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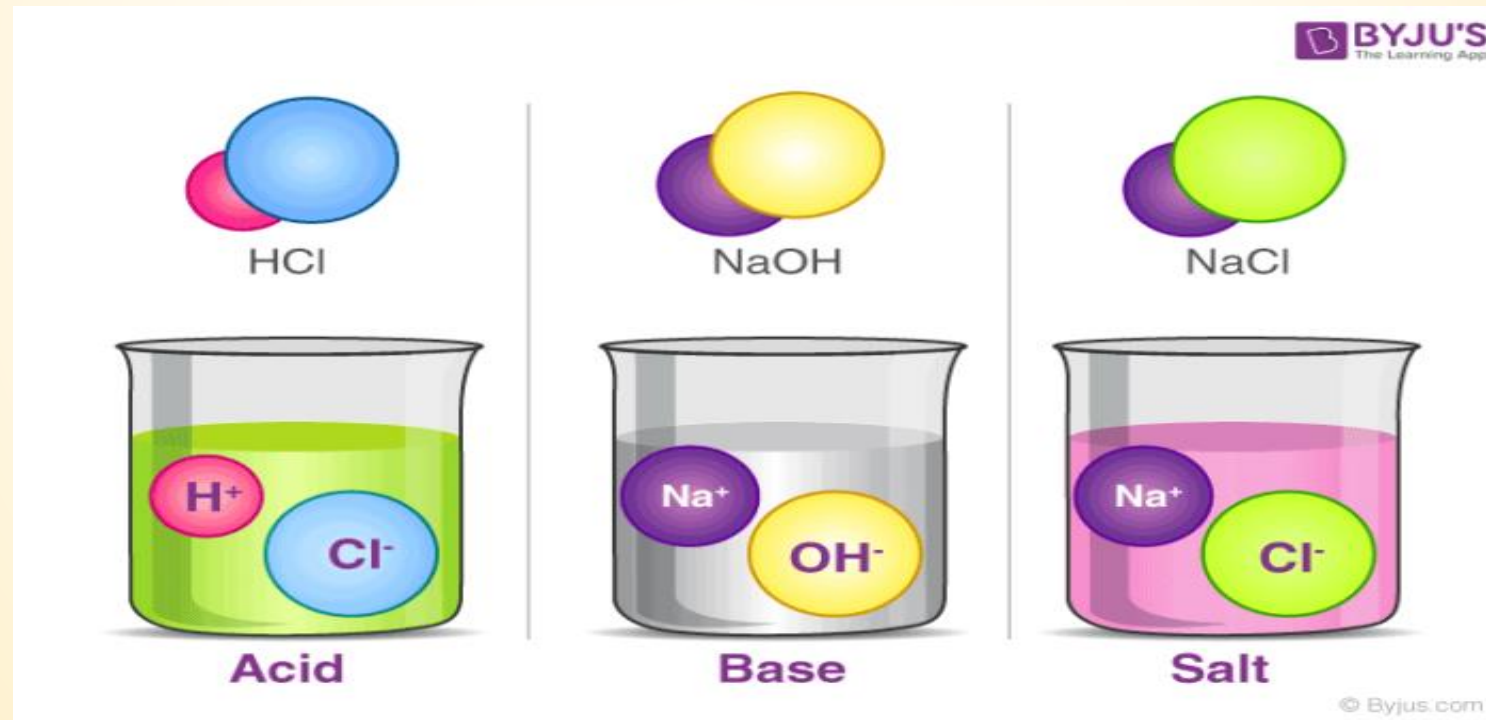
**CLASS 7th**  
**science**



# Acids, Bases and Salts

**May, 21**

Acids, Bases and salts are three important groups of chemical compounds which are useful to us in many ways. For example our stomach makes acid to digest food, baking soda is used in cakes and the common salt used in cooking.





# Acids

A substance which **reacts with a base** to form a salt is called acid. It is **sour** in taste and it **turns blue litmus to red**.

## Organic Acids

The acids present in **plant** materials and **animals** are natural acids and are called Organic Acids.

