$$pH = -\log[H^+]$$

Washington State Department of HEALTH

pH BASICS

Water Recreation Program

What is Water?

H_2O

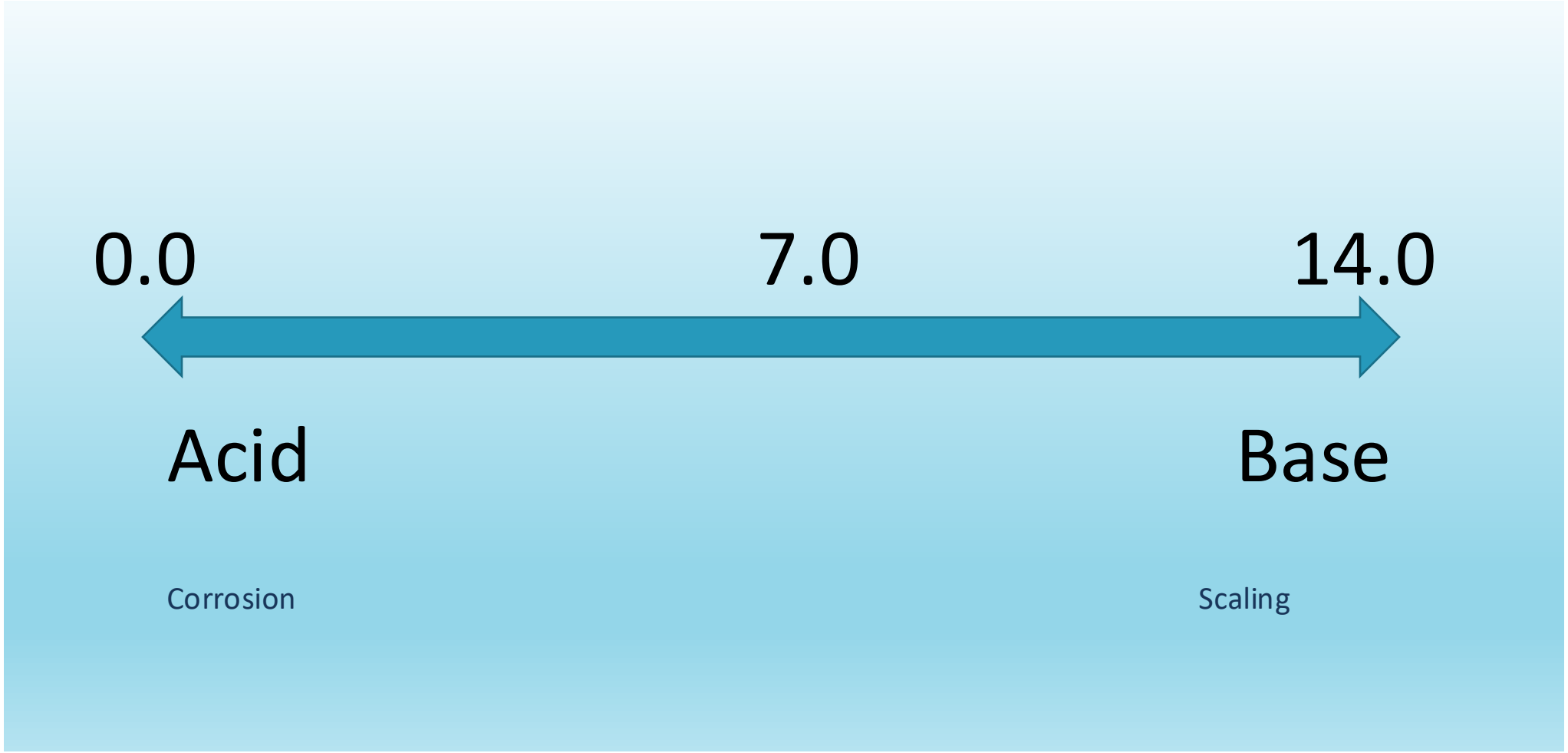
$H^+ + OH^-$

Section 1

WHAT IS pH?

THE MOST IMPORTANT POOL CHEMISTRY COMPONENT

Acid or Base?



The pH Scale

- First introduced in 1909 by SPL Sorenson
- The “p” in pH is never capitalized
- pH roughly stands for “the power of Hydrogen”
- pH is:
- The **negative logarithm** of the **Hydrogen ion concentration** in an **aqueous solution**

What is pH?

- Only Aqueous Solutions have pH
- Hydrogen Ion Concentration
- NEGATIVE Logarithm

Negative Logarithm?

- Logarithms are a mathematical shorthand for writing very big or very small numbers
  - **10^{2} or 10^{-2}**
- It is the number of times you multiple a base number by itself to get the number you want

Section 2

HOW TO MEASURE pH?

MORE ABOUT THE pH SCALE

The Negative Logarithm of the Hydrogen ion concentration

- **pH scale is derived from the exponent**
  - **$10^{-7} = .0000001$**
  - **$10^{-7.5} = .00000000316227$**

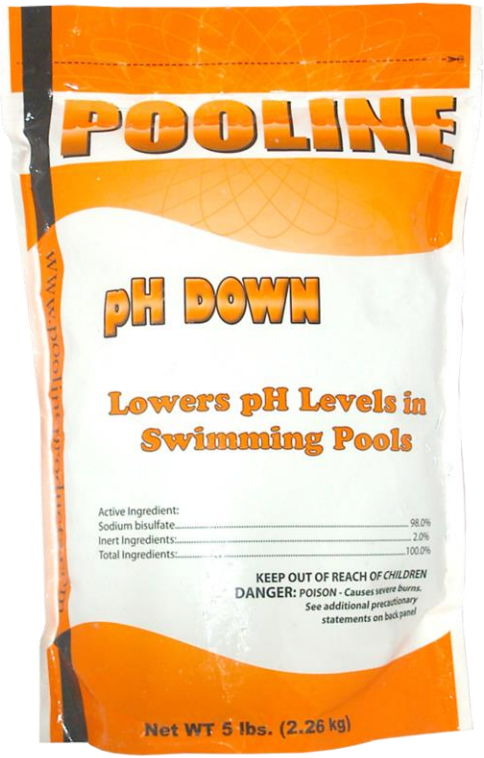
Why do you need to know all this exponent rubbish?

- Small change in pH mean very big impacts on you pool
- Damage to the pool – corrosion or scaling
- Discomfort to swimmers – eye irritation, skin irritation
- Big changes to the power of your disinfectant! Disease, cloudy water, algae.

Ideal Range
7.4 – 7.6

Legally Allowed Range
7.2 – 8.0

Controlling pH



To Lower pH – Add Acid:

Muriatic Acid

(HCL)

Sodium Bisulfate ($NaHSO_4$)

- **To Raise pH – Add a Base**

Soda Ash

(Na_2CO_3)

Presenter

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