

# Somerset Berkley Regional High School

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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?**

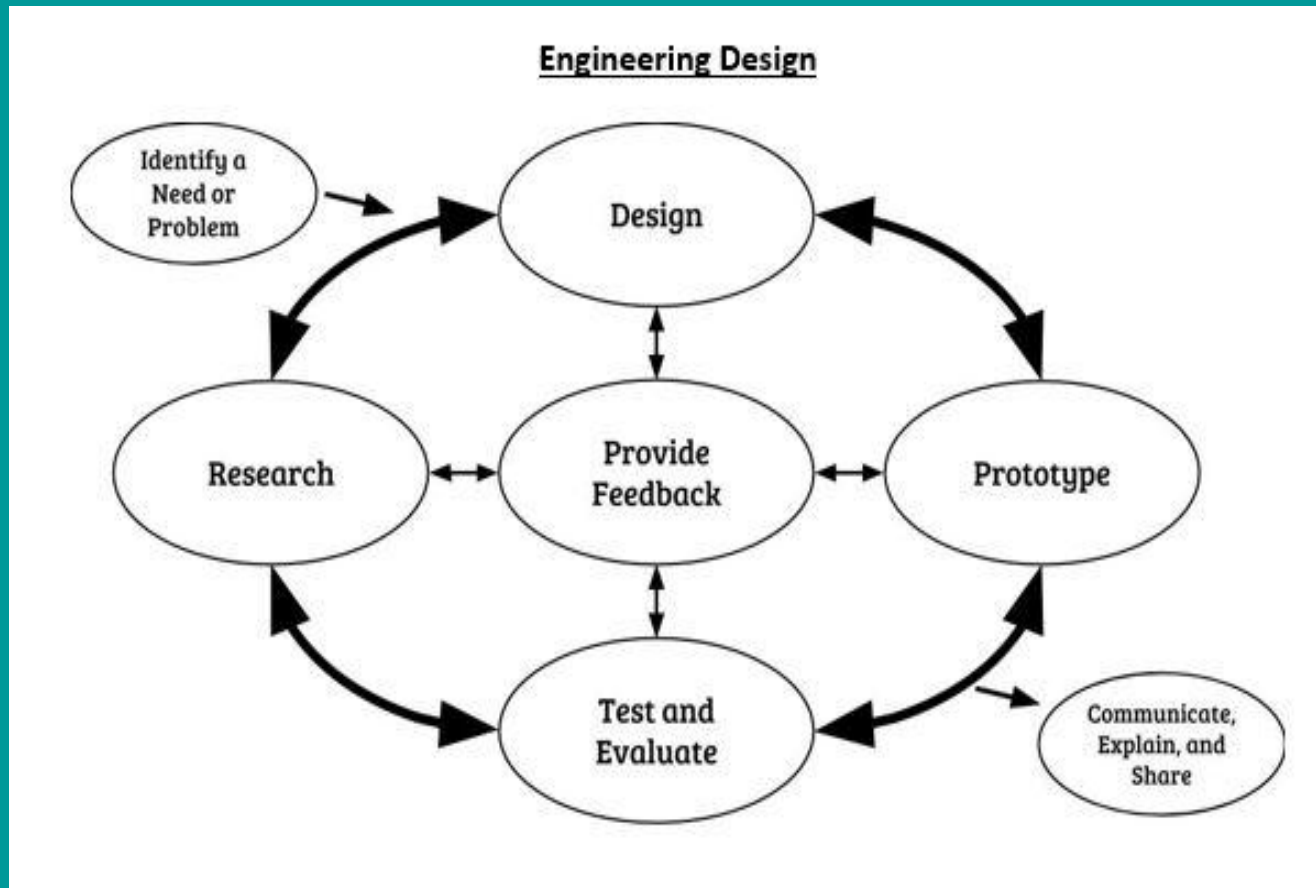
**Goal setting Set realistic goals. How much time do I have?**

