

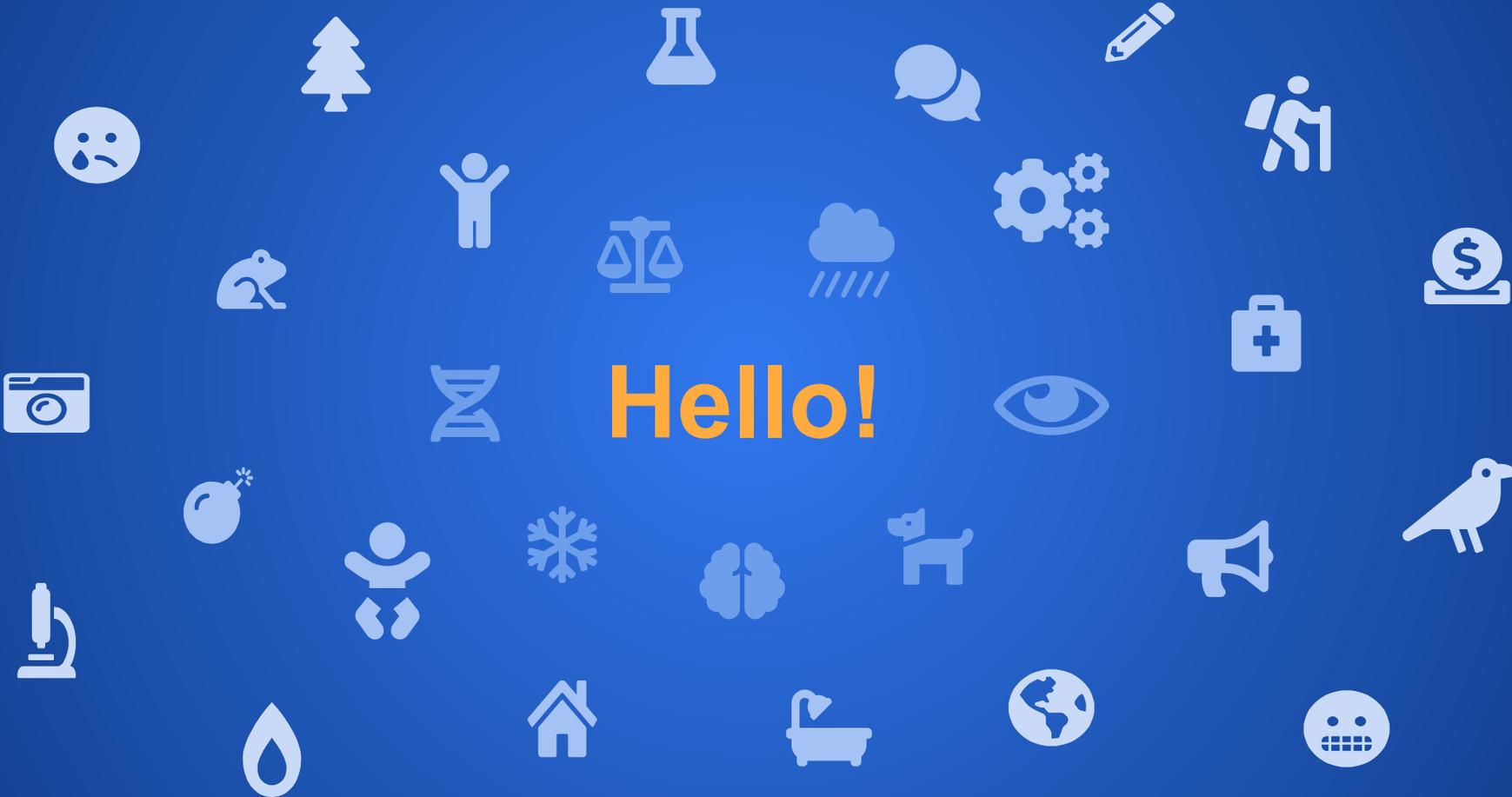
Water Quality Testing



"Miigwetch Grandmother Moon"
Shared by Andrea Redsky



Hello!



Traditional Ecological Knowledge

Equally if not more important than all of the tools in this presentation is the social and ecological knowledge of environmental experts within your community.



