

# My Backyard Stream

## Conductivity and Calibration

### Key Terms: Conductivity



#### Ion

an atom or molecule with a negative charge



#### Atom

the basic unit of a chemical element



#### Molecule

a group of two or more atoms held together by attractive forces known as chemical bonds

### Key Terms: Calibration:



#### Calibration

The process of configuring an instrument to provide a result within an acceptable range.



**Safety: Before you get started make sure you are aware of your surroundings and traffic.**

**Always be with an adult while exploring, be cautious of sharp objects that may be in the creek or on the streambank, and never enter a stream with high or fast-moving water.**

### What is conductivity?

Conductivity is a measure of water's ability to pass an electric current, which means it is dependent on the number of ions and the temperature. The unit for measuring conductivity is microsiemens per centimeter. It is a valuable tool to have because it can act as a baseline or starting point for monitoring. Changes in conductivity can indicate that pollution has entered the water.



### Did you know?

Conductivity can change quickly and drastically after a storm event because substances like chloride, nitrate, calcium, iron and others can be brought into the body of water by rain. As temperature increases, so does conductivity.

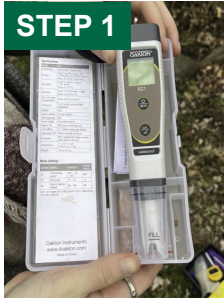


### Why do we calibrate the different meters for testing water chemistry?

Certain chemistry measures like conductivity, pH, dissolved oxygen, and others require us to calibrate our meters before testing the water. Why do we do that? Well, when we calibrate we use something called a standard solution, sometimes also called a 'known solution'. We call it this because we know the value of the solution and what the meter should read.

For instance, if we are testing conductivity we use a solution that has a measure of 1413 microsiemens. Microsiemens ( $\mu\text{S}/\text{cm}$ ) is a unit of measurement that tells us the electrical conductance of the water. Sometimes, meters make mistakes, and we must correct them. If we use a known solution of 1413 microsiemens and our meter says something different, we must tell it that it is wrong, and it should be 1413. That way when we go to measure the conductivity in the water, the meter has something to base the measurement off.

## Calibrate your meter by following the directions below



Remove the clear cap from the conductivity sensor and rinse the now exposed probe with distilled water. Always rinse your meter 3 times before taking a new conductivity measurement. Dry it with a clean tissue.



Turn on the testing probe by short pressing the power button ( / MEAS). A short press is < 2 seconds.



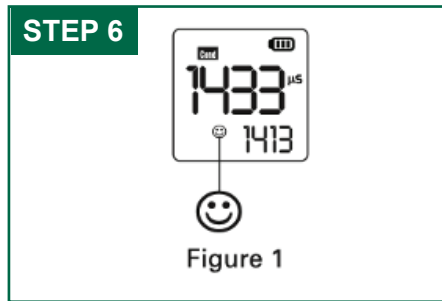
Enter calibration mode by long pressing the CAL button (a long press is > 2 seconds).



Open one 1413 µS/cm calibration solution packet, completely submerge the probe



Stir the solution gently with the probe, then leave it to stand.



Wait for the measurement stability icon (a smiley face) to appear on the bottom of the meter's display, then short press the CAL button to complete the calibration. View the location and size of the stability icon in Figure 1.



After you have finished calibrating the probe and pressed the CAL button, the display should return to measurement mode and an "M" will appear on bottom left side of the display.



Finish the calibration process by rinsing the probe with distilled water and drying it with a clean tissue. The probe is now calibrated and ready to be used for water testing.

### Other Tips

- You should calibrate your meter right before you start using it. You don't have to calibrate more than once a day but it is a good idea to recalibrate if you notice that it is jumping around a lot or is inconsistent with other measurements you have taken just to make sure it is reading correctly!
- If you accidentally press the CAL button and enter calibration mode, to exit, short press the power button.
- A long press is greater than 2 seconds and a short press is shorter than 2 seconds.

### For more Information:

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