**Monitoring progress Am I on the right track?**

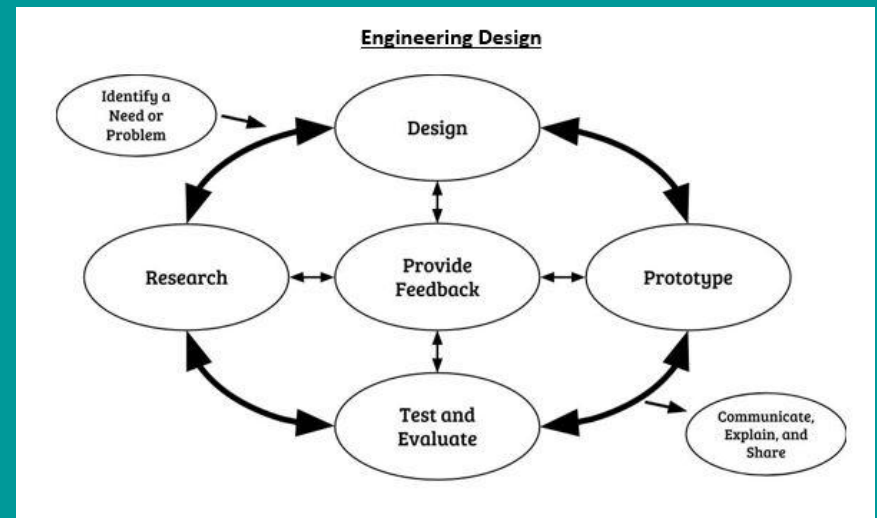
**Adjusting What did I learn. Did I get the results I was expecting?  
If I could do this over again I would.....**

# Standard 1.1 Engineering Design Process

2016 Revised Massachusetts State Framework



Identify the need or problem



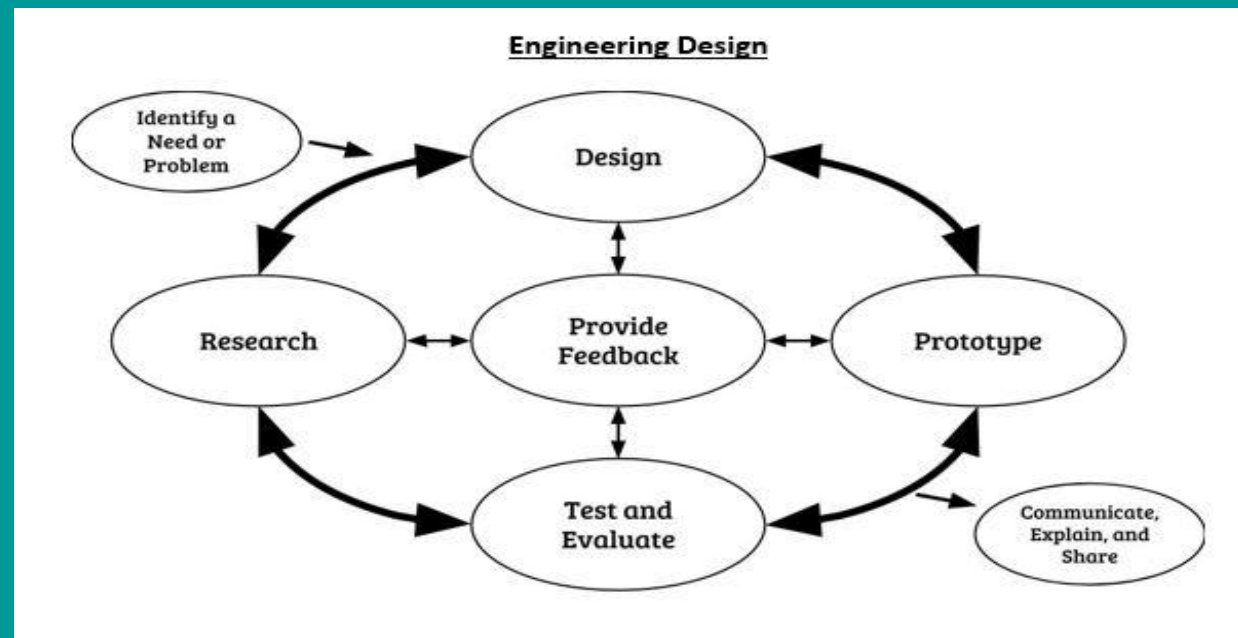
**Identify a need or a problem.** To begin engineering design, a need or problem must be identified that an attempt can be made to solve, improve and/or fix. . This typically includes articulation of criteria and constraints that will define a successful solution.