Why Test The Water?



Water is Life...

Every living thing on Earth needs water to survive.

Humans need clean, fresh water.



What is Water Testing?



There are many tests we can run with a water sample to help us understand that water's health.

These are a few that we will run today:

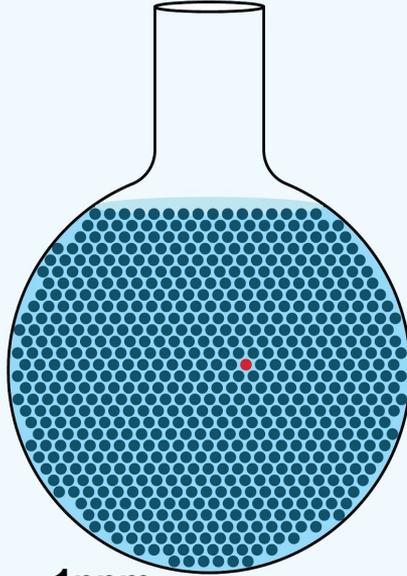
- pH levels
- Alkalinity
- Hardness
- Conductivity
- Total Dissolved Solids (TDS).



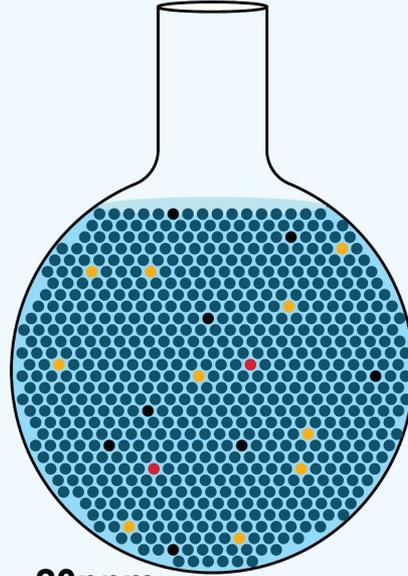


Parts Per Million

PARTS PER MILLION



-1ppm



-20ppm

-3 different dissolved solids

So let's think about this...



Parts Per Million

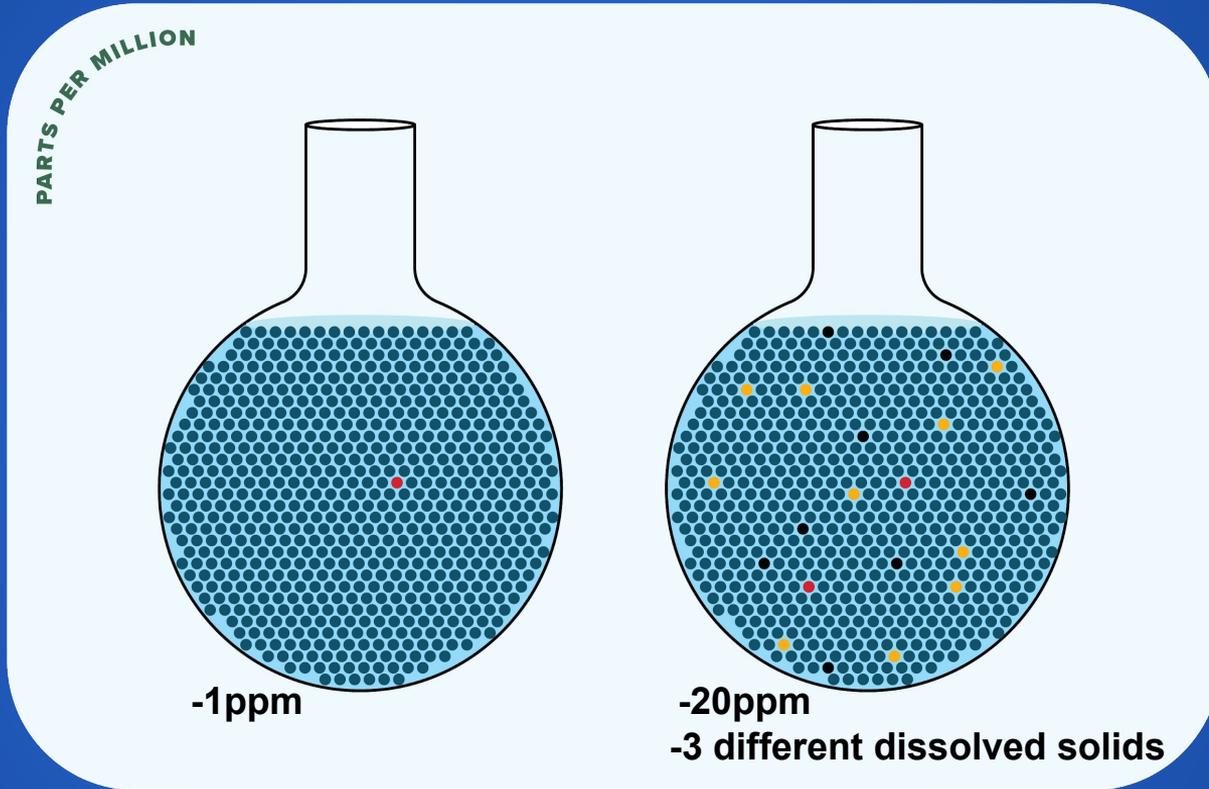
So let's think about this...