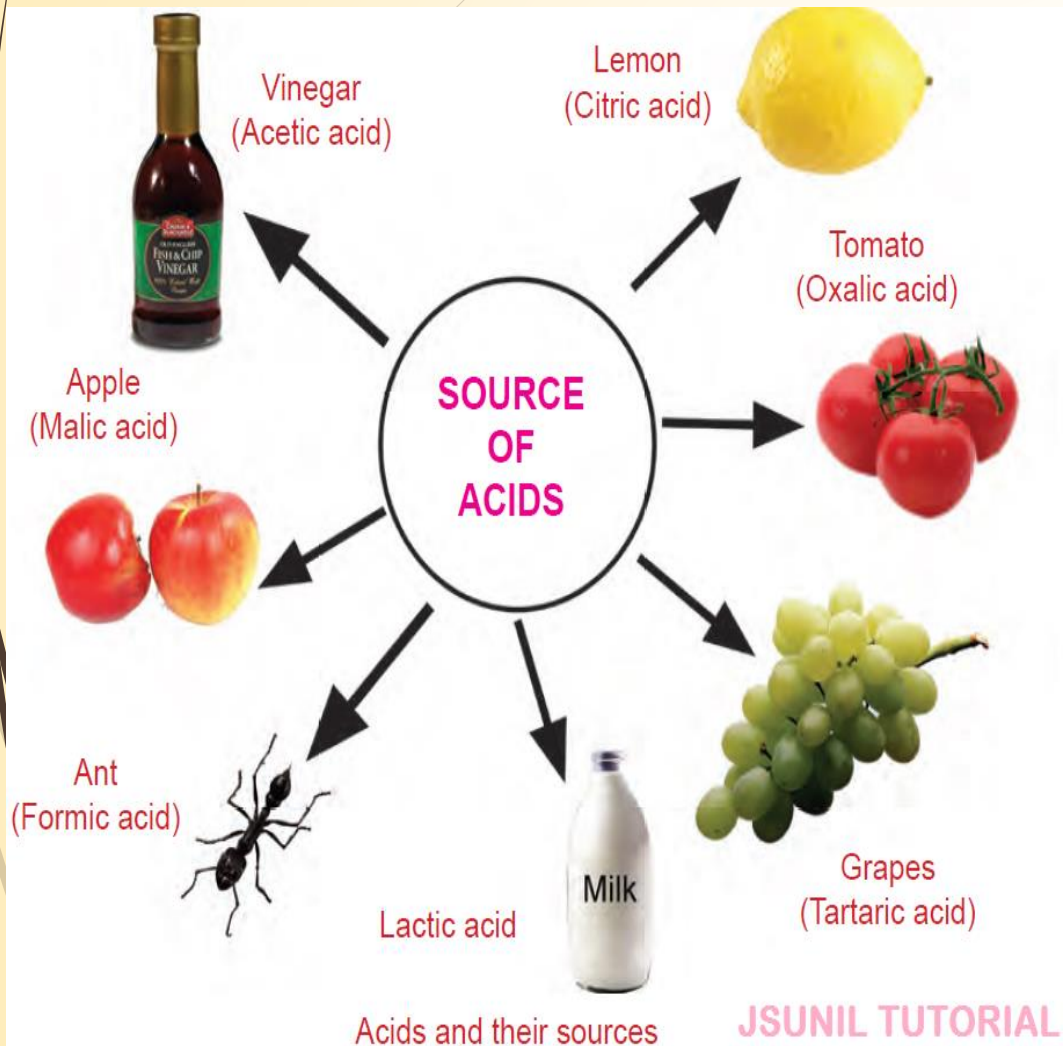
Organic acids are **weak acids** and they are **not harmful** to us.

## Mineral Acids

The acids prepared from the **minerals of the earth** are called mineral acids. They are also known as **laboratory acids**.

Concentrated mineral acids are **very dangerous**. They should be handled with great care.

# Different sources of acids





## Bases

A substance which **neutralize** an acid to form a salt is called a base. They have **bitter** taste and turn **red litmus to blue**.

A base which is **soluble in water** is called an **alkali**.

Bases can also be **strong and weak**. Those bases which are **highly corrosive** are strong bases like **Sodium hydroxide and potassium hydroxide** whereas bases which are **less corrosive** are weak bases like **Calcium hydroxide, Magnesium Hydroxide**.

## Basic Foods



These foods have a pH  
between 0 and 5.

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## Examples of Bases



Chalk



Drano



Soap

Bleach





## Indicators

These are special types of chemicals which are used to test whether a given substance is an acid or base. They **change their colour** when it is put into an acid or a base.

Indicators can be natural or synthetic.

