Somerset Berkley Regional High School

Robotics Engineering with LabView

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

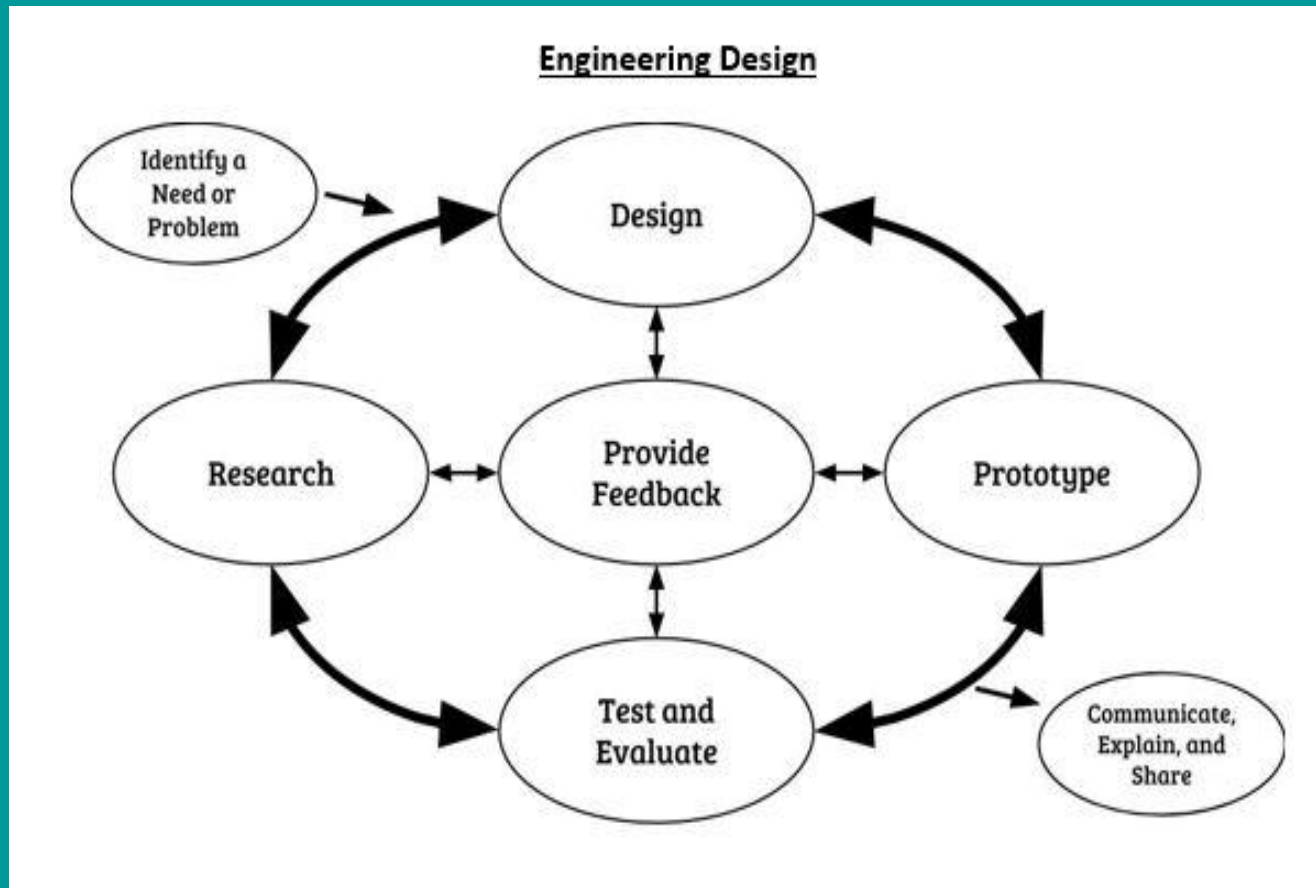**Planning ; What should step one be? What do I know about the problem?**

<u>Goal setting</u> Set realistic goals. How much time do I have?

