



Acids & Bases

They are everywhere..

In your food

In your house

EVEN IN YOU!!!!

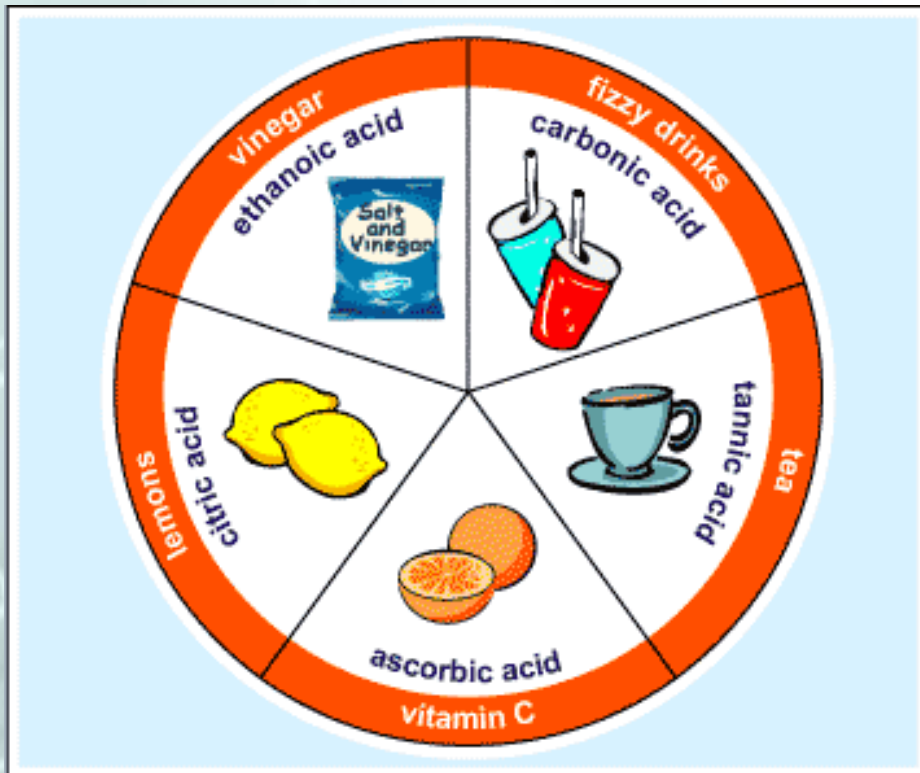
[Intro Video](#) up to 1:10

What is an acid?

- **An acid is a solution that has an excess of Hydrogen (H^+) ions.**
- **The more H^+ ions, the more acidic the solution.**



Properties of an Acid



- Tastes Sour
- Conducts Electricity
- Corrosive; (they break down certain substances. Many acids can corrode fabric, skin, and paper).
- Some acids react strongly with metals.
- **Turns blue litmus paper red**

Uses of Acids



Acids

- Acetic Acid = Vinegar
- Citric Acid = lemons, limes, & oranges. It is in many sour candies such as lemonhead & sour patch.
- Ascorbic acid = Vitamin C which your body needs to function.
- Sulfuric acid is used in the production of fertilizers, steel, paints, and plastics.
- Car batteries

What is a base?

- A base is a solution that has an excess of Hydroxide (**OH⁻**) ions.
- Another word for base is **alkali**.
- When you mix an acid with a base, you get:
 $H + OH = \underline{\hspace{2cm}}$



Properties of a Base



Bases

- Feel Slippery
- Taste Bitter
- Corrosive
- Can conduct electricity.
(Think alkaline batteries.)
- Do not react with metals.
- **Turns red litmus paper blue.**

Uses of Bases



- Bases give soaps, ammonia, and many other cleaning products their power
- The OH^- ions interact strongly with certain substances, such as dirt and grease.
- Chalk and oven cleaner are examples of familiar products that contain bases.
- Your blood is slightly basic

So how can we tell which is an acid and which is a base?

- Ideas?

