

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?

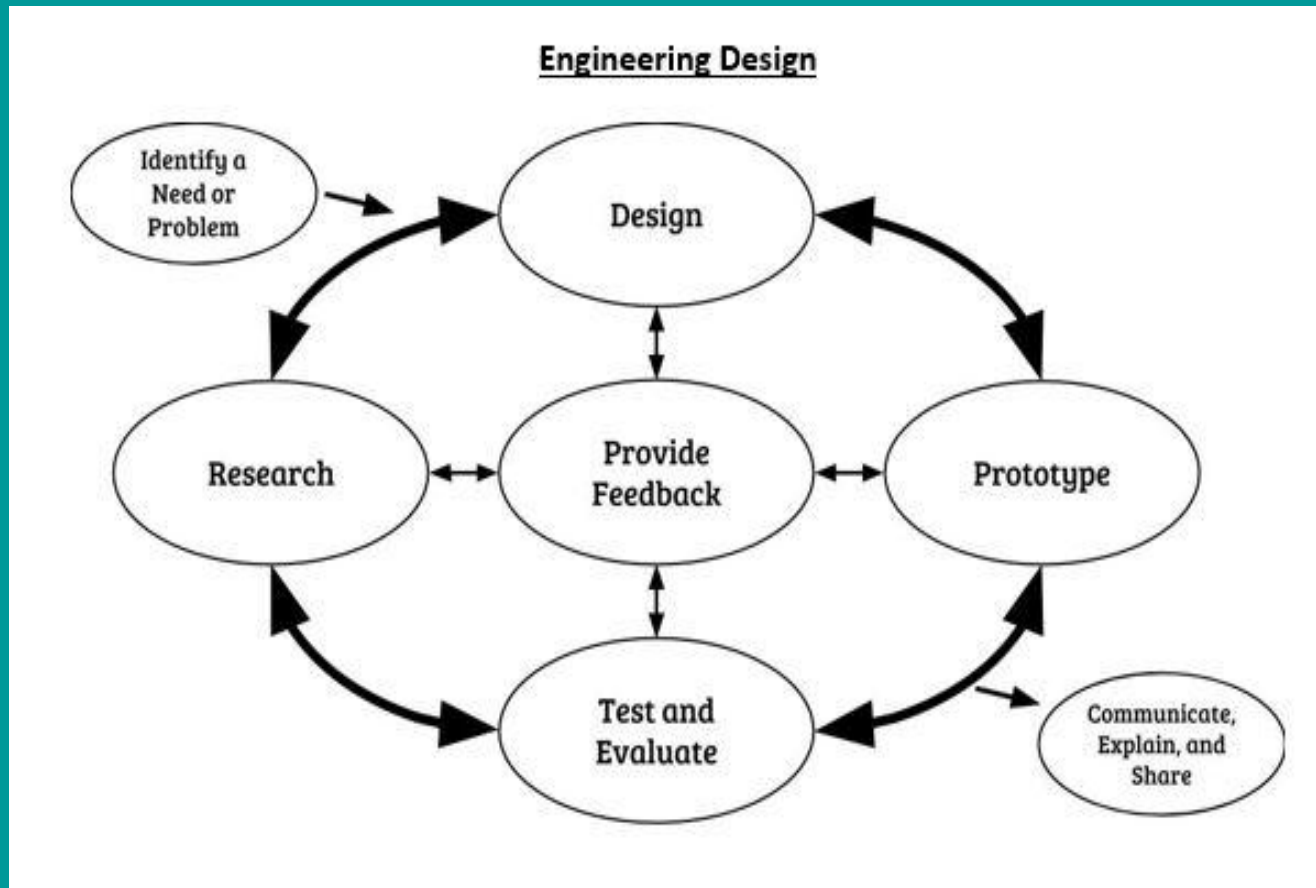
Goal setting Set realistic goals. How much time do I have?

Monitoring progress Am I on the right track?