1 ml of water contains = 3.346×10^{22} water molecules.

So, that's 3,346,000,000,000,000,000,000 molecules.

A glass of water contains about 250 ml on average.

So even if a substance has 50 ppm, that still millions of molecules of dissolved substances.



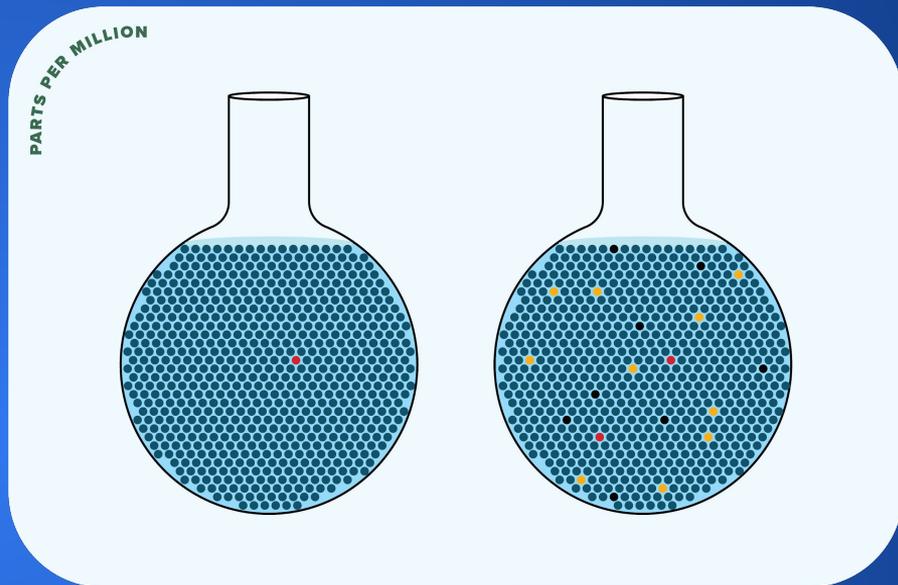
Total Dissolved Solids (TDS)



This is a way to look at non-living substances dissolved in water.

TDS level between 50-150 is considered as the most suitable and acceptable

A TDS of 1000ppm is generally considered unsafe to drink. Anything over 2000ppm can be hard to actually filter effectively.



The Usual Suspects

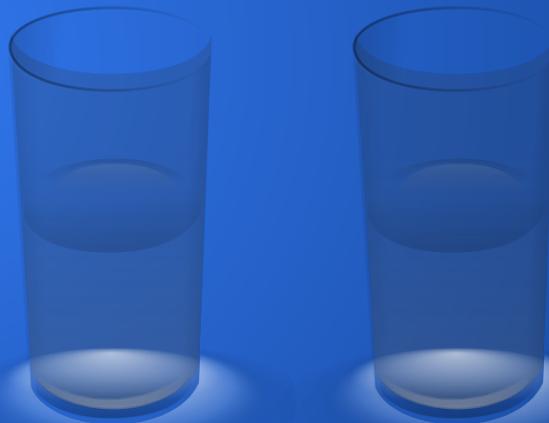
- | | |
|----------------|-------------|
| ● Bicarbonates | ● Magnesium |
| ● Calcium | ● Potassium |
| ● Chloride | ● Sodium |
| ● Iron | ● Sulfates |
| ● Lead | ● Zinc |



Total Dissolved Solids (TDS): The Test

Multiparameter Reader

- Make sure the device is on the right setting.
- Dip it into the water.
- Read the number!