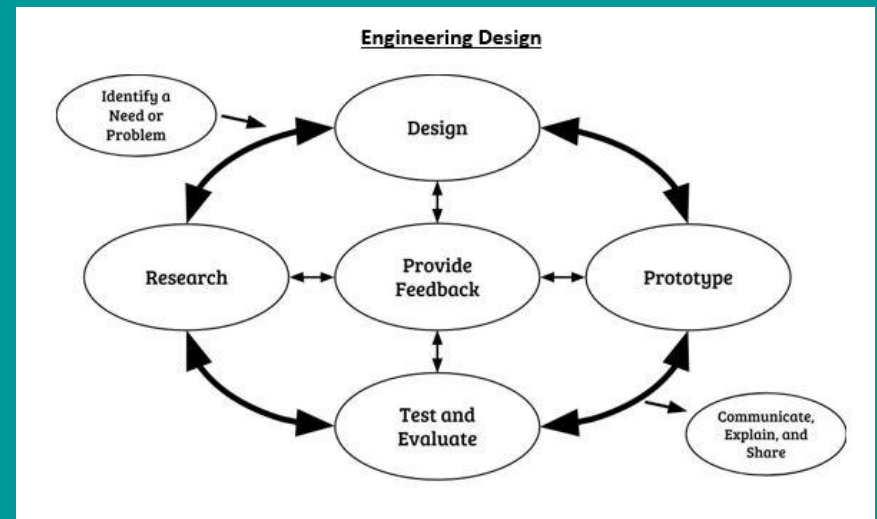**<u>Monitoring progress</u> Am I on the right track?**

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

Engineering Design Process

Standard 1.1

2016 Revised Massachusetts State Framework

Engineering Design

Identify a Need or Problem → Design

Design ↕ Provide Feedback

Research ↔ Provide Feedback ↔ Prototype

Research → Test and Evaluate

Provide Feedback ↕ Test and Evaluate

Prototype ↔ Test and Evaluate

Prototype → Communicate, Explain, and Share

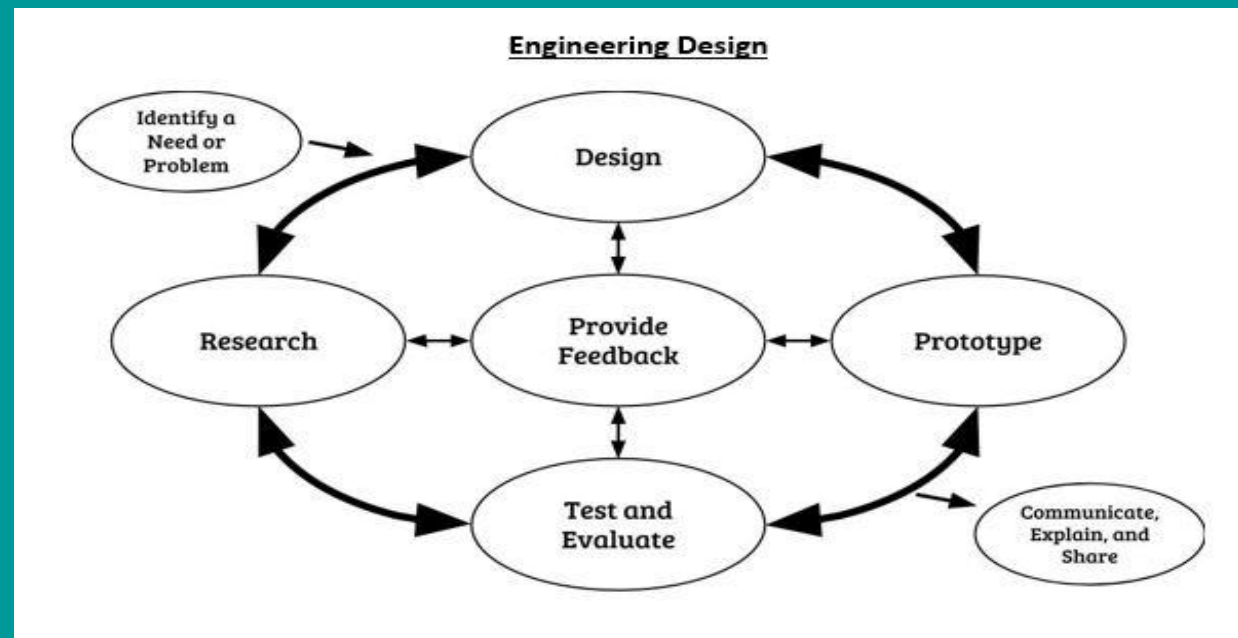Identify the need or problem

Engineering Design

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 or think you will need to solve this problem.