**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 and identify the constraints.**

- i already know that we need to get a robot too climb the verticle wall.
- i also know that i will need too completely reassemble my robot

Research the problem



**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

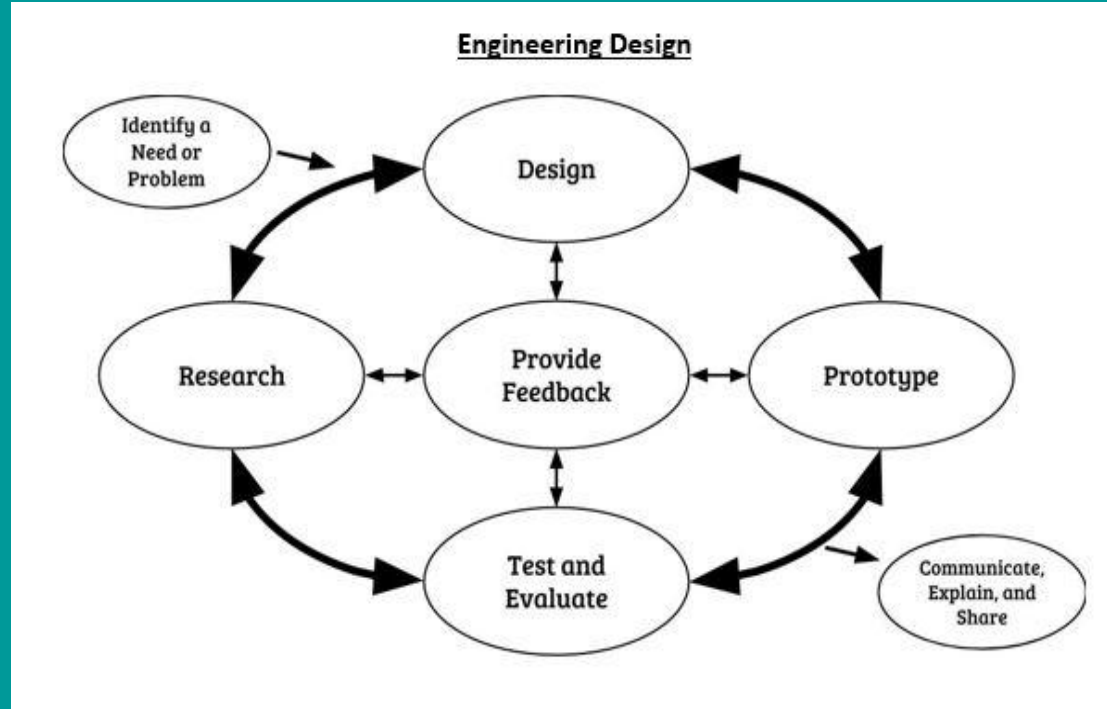
Analyze the information gathered and its sources.

If there is more than one good answer to the problem,

*On your PowerPoint file show add a slide to show what you did for research. **Evidence***

- for the first part of our analization i measured the the distance across the board so we can assemble the robot correctly.