1. Litmus, China rose and turmeric are naturally occurring indicators.
2. Phenolphthalein is a synthetic indicator.

# Litmus

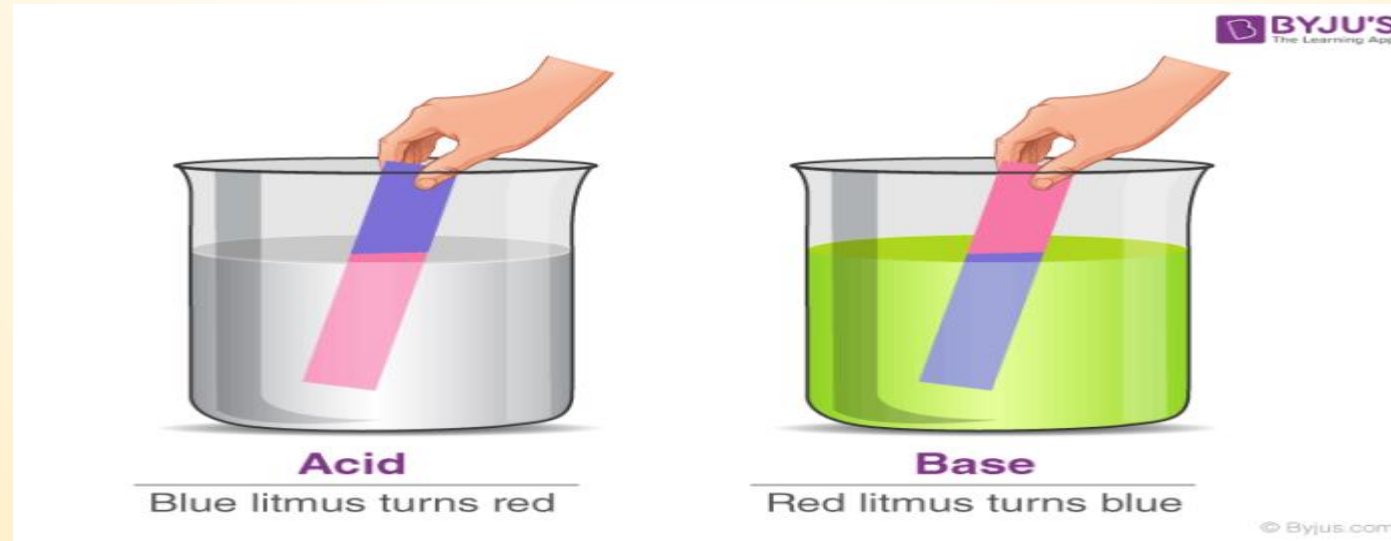
Litmus solution is a purple coloured dye which is extracted from **lichens**.

When litmus is added to an acidic solution, it turns red. And when added to a basic solution, it turns blue.

Litmus is also available in the form of paper strips. (blue litmus paper and red litmus paper)

**Acids turn blue litmus to red.**

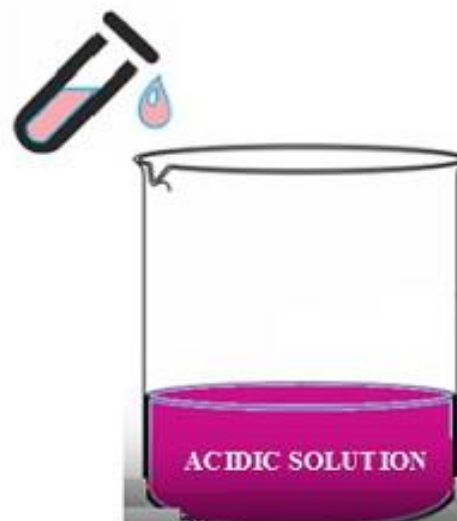
**Bases turn red litmus to blue**



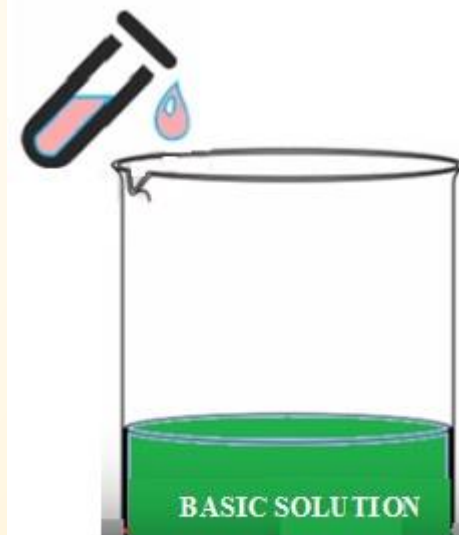
## China Rose Indicator

It is a light pink coloured solution which is extracted from the red flowers of china rose plant with water.