The pH Scale



Most basic

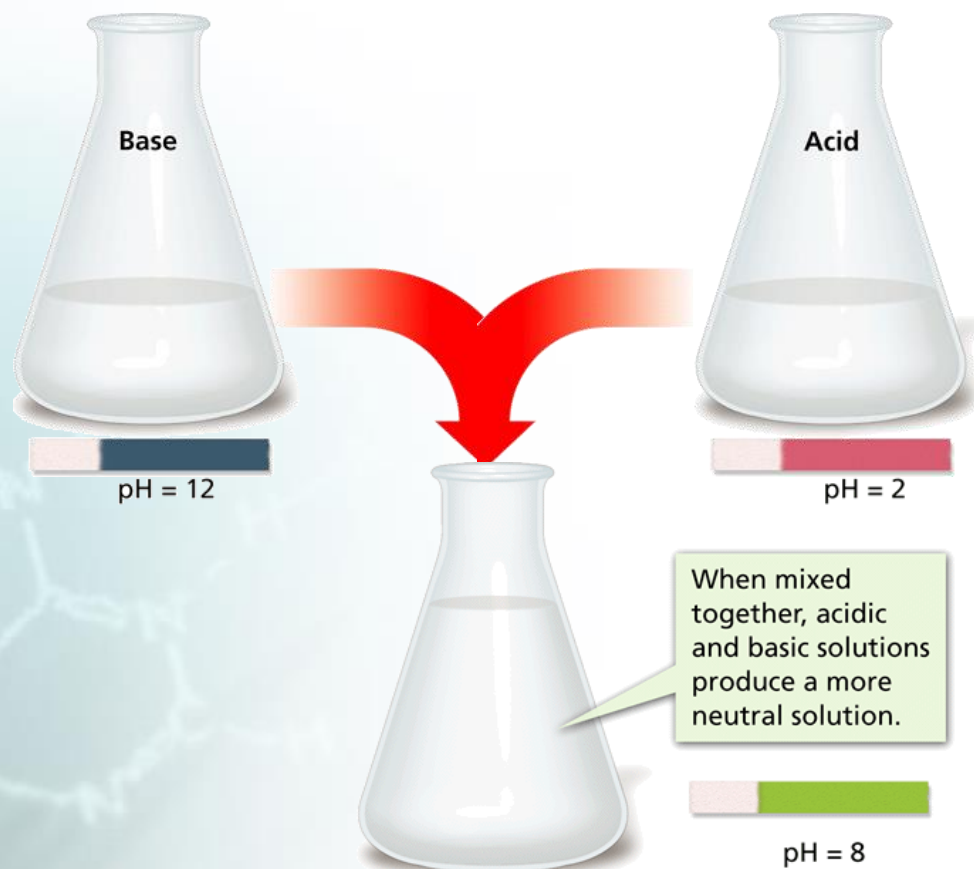
pH Scale



- **pH** is a measure of how acidic or basic a solution is.
- The pH scale ranges from 0 to 14.
- **Acidic solutions have pH values below 7**
- A solution with a pH of 0 is very acidic.
- A solution with a pH of 7 is neutral.
- **Pure water has a pH of 7.**
- **Basic solutions have pH values above 7.**

Acid – Base Reactions

- A reaction between an acid and a base is called *neutralization*.
- An acid-base mixture is not as acidic or basic as the individual starting solutions.
- The products of a neutralization reaction are
 - Water (H_2O)
 - A salt



Acid – Base reactions

Common Salts	
Salt	Uses
Sodium chloride NaCl	Food flavoring; food preservative
Potassium iodide KI	Additive in "iodized" salt that prevents iodine deficiency
Calcium chloride CaCl ₂	De-icer for roads and walkways
Potassium chloride KCl	Salt substitute in foods
Calcium carbonate CaCO ₃	Found in limestone and seashells
Ammonium nitrate NH ₄ NO ₃	Fertilizer; active ingredient in cold packs

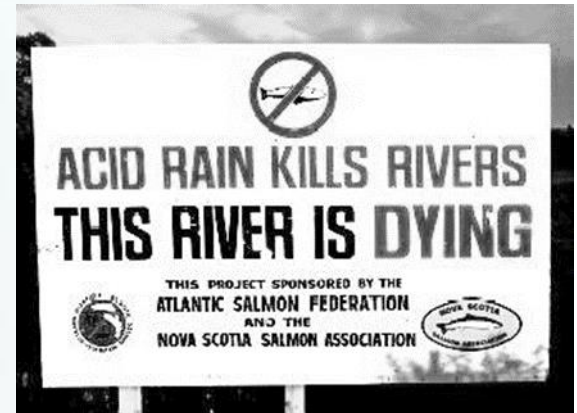
Each salt listed in this table can be formed by the reaction between an acid and a base.

What is acid rain?

