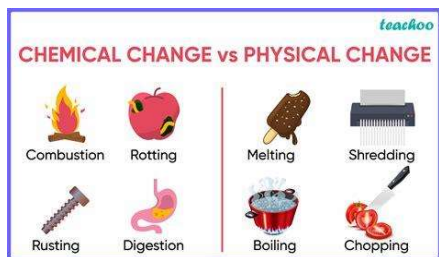


Chemical & Physical Changes

· A physical change is a change of state. Melting ice and boiling water are examples of a physical change.

· Chemical reactions can be identified by: a **new** substance being formed, a change in energy (temperature, light or sound), the formation of a precipitate (solid forming), a gas given off and/or a colour change.



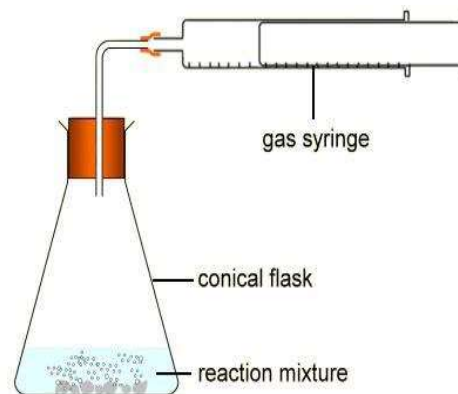
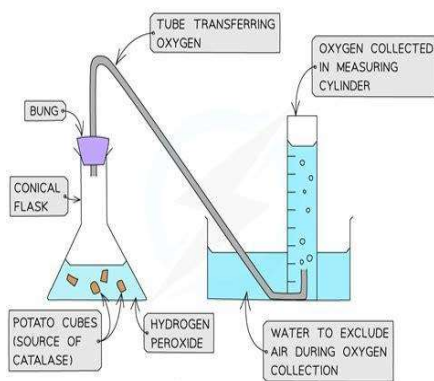
· Word equations can be written to show what happens in a chemical reaction.

Reaction Rate

· Reaction rate means how quickly a chemical reaction progresses. Reaction rate can be changed by changing the temperature, concentration, particle size or by adding a catalyst.

Measuring the rate of a reaction over time.

· Reactions can be monitored by measuring the change volume of one of the reactants or the products



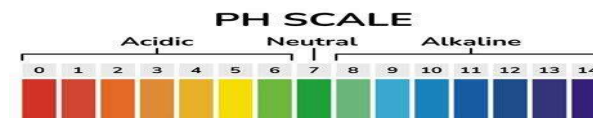
Acids, Alkalis and the pH Scale

· The pH scale is a measure of how acidic or basic (alkaline) a solution is. It ranges from 0 to 14

· **Acids** are substances with a pH of **less than 7**.

· **Alkalis** are solutions with a pH of **more than 7**.

· A solution that has a **pH of 7** is said to be **neutral**.



· pH of substances can be tested with pH paper or with universal indicator and compared to the pH scale.

· Acids will turn pH paper **red**, **orange** or **yellow**,

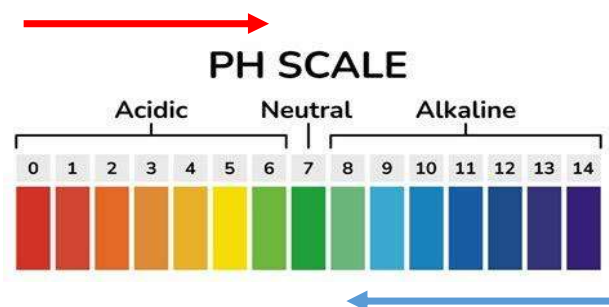
· Neutral solutions will turn pH paper **lime green**

· Alkaline solutions will turn pH paper **blue** or **purple**.

Dilution and pH

· We dilute a solution by adding water which will lower the concentration of a solution. This will raise the pH of an acid, or reduce the pH of an alkali.

Diluting an acid, increases the pH to nearer pH7



Diluting an alkali, decreases the pH to nearer pH 7

Neutralisation

· Neutralisation is used every day in real life, such as on farms to change the pH of soil, at home in baking, cleaning, treating indigestion, treating some insect stings, and in industry to remove (scrub) harmful gases or clean spills.

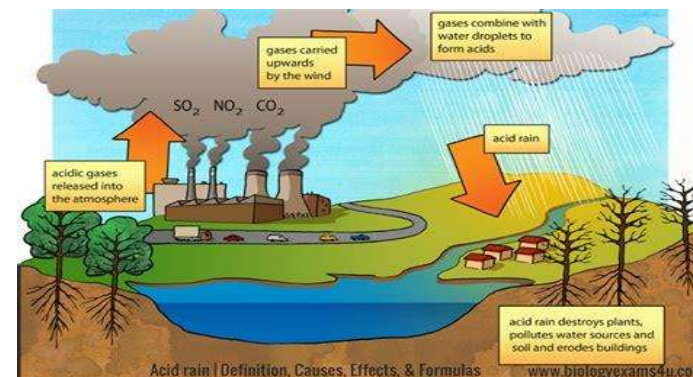


Word equation

Acid + Alkali $\rightarrow$ Salt + Water

Acid Rain and its effects

· Acid rain is formed when non-metal oxides (such as nitrogen dioxide or sulfur dioxide) dissolve in water.



· The effects of acid rain can be harmful to the environment, including:

- Damage to forests and soil, affecting plant growth.
- Harm to aquatic ecosystems, as lower pH levels can be detrimental to fish and other aquatic life.
- Erosion of buildings and monuments, especially those made of limestone and marble.