1. Acids turn china rose indicator to magenta.
2. Bases turn china rose indicator to green.



China rose indicator when reacts with acids



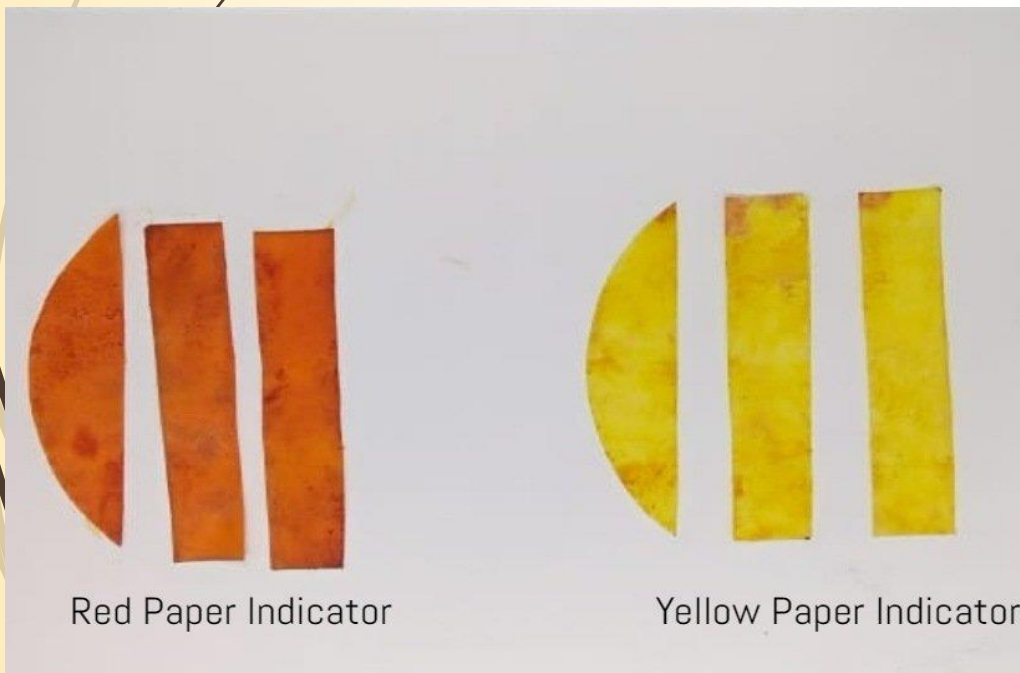
China rose indicator when reacts with bases

## Turmeric as Indicator

Turmeric turn **red in basic solution**. It is used in the form of turmeric paper as indicator.

- 1. Turmeric paper is yellow in acid solution.**
- 2. Bases turn the yellow turmeric paper to red.**

That is why the yellow stain on a white shirt ,turns red when soap is applied on it. As soap is a base.



# Phenolphthalein Indicator

This is a synthetic acid – base indicator.

1. Phenolphthalein indicator is colourless in acid solution.
2. Phenolphthalein indicator gives pink colour in basic solution.





## Difference between Acids and Bases

Acids	Bases
Acids turn blue litmus to red.	Bases turn red litmus to blue.
Acids are sour in taste.	Bases are bitter in taste.
Chemical nature of such substances is acidic.	The chemical nature of such substances is said to be basic.
They are not soapy to touch.	They are soapy to touch.
Example: Hydrochloric acid, acetic acid.	Example: Soaps at our homes, Sodium Hydroxide.



## Neutral Substances

Those substances which are **neither acidic** nor **bases** are called neutral substances.