# Design



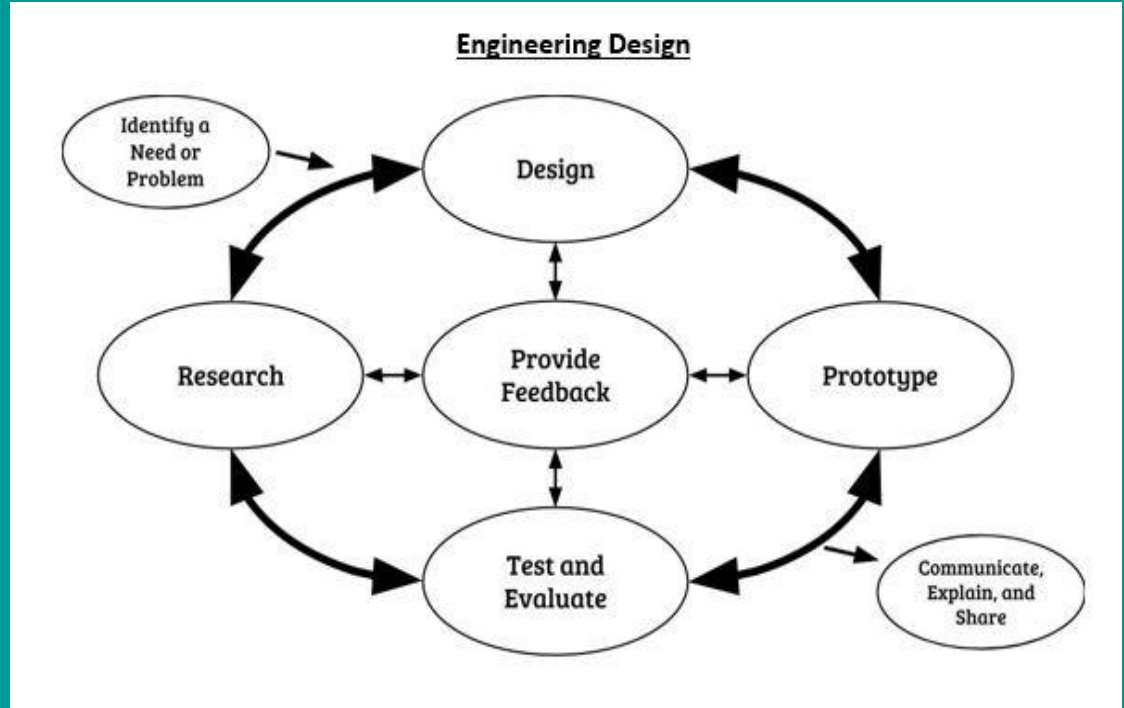
**Design.** All gathered information is used to inform the creations of designs. Design includes modeling possible solutions, refining models, and choosing the model(s) that best meets the original need or problem.

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



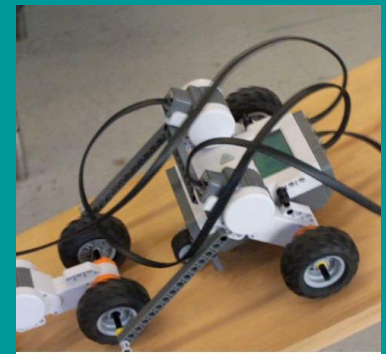
- I did the programming while my partner did the building and assembling
- I am good at programming while Nick is good at building

# Prototype



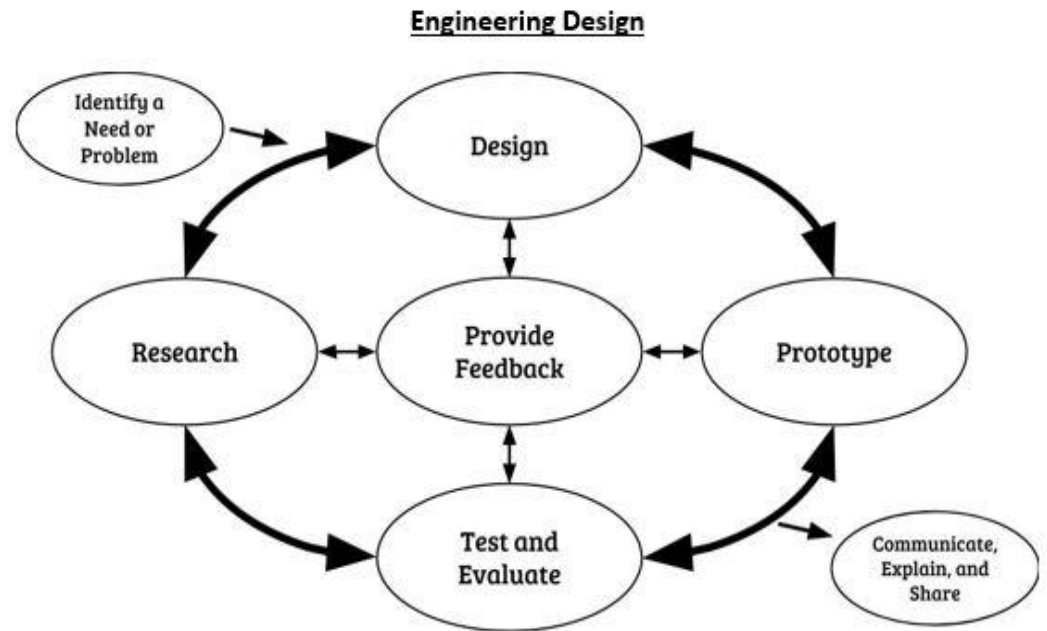
A prototype is constructed based on the design model(s) and used to test the proposed solution. A prototype can be a physical, computer, mathematical, or conceptual instantiation of the model that can be manipulated and tested.