Ma.Science and Engineering Framework 2016

Research the problem

Engineering Design

Research. Research is done to learn more about the
 identified need or problem and potential solution strategies.
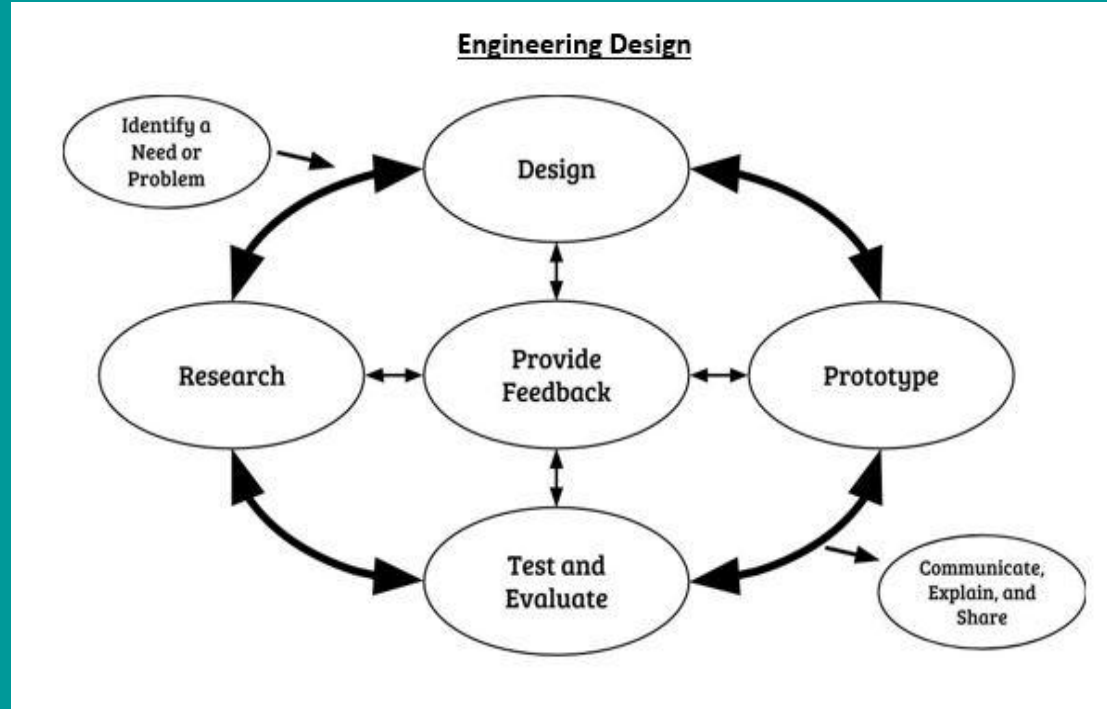Decide what information is needed.
What should step one be?
Use appropriate tools and strategies to access the information
Analyze the information gathered and its sources.
If there is more than one good answer to the problem,

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

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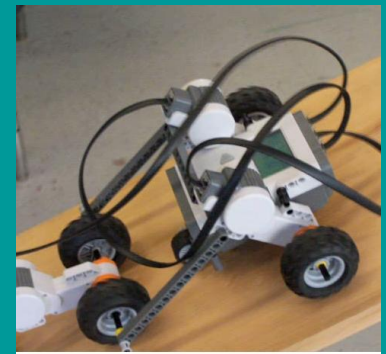
Evidence :Clarify the roles of each team member, taking advantage of individual strengths.
 List the role of each member on the team
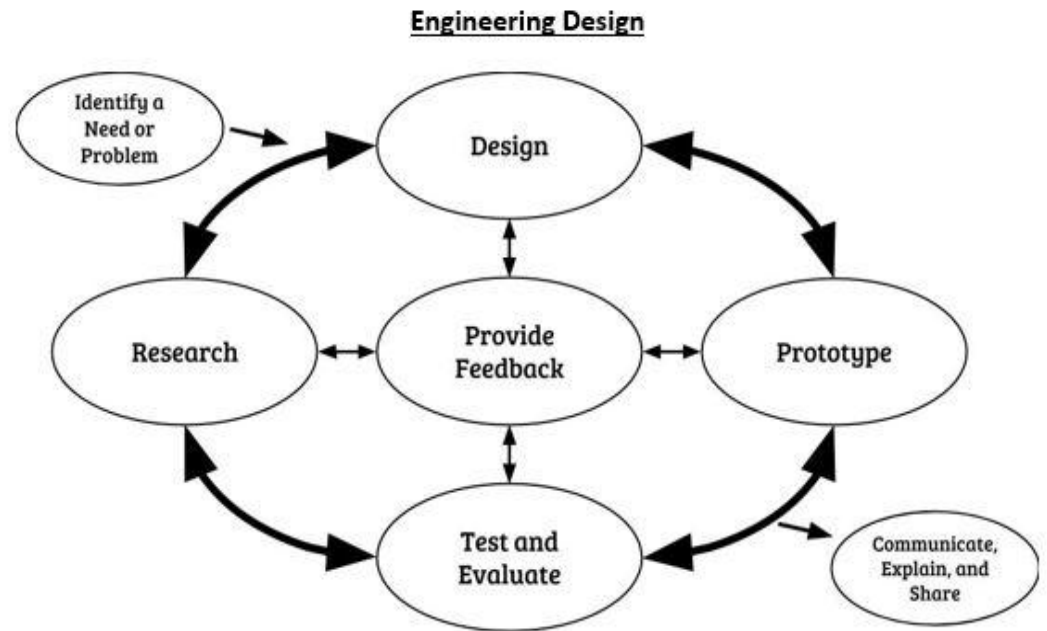
Prototype