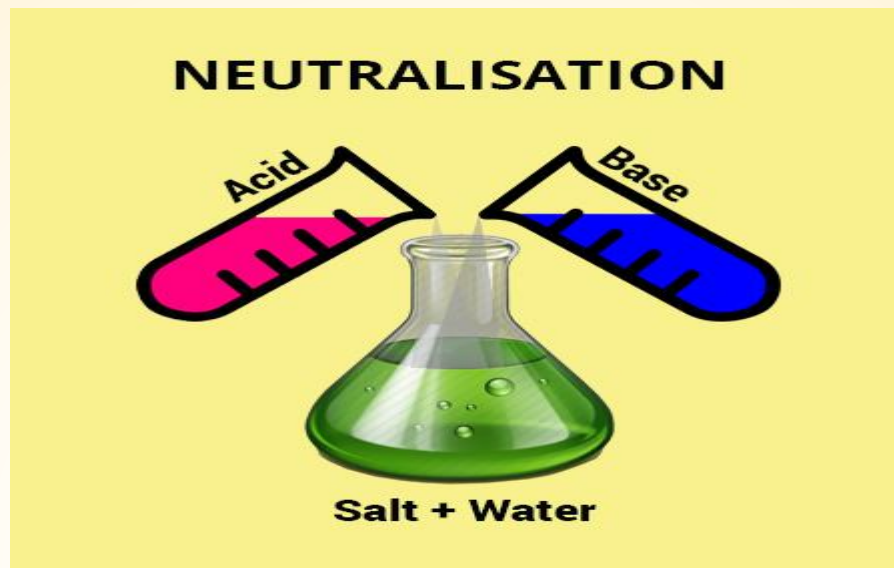
Neutral substances **do not change** the **colour** of any **indicator**.

Some of the neutral substances are: Pure water, Glucose, Cane sugar and Common salt.

## Neutralization

The reaction in which an acid reacts with a base to form salt and water is called neutralization.

The acids and bases are chemically opposite substances.



## Neutralisation Reaction Examples

chemistry page



**Base**

**Acid**

**Salt**

**Water**

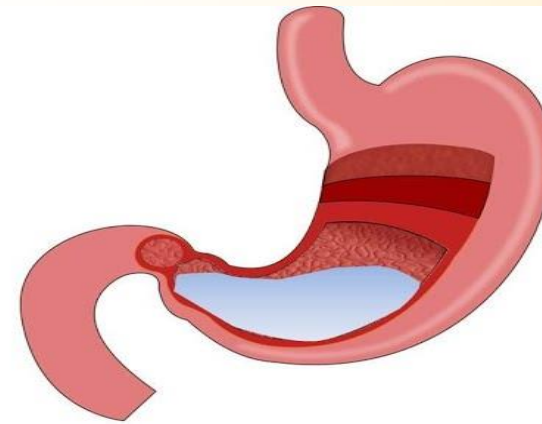
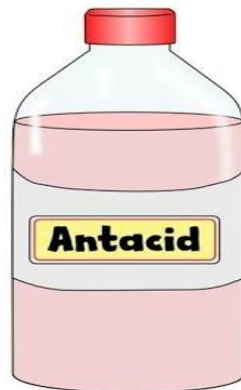
## Neutralization in every day life

**1. Indigestion** – Our stomach produce hydrochloric acid. But sometimes, excess of Hydrochloric acid is produced which causes indigestion.

In order to cure indigestion and get rid of pain, we can take bases called antacids.

Some common antacids are milk of magnesia, baking soda.

Too much acid  
produced in stomach



Take basic substance  
to destroy acid

## 2. Ant's Sting

The sting of an ant contains an acid called formic acid which causes burning sensation. If an ant stings a person, then rubbing a mild base like baking soda solution on the stung area of the skin gives relief.

### Neutralisation in Everyday Life



When ants bite, they inject formic acid into the skin.  
To treat it we apply baking soda on the skin, which is a base.

### 3. Soil Treatment

The excessive use of fertilizers in the field makes the soil acidic. When the soil is too acidic, it is treated with bases such as quicklime or slaked lime.

If the soil is too basic, then decaying organic matter (compost) is added to it. As organic matter releases acid.



## 4. Factory waste

The waste discharged by many factories contain acids. If these untreated wastes are discharged into water bodies, then they will turn the water acidic. The acidic factory wastes should be treated with basic substances to neutralize them before discharging into water bodies.