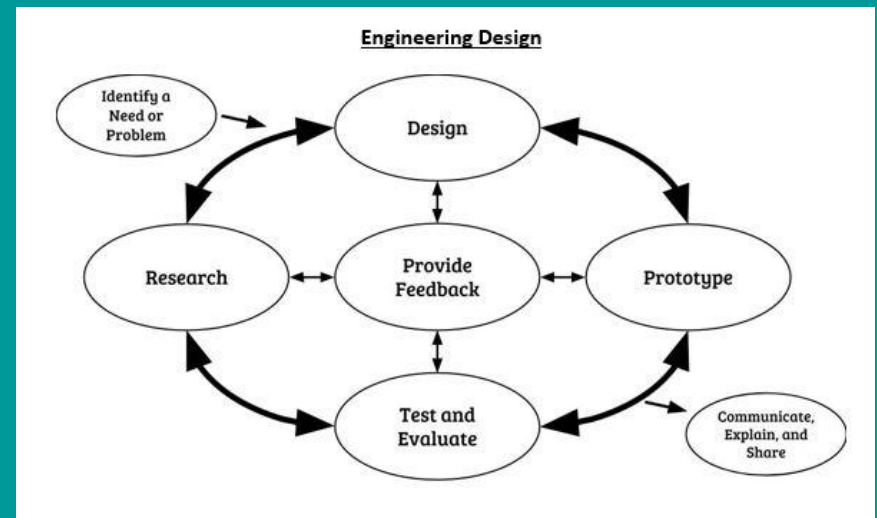
**Adjusting What did I learn. Did I get the results I was expecting?
If I could do this over again I would.....**

Standard 1.1 Engineering Design Process

2016 Revised Massachusetts State Framework



Identify the need or problem



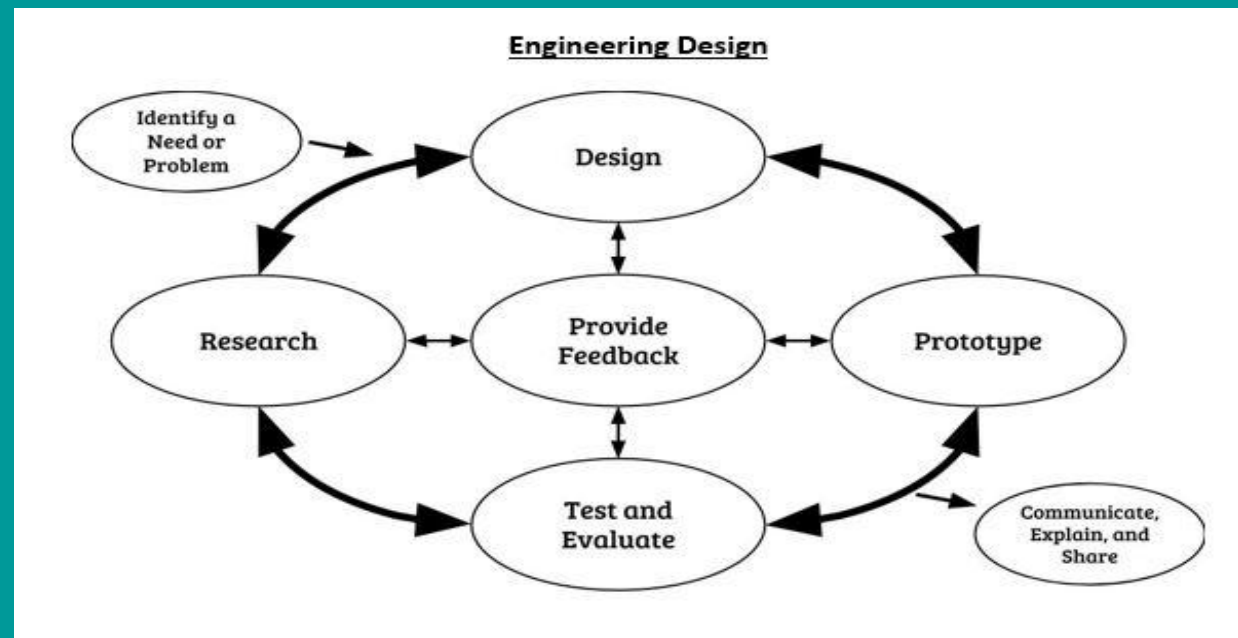
Identify a need or a problem. To begin engineering design, a need or problem must be identified that an attempt can be made to solve, improve and/or fix. . This typically includes articulation of criteria and constraints that will define a successful solution.

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 or think you will need to solve this problem.

The most challenging part of this project is connecting 4 motors to a robot and learning how to use gears to make the robot go faster. Also, using tinkercad was challenging.