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



- first, we took our robot apart, then we assembled the robot so that it successfully climbed the vertical wall and dropped the ball in the box at the botto.

# Test and evaluate



The feasibility and efficiency of the prototype must be tested and evaluated relative to the problem criteria and constraints.

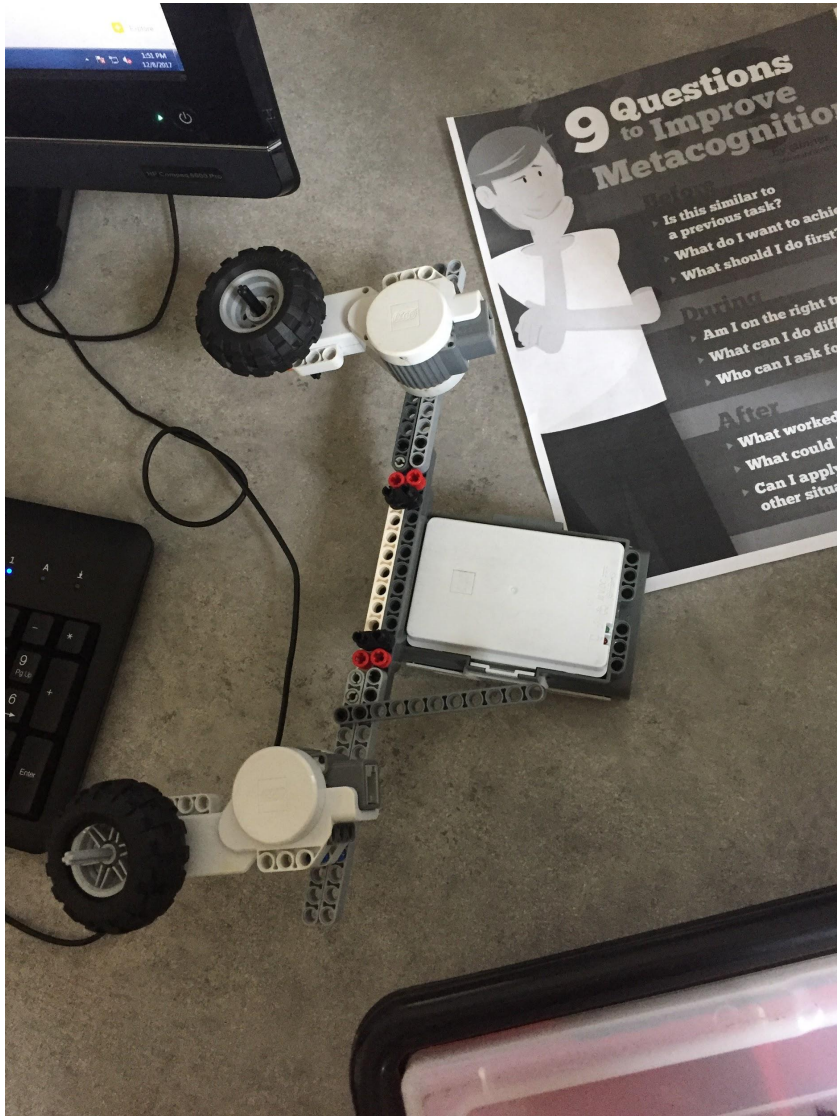
Collaboratively decide whether the solution needs more work and repeat previous phases as needed.

- Does your robot work?
- Did it perform as expected?
- What changes are necessary for the robot and the program?
- Does it meet the original design constraints?
- Is it safe?
- Students present their solution to the other teams and celebrate the work of the problem solvers

- our robot does work
- it simply did not perform as expected
- -completely reassemble the robot
- does not meet design restraints
- it is safe

# 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 :



## 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.

-skills that i will need is programming and building,  
thats all we need for the project

# 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.

dear future student,

To do good in robotics you don't have to be good at it you just have to try. You just try and you will succeed. All you have to do is show everyone in the class that you're trying and you will surely succeed in this class. And if you apply that effort in real life you'll succeed in that too.

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

**What metacognitive strategies are you using?**

**My thinking has positively changed because I now understand that you have to work for what you want and you need to try to get a good good grade in this class and that's what I'm trying to accomplish.**

## 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