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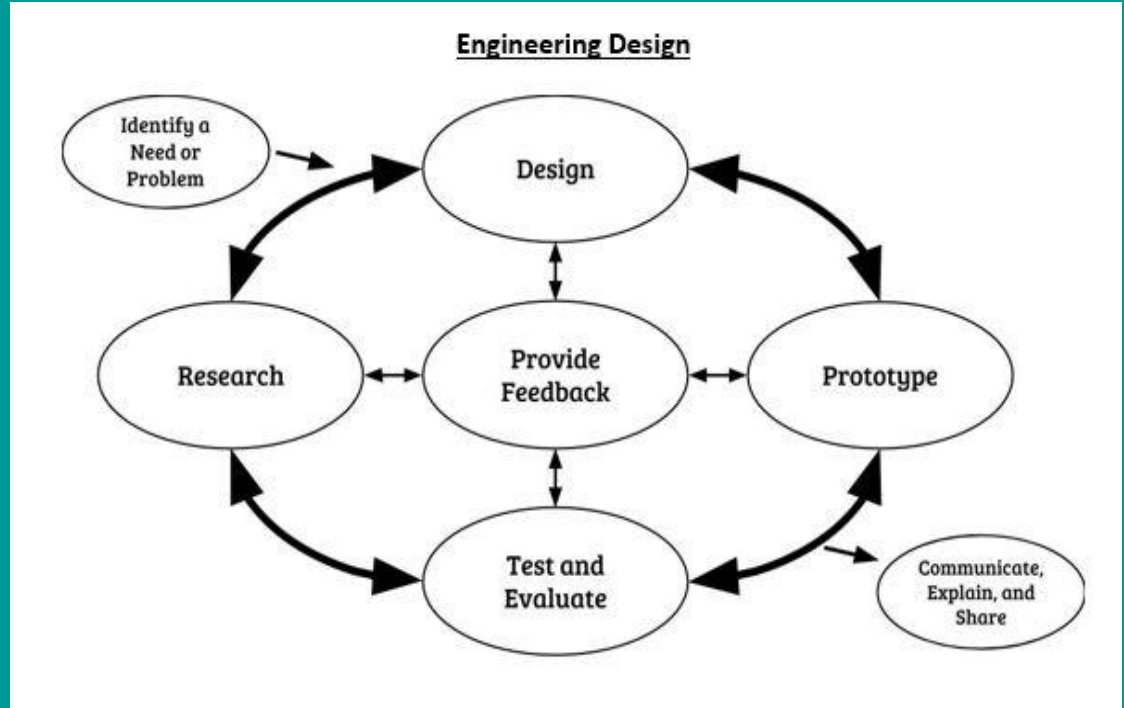
A prototype is constructed based on the design model(s) and used to test the proposed solution. A prototype can be a physical, computer, mathematical, or conceptual instantiation of the model that can be manipulated and tested.

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

Test and evaluate

Engineering Design

Identify a Need or Problem → Design

Research ↔ Provide Feedback ↔ Prototype

Test and Evaluate

Communicate, Explain, and Share

The feasibility and efficiency of the prototype must be tested and evaluated relative to the problem criteria and constraints.
<u>Collaboratively decide whether the solution needs more work and repeat previous phases as needed</u>.