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

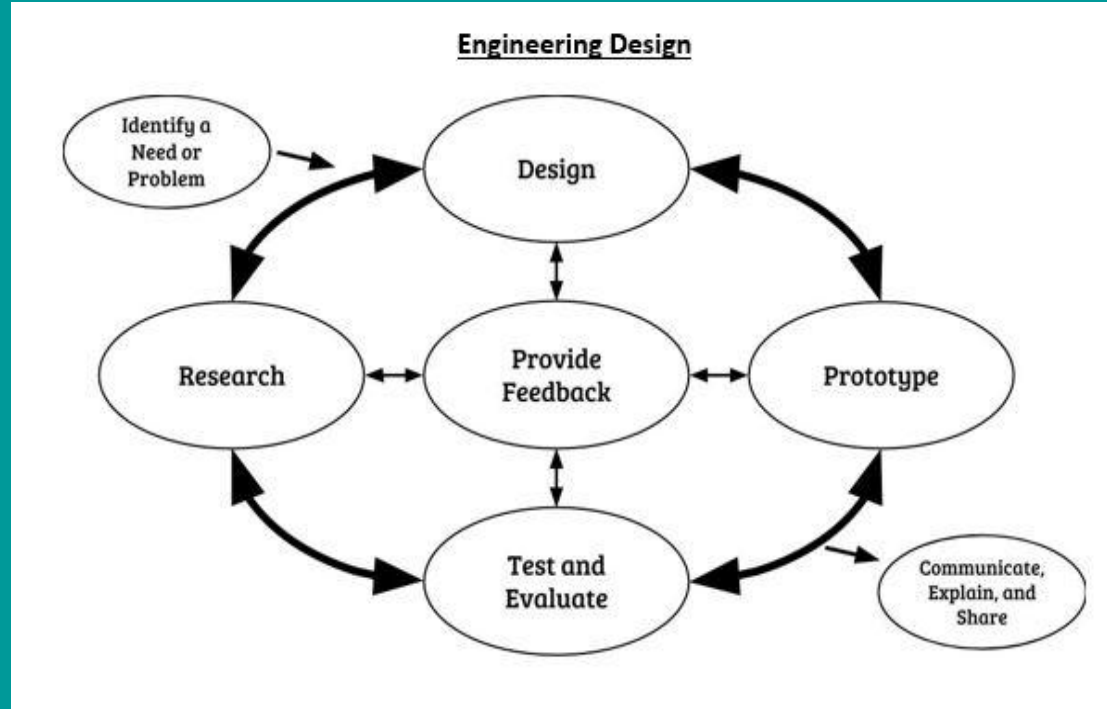
Analyze the information gathered and its sources.

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***

I looked up how to use gears in robots to make them go faster. Also using the tinkercad website helped as well.

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.

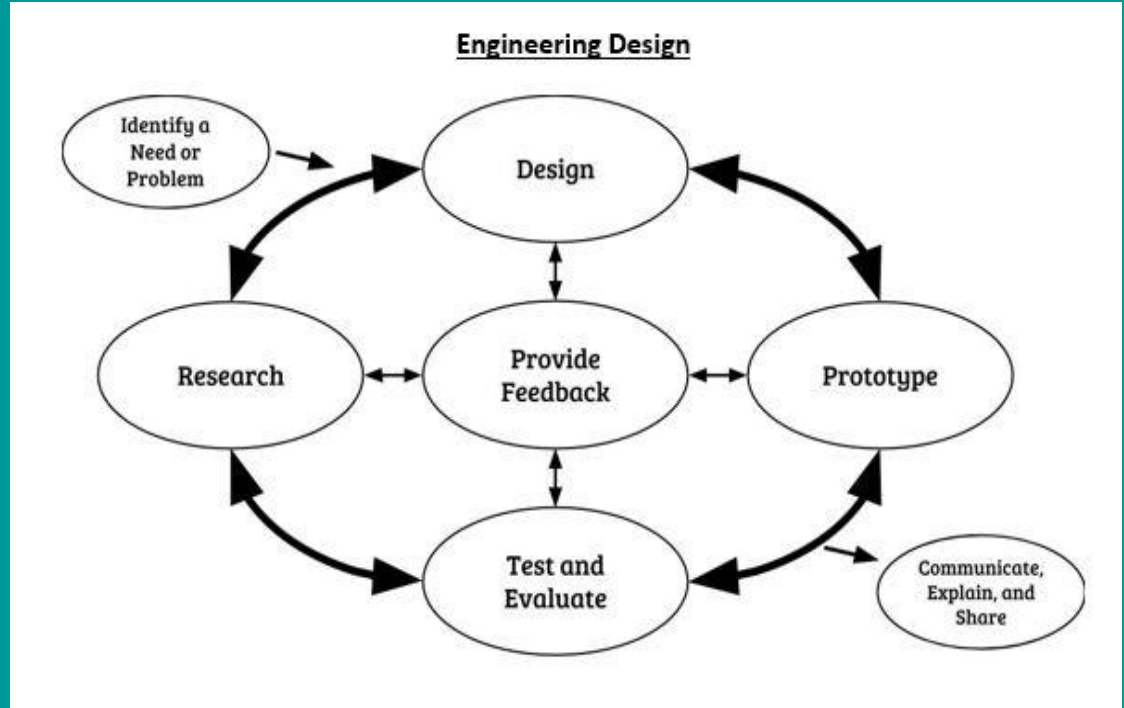
Evidence: Clarify the roles of each team member, taking advantage of individual strengths.
List the role of each member on the team

