

WATER QUALITY TESTER

Activity Overview

The water we drink contains a lot of acids in it. If the level of acids in water exceeds a certain level it is harmful. Acidic water causes:

- Skin and eye irritation.
- Stomach aches and gastric problems.

In this project we will be detecting the water quality using Genuino 101 which will help the users to find if the water is drinkable or not.

SUBJECTS



Science



Computing

TIME REQUIRED



2 Hours

AGE LEVEL



11 - 18 Years



What Shall We Learn?

- How to detect the level of acids and alkaline in water.
- How to display output values on an LCD screen
- How to use a Genuino board to convert voltage values into pH values.

Activity Objective

The problem at hand is to find out how safe is drinking water. We need to come up with ideas to detect water quality and ensure people drink clean and pure water.



Components Needed

To test the quality of water we need the following components.

Genuino 101

The brain of our device. It will receive data from the ph sensor and convert it into Ph values and blink the respective led based on PH value.

pH Sensor

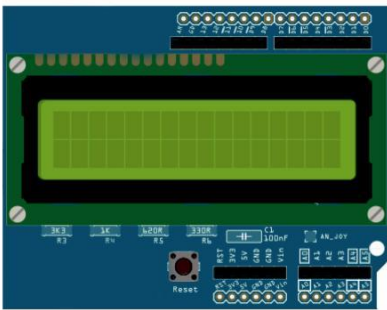
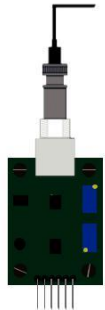
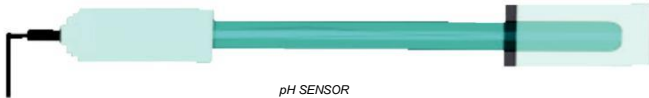
It detects the acidic density of the water and provides the values based on it to the Arduino 101.

16 x 2 LED Shield

The screen will show you pH value of the water.

Power Supply

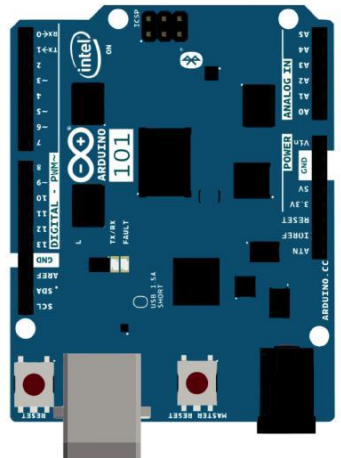
It provides energy to our controllers and sensors.



LED SHIELD



POWER SUPPLY

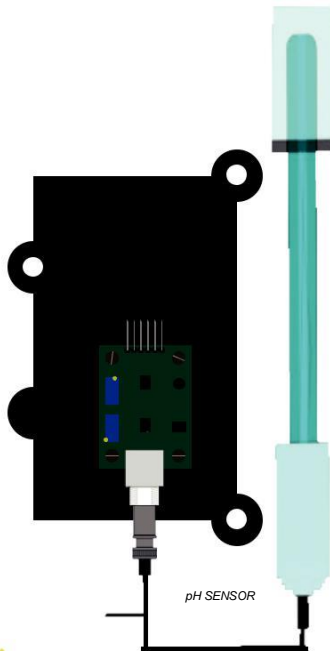


Understanding Sensors

The Quality of water is measured in pH which stands for potential of hydrogen. If the pH value of water is less than 7 it means the water is acidic and harmful if consumed.

A pH sensor is dipped in the water, it detects the quality of water in the form of voltage. Which then sent to the Genuino 101 which converts the voltage value in the form of pH value.

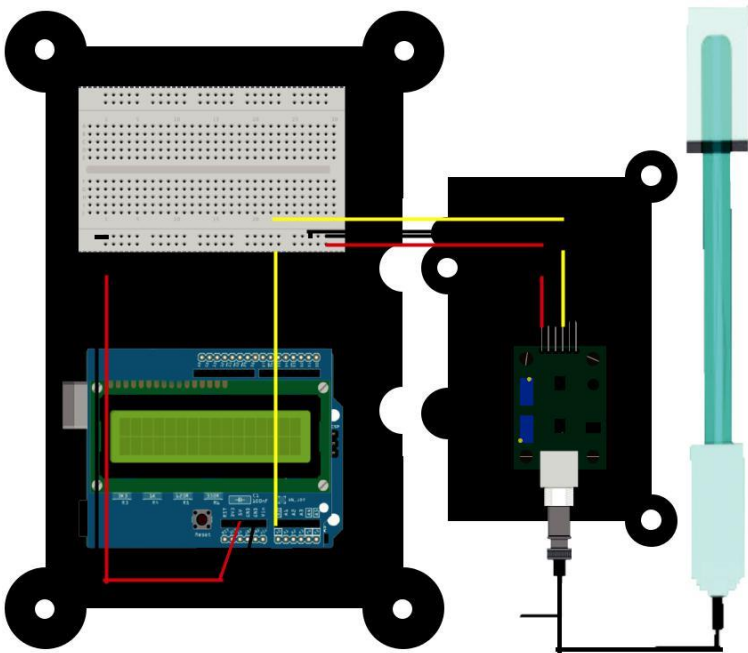
On the basis of pH value we can judge the quality of water.