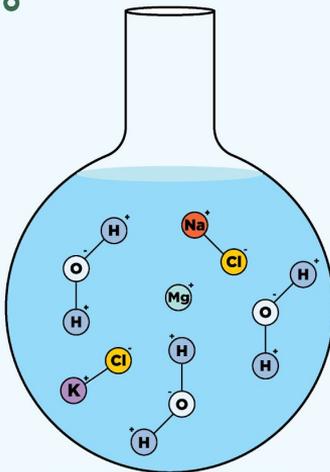
Conductivity

Conductivity is the ability of water to carry electricity.

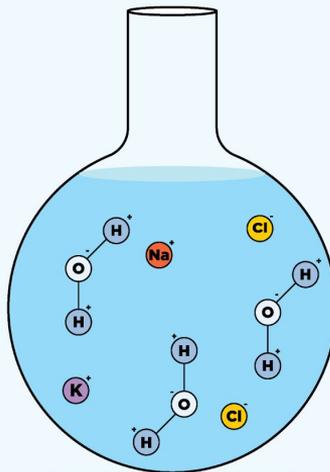


Conductivity

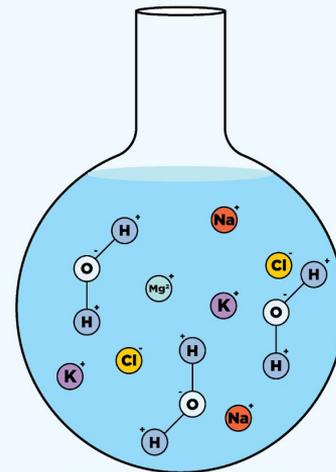
CONDUCTIVITY



**Salts dissolve and
release ions**

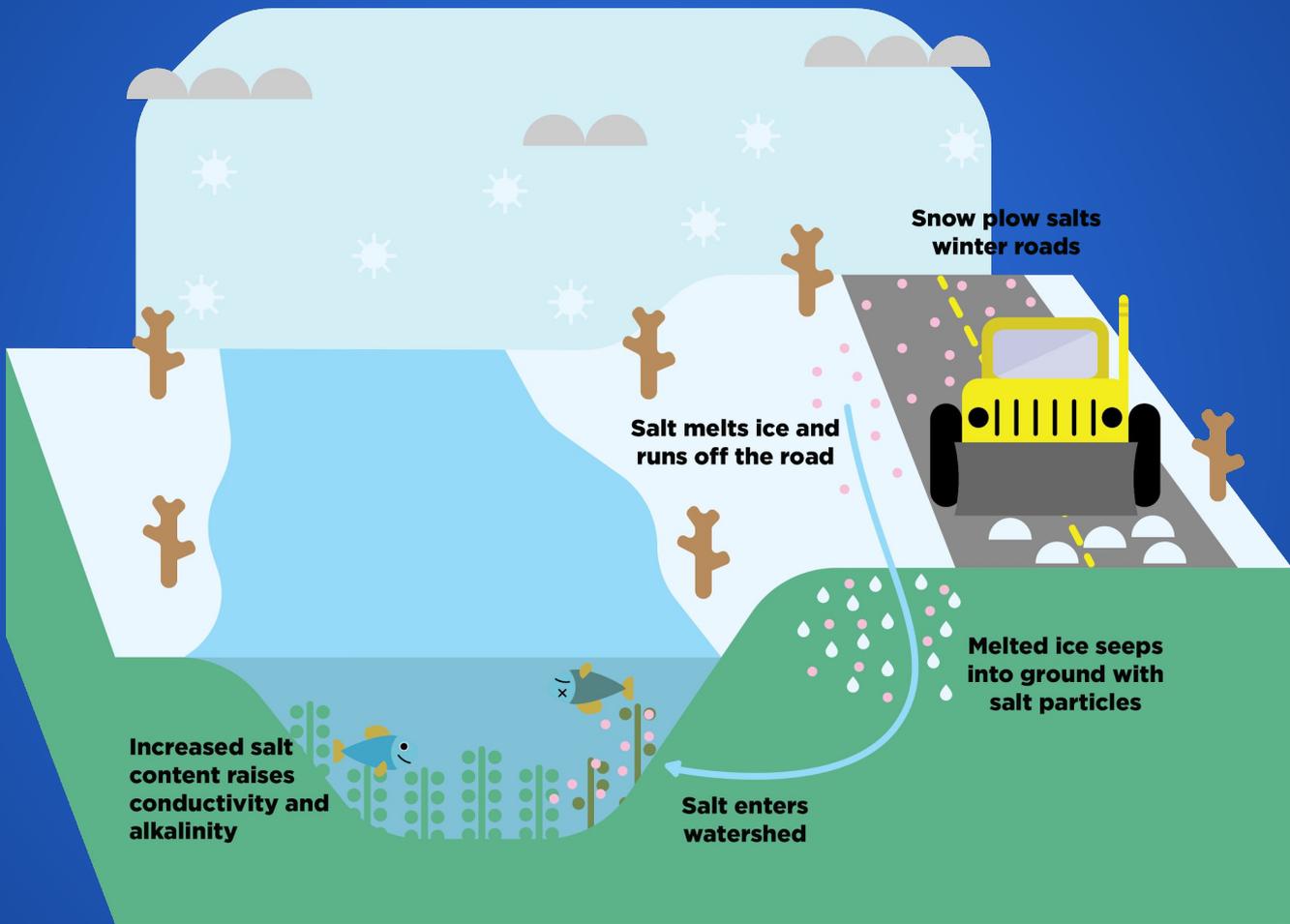


**Fewer ions means
lower conductivity**



**More ions means
higher conductivity**

Conductivity



An Indicator



Conductivity: The Test



- Use the Multiparameter Reader from when we measured TDS.
- Hold **Mode** to change to Conductivity.
- Units: MicroSiemens (μS)