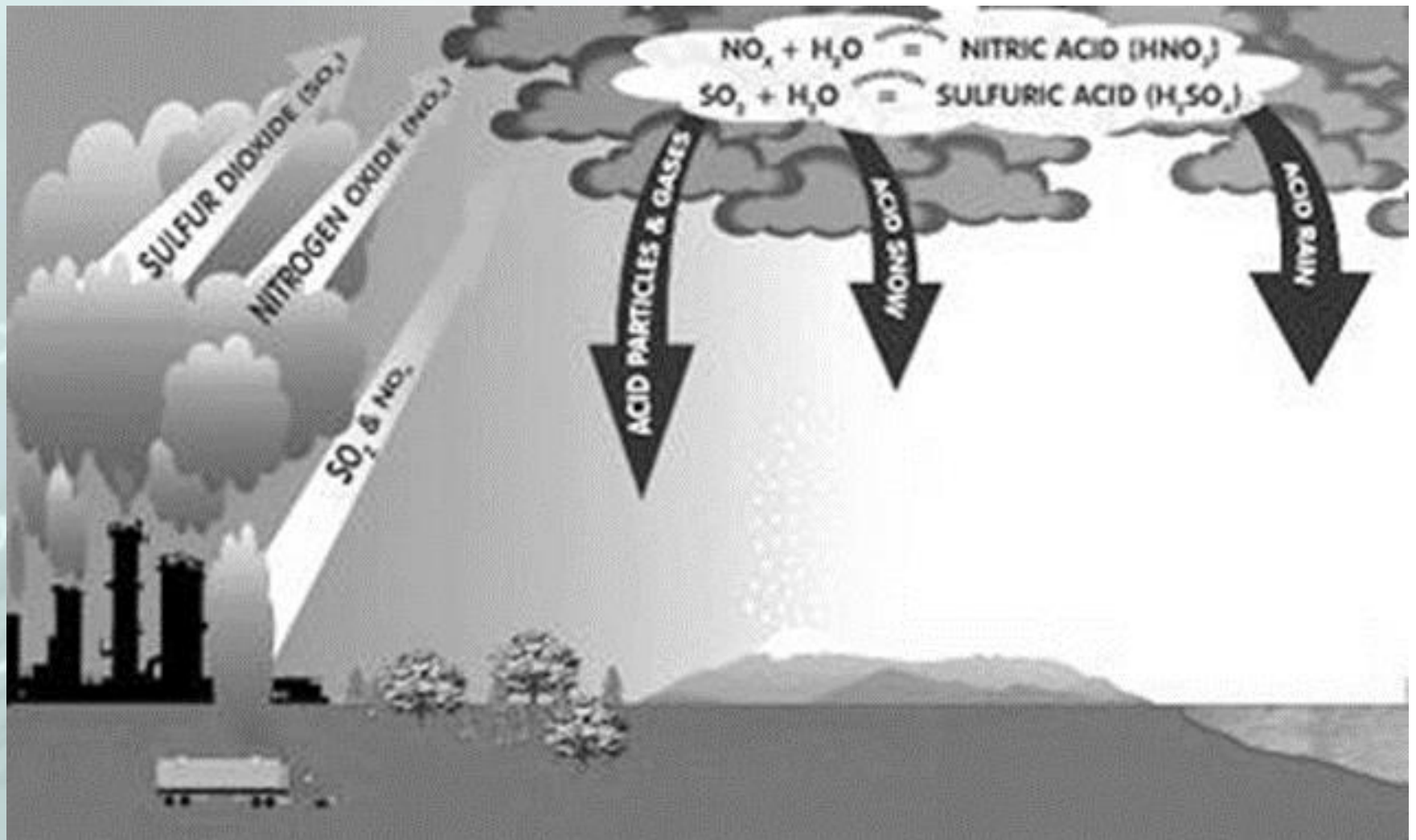
- Rain or snow that has a pH below 5.6 is considered acid rain



How acid rain affects stonework.
The picture on the left was taken in 1908.
The picture on the right was taken in 1968



How is Acid Rain Formed?



In Your Own Words...

- Write a description of how acid rain forms

Why is Acid Rain a Problem?

- Damages plants
- Dissolves egg shells
- Corrodes statues/buildings if they are made of certain materials
- Can harm or kill aquatic life

LAB TIME

- You will need to understand how we use the TWO Litmus papers properly before proceeding with your lab.