Connecting Your Sensors

We have all our components ready to be connected. Let us start:

1. Connect your LCD shield to your Genuino 101, there are connectors where you can gently plug in your LCD shield.
2. Then gently plug the pH sensor on the LCD shield there are female connectors where you need to plug the male wires.



TOP VIEW

After connecting the pH sensor with the LCD shield we shall provide power using our laptop. Once the power is connected we shall begin with our programming.

Programming Your Sensors

Download and open the code from bit.ly/WaterQualityTesting and now you will have to upload the code on your Genuino 101 Click the upload button and once your code has been uploaded you can see the pH value of water on your LCD screen.

Yaay! You have successfully programmed your device.



*Upload Button
(Top Left)*

Output

Let us try testing our device to see if it gives accurate results. Try dipping the sensor in dirty water and then in clean water. When the water is dirty, the pH value should be less than 7 and if the water is clean the pH value shall be more than 7. If this results are shown on your board it means you have created an perfect water quality sensor.



Model Cretation

Before we begin with the model creation make sure you have:

- 6 Spacers
- 12 Screws
- 1 Transparent acrylic board.

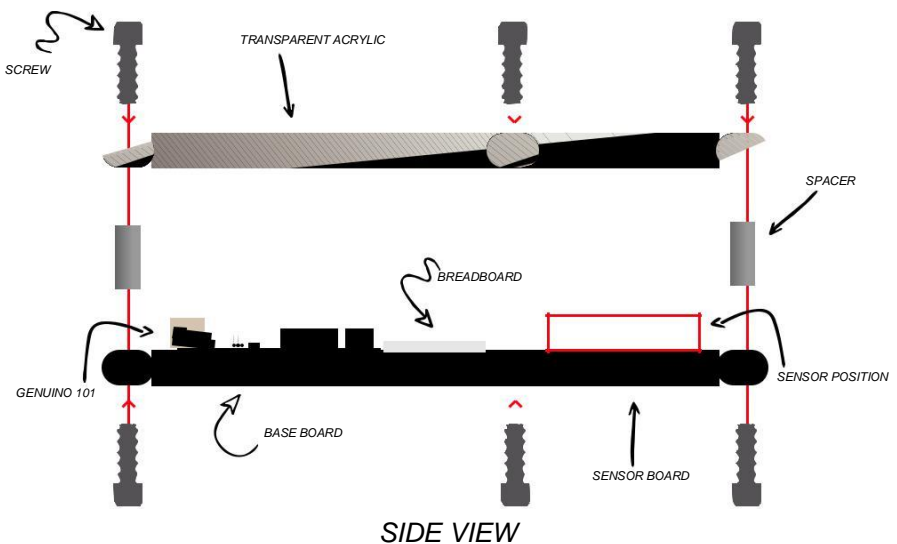
We will now arrange all the components in a case and make it look cool and easy to use.

We will begin by connecting the pH sensor module to the base module. The breadboard and Arduino 101 are on the base module while your pH sensors is on pH sensor module.

Now insert the spacers on the cutouts which are given in the activity kit and tighten them using the screws provided to you.

We have our modules attached and spacers set up, now gently place the transparent acrylic board on the spacers and tighten it using the screw.

Once everything is ready, ensure all your screws are tightened and your modules are connected properly.



Impact Analysis

Every year more than 15 million children under the age of five die because of diseases caused by drinking water. Now imagine if we could test the water which is consumed by the children we could save so many lives.

Future Scope

We can make our water Quality tester even better by doing some additional steps like:

● We can try printing different messages on the LCD screen based on the pH value to make it understandable to everyone.

Or connect pH sensors in a water tap and ensure water only flows if it is drinkable. Trying thinking of other possibilities too.