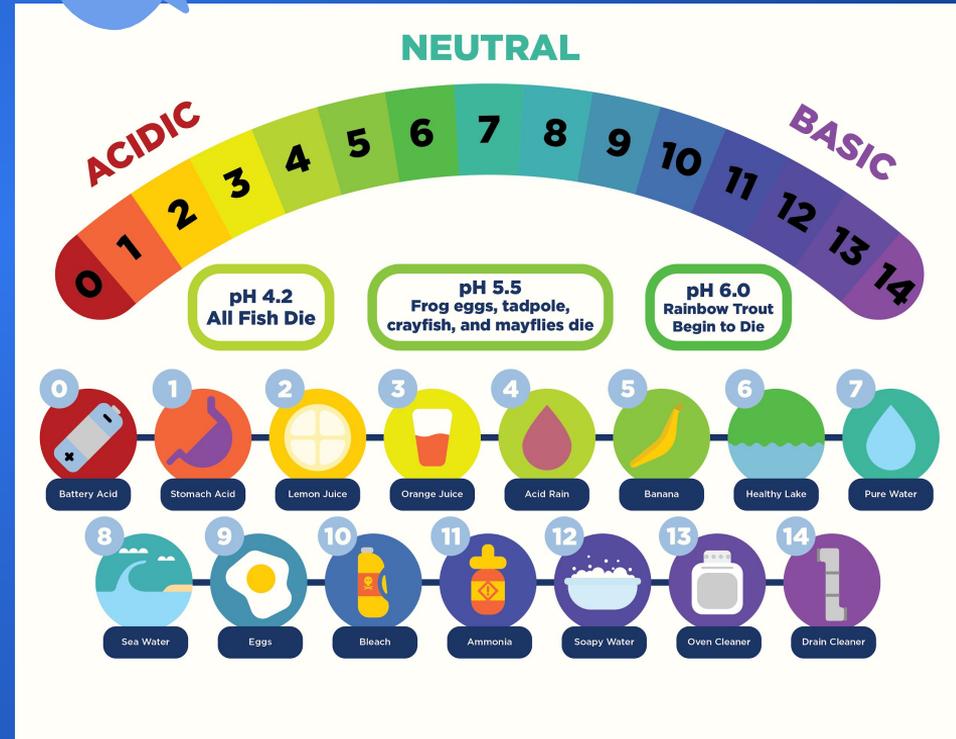
pH: potential of Hydrogen



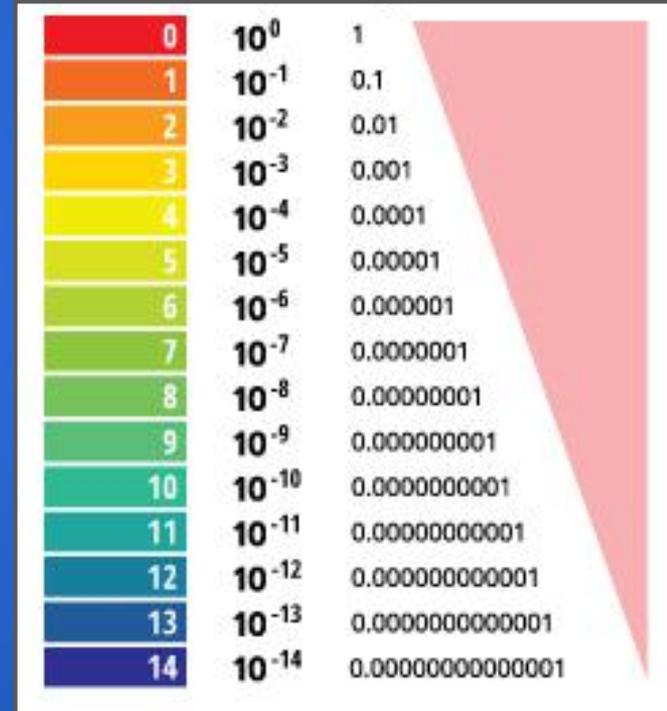
The pH level of a water sample is a measure of how much Hydrogen is present in it.

pH < 7 = acidic
 pH = 7 = neutral
 pH > 7 = basic

Each level of the pH Scale is exponentially decreased going up from zero.

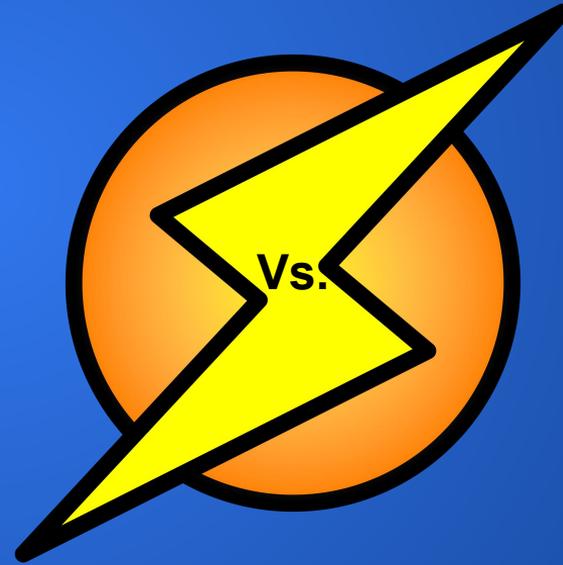


Exponential Decrease



Examples on the pH Scale

LEMON
JUICE



Milk



[Return to the Jam board](#)



pH Testing

pH test strips determine where the water sample falls on the pH scale.