Nick Medeiros- co-builder

Devyn- co-builder

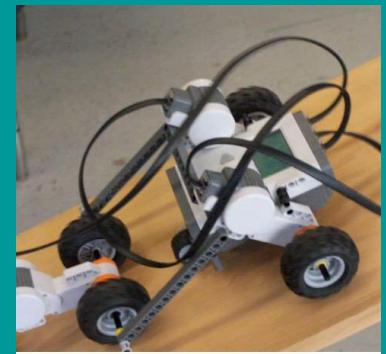
Tom- Programmer/ builder

Prototype

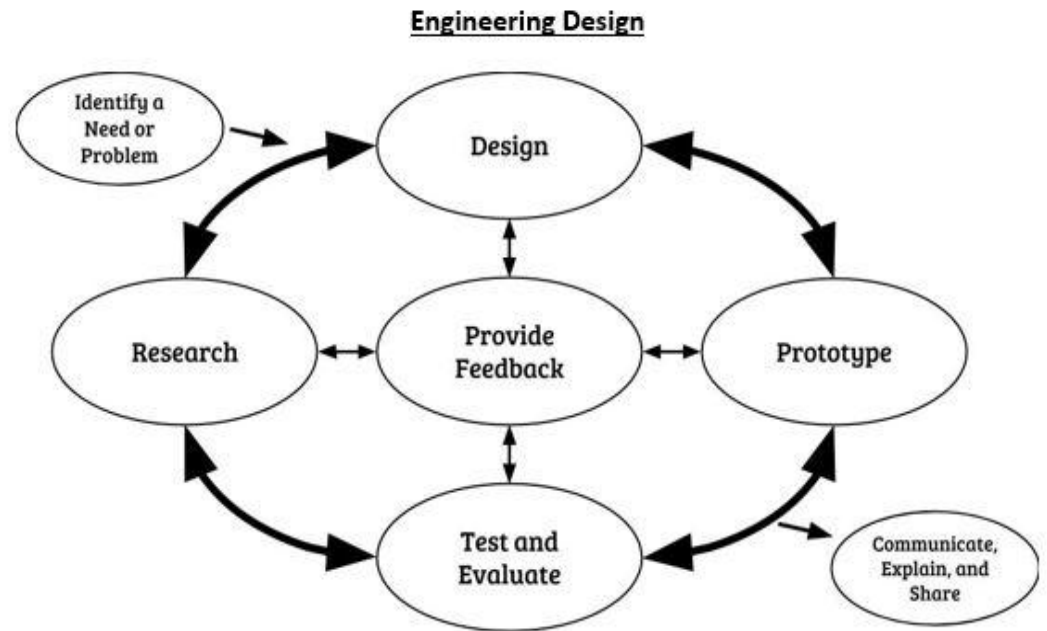


A prototype is constructed based on the design model(s) and used to test the proposed solution. A prototype can be a physical, computer, mathematical, or conceptual instantiation of the model that can be manipulated and tested.

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



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 did work in the sense that it moved and was able to exert a force on the rope. However, it lost against the opposing robot most likely because it did not have all 4 motors on it.

Evidence

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.

When I am older I aspire to be an aeronautical engineer. Problem solving and innovation skills are essential to this job along with computer programming skills. This class goes hand-in-hand with my future because it exposes me to these different skills and allows me to improve upon them.

Letter to a future student

Dear future student, I strongly encourage you to take this class seriously because it will provide you with skills that will be beneficial in your life. Also do not be discouraged when you fail in this class, it is all part of the process.

What metacognitive strategies are you using?

The most prominent metacognitive skills used in robotics are your ability to innovate and problem solve. Critical thinking is important in robotics.

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