## Salts

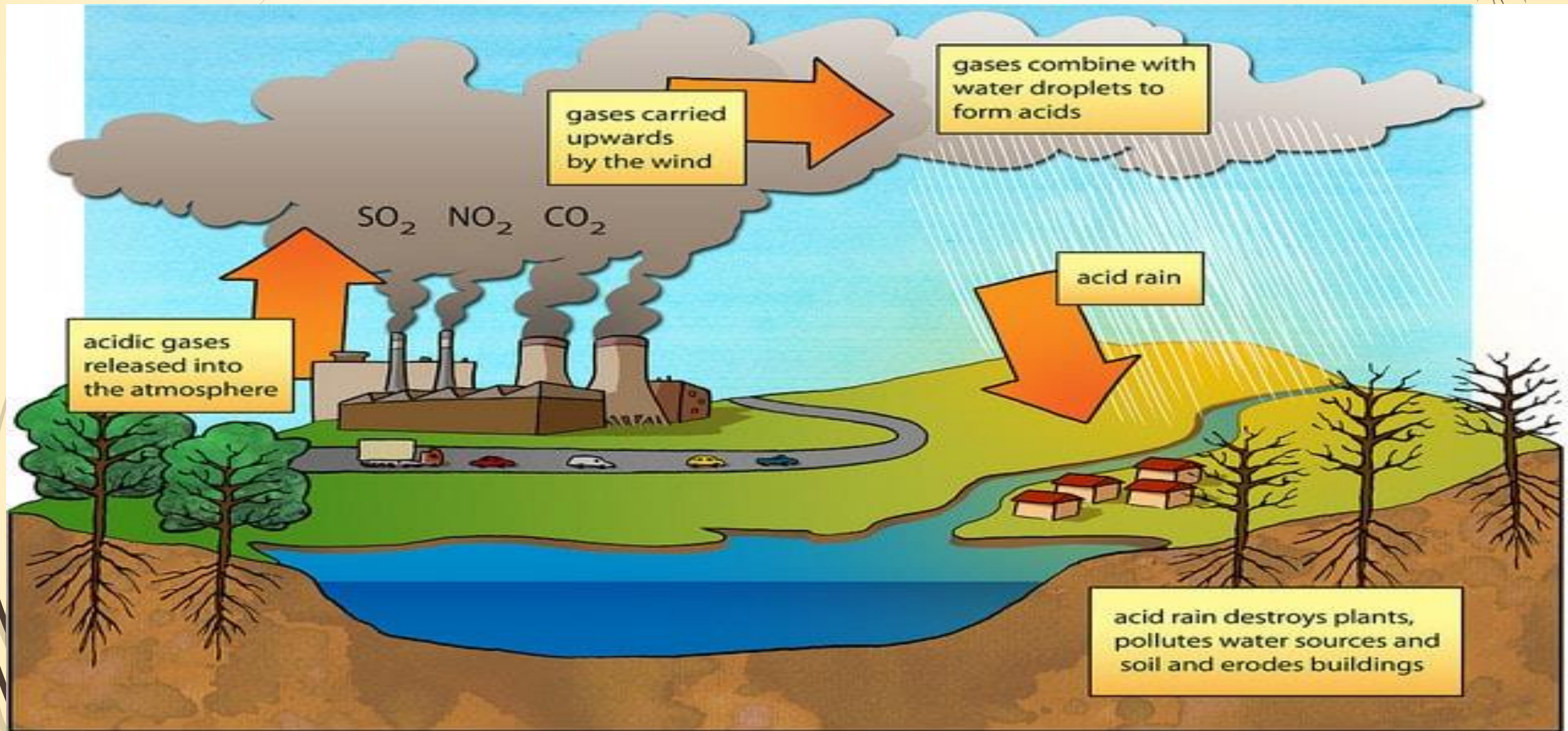
A salt is a substance formed by the **reaction** of an **acid with a base**. Those salt which form a neutral solution on dissolving in water are called **neutral salts**. Those salts which form an acidic solution on dissolving in water are called **acidic salts**. Those salts which form basic solutions on dissolving in water are called **basic salts**.

Acid	Base	Salt	Example
Strong	Strong	Neutral	$\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O}$
Strong	Weak	Acidic	$\text{HCl} + \text{NH}_4\text{OH} \rightarrow \text{NH}_4\text{Cl} + \text{H}_2\text{O}$
Weak	Strong	Basic	$\text{CH}_3\text{COOH} + \text{NaOH} \rightarrow \text{CH}_3\text{COONa} + \text{H}_2\text{O}$
Weak	Weak	Neutral	$\text{CH}_3\text{COOH} + \text{NH}_4\text{OH} \rightarrow \text{CH}_3\text{COONH}_4 + \text{H}_2\text{O}$

# Causes Of Acid Rain

- Acid rain is caused by a chemical reaction that begins when compounds like sulfur dioxide and nitrogen oxides are released into the air.
- These substances can rise very high into the atmosphere, where they mix and react with water, oxygen, and other chemicals to form more acidic pollutants, known as acid rain.

# Acid rain



# Effects Of Acid Rain

- It causes respiratory problems to humans and animals.
- It destroys marine life.
- It damages buildings and stone statues





# THANK YOU

CLASS 7<sup>th</sup>  
Science

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