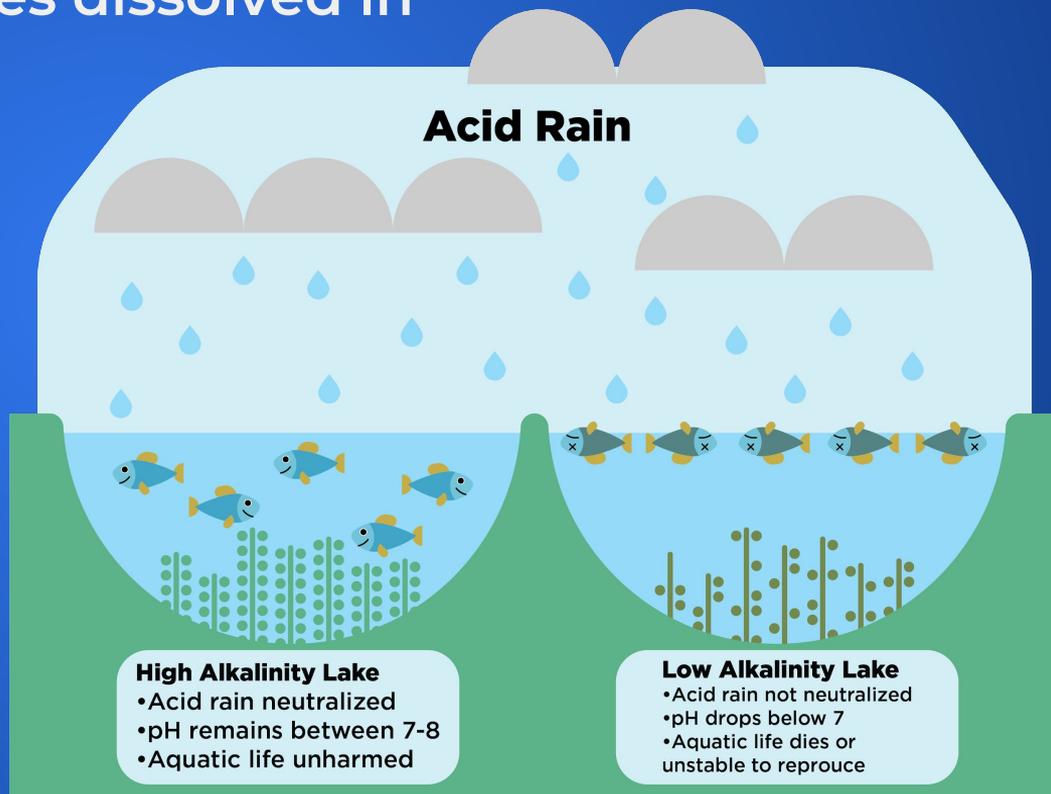
- Dip one strip into the water for 5 seconds.
- Compare your colour to the numbered chart on the back of the bottle.