- 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
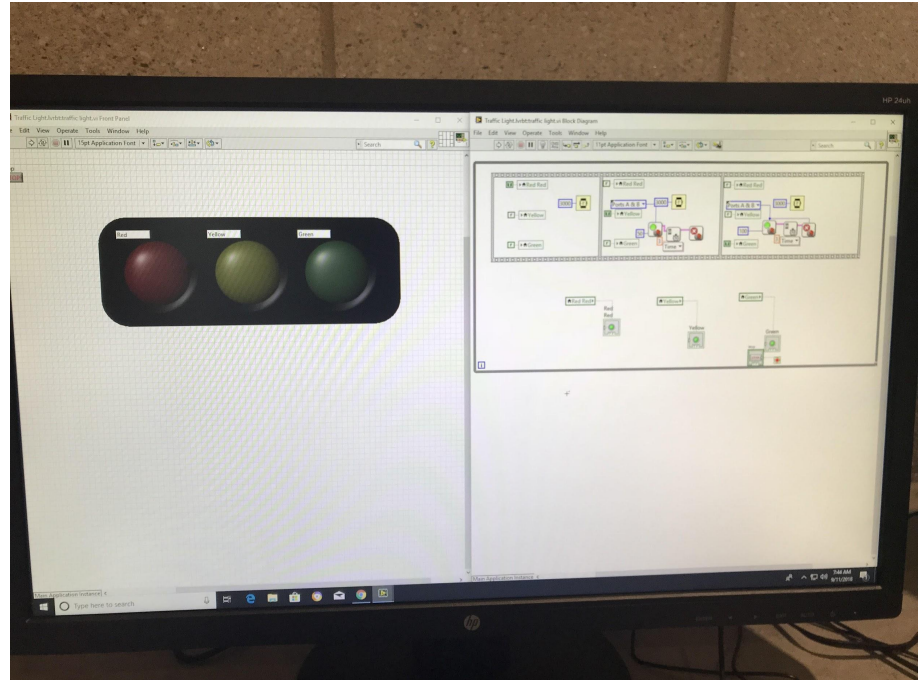
Evidence

modified prototype picture and computer program
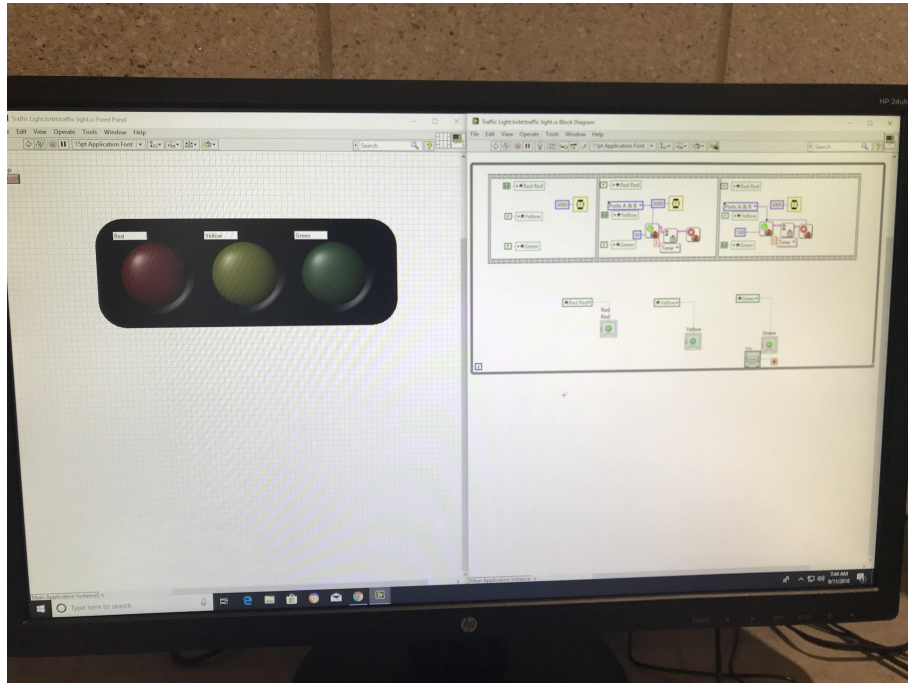
Evidence

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.

Faculty Focus.com

Ma.Science and Engineering Framework 2016

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 you eventually became better at the task at hand and succeeded. Briefly describe this experience in a letter to a future robotics student.

Khan Academy

What metacognitive strategies are you using?

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

References   Faculty Focus .Com
              Khan Academy
              Massachusetts 2016 frameworks