

You are currently working to create a physical prototype of something that was previously only a proposed idea for a plan. It might be exciting to create a functional prototype directly from the idea. Then the prototype would be ready immediately for your proposal presentation but, in practice, this method does not work. What if your idea(s) was too complex? What if the design does not work? What if the proposed solution does not solve the intended problem when tried out? ***This is why a Proof of Concept prototype is important.***

What is a Proof of Concept prototype?

A *Proof of Concept* prototype is a prototype that is created in order to demonstrate the feasibility of an idea - whether it can be created and if it works to solve the problem.

Why use a Proof of Concept as your first prototype?

Using a *Proof of Concept* as your first prototype enables you to demonstrate that your design can be successfully carried out. You can also use this prototype to test out components and code to ensure that the prototype can function as intended.

NOTE: It is very important to have this first prototype created and tested before continuing on to create a more complex model. This will save time and effort in the engineering process.

Creating a Proof of Concept prototype

1. Concentrate on having all of the pieces working (sensors and motors), rather than on the overall construction of the final prototype.
2. Decide which sensors will be needed, and how they will work together.
3. Create the program using the pseudocode that you created before the previous checkpoint.
4. Test it.
5. Use the test results to correct issues in the code and/or hardware.
6. Repeat Steps 4 and 5 until the prototype is working appropriately.

Example:

Proof of Concept Prototype

Problem:

The weather can be difficult to predict.

Solution:

Use robotic equipment to collect data that can be used to predict the weather.

Idea:

We could use the color sensor to determine whether the color of the clouds in the sky. Using that information, we could predict the weather.

Supporting materials:

We create a schedule, sketches of what our design would look like, and a flowchart of our code that will use the color readings to attempt to predict the weather.

First Prototype

We now create a Proof of Concept Prototype to determine if the idea is possible.

As a rough design, we will attach the color sensor to the robot brain. We will now use our pseudocode and flowchart to attempt to read the color of the clouds in the sky.

It turns out, the sensor is unable to determine the color of the clouds. After some research into the sensors, we have discovered that the range of the color sensor is around 6 inches. Our robot is not within six inches of the clouds. So, we will not be able to use it for this purpose.

The prototype helped us to determine that our idea of sensing the clouds' color is not possible with the sensors available to us. In this scenario, we would return to the Ideation phase and think up another idea that could help to solve the problem.