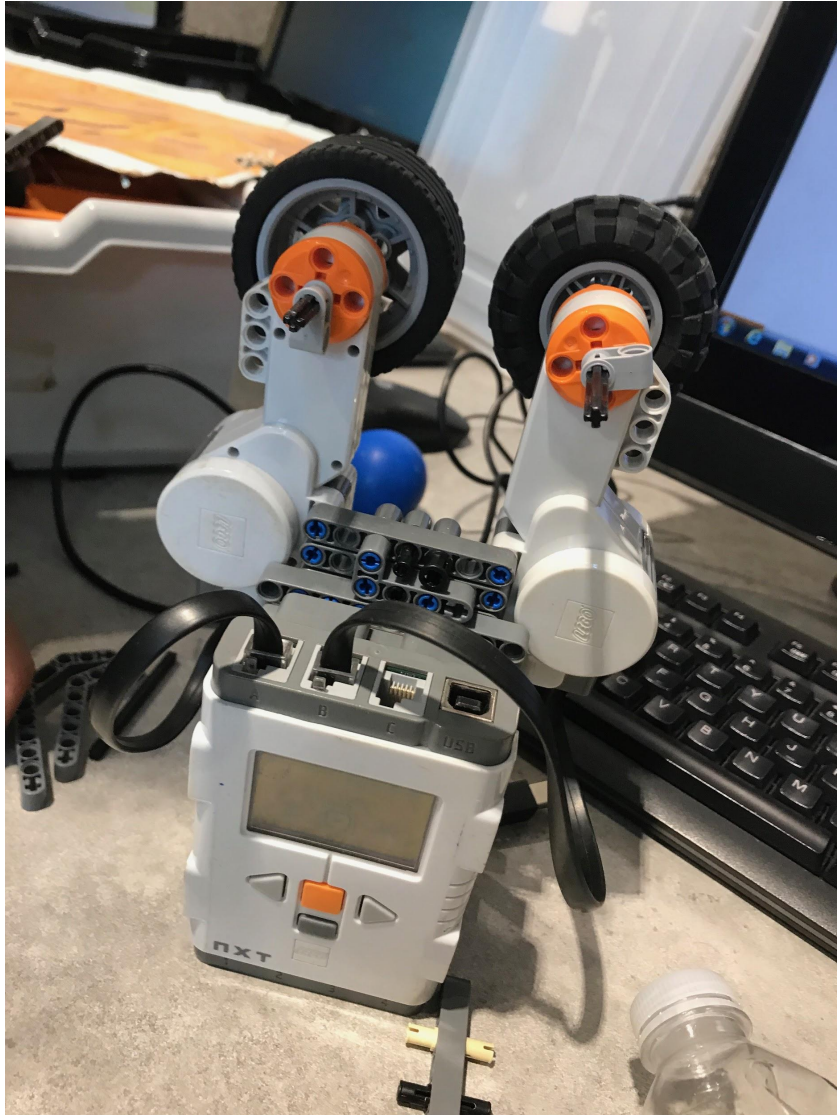
Evidence

modified prototype picture and computer program

Communicate the solution(s)

Provide the YouTube link of your video that shows how your robot meets the challenge.

YouTube video link :
https://www.youtube.com/watch?v=9uI6JtzQNgQ&list=PLX
W_UUDvb14k7M69weuT9UqmrylB4y_eu

Reflection

Think about your professional destination. What skills and or knowledge are you going to need that you don't have or have enough of. Add a slide and make a list Reflect on your latest assignment in robotics and describe how what you just did supports what is on your list.

- Problem solving
- Metacognitive thinking
- Perseverance

The last assignment in robotics proves this list in every aspect. For problem solving, is just being able solve the problem and figuring out how to create a robot that can go up a vertical angle. It helped metacognitive thinking because you think about what you've built or are building and realize how you can make it better. Lastly, perseverance is because of not giving up after multiple prototypes don't work and go up a vertical angle and getting the ball in the cup

Letter to a future student

Take a few minutes to think of a time when you overcame a struggle in robotics class.
 Reflect on the times when you failed at first but through persevering your brain created new neural connections and you eventually became better at the task at hand. Briefly describe this experience in a letter to a future robotics student.

There were multiple times i've struggled in robotics class. During this product, the main struggle was getting the robot to go up the wooden plank at a 90 degree angle. It took us awhile to build the right robot with the right program. Most of the problems include the robot falling off the board, the robot not coming down without falling off, and getting the ball in the cup.

Take a look at your Weebly website. How has your thinking changed as you progressed through robotics engineering?

My thinking has changed as robotics has processed over time by how to solve the problem. At this point we already have the robot built and understand what parts need to be modified to change the situation into the right way. We also know the general building of the programming now.

Instructions for posting to Weebly

1. Go to file->download file and then choose PDF document (.pdf).

2. Then on your weebly website under Build Media section drag the file option and upload the PDF of your Slides presentation to your website