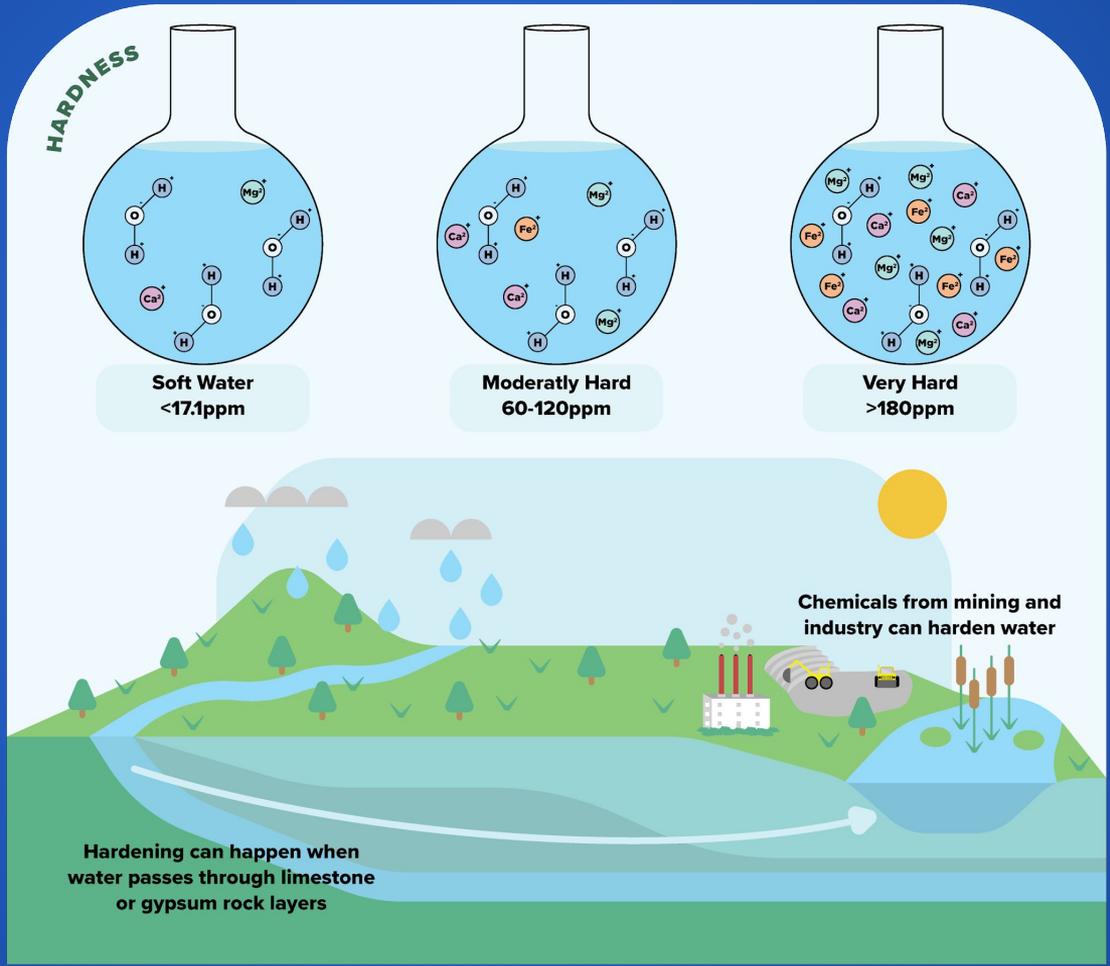
Alkalinity

Alkalinity depends on the amount of alkaline (basic) substances dissolved in the water.

Two examples of substances that boost alkalinity are calcium and magnesium, which are both found in limestone.



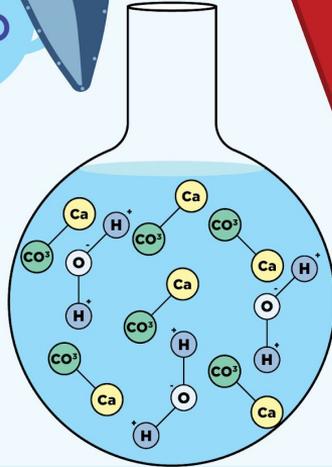
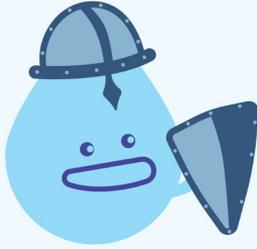
Hardness



Alkalinity



ALKALINITY

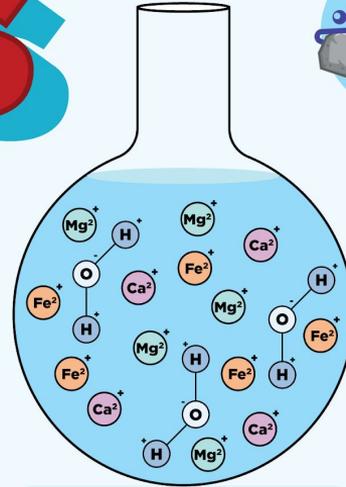


Alkalinity measures the amount of calcium carbonate (CaCO_3). Calcium Carbonate protects the water from changes in pH.

V S

Both are measured in Parts Per Million (ppm).

HARDNESS



Hardness measures the amount of dissolved minerals and ions.

Hardness



Alkalinity and Hardness: The Test

Multi-parameter Test Strips

- Work the same as the pH strip. Dip it into the water.
- Compare the new colour to the numbered chart.



Look at the Results Using the Jamboard

Traditional Ecological Knowledge



Without asking experts in your community about the ways to meaningfully observe, interact and learn from your lands, you are missing an incredibly valuable piece of the bigger picture.



Water is Life

“There is no life without water.”

-Albert Szent-Gyorgyi

Thank You!

