Chemical reactions – acids and alkalis

We can use an **indicator** to find out whether a solution is acidic or alkaline.

Universal indicator is a different colour at each pH. The scale on the right shows the colours of universal indicator in solutions of different pH.

Other indicators, such as **litmus paper**, tell us if something is acid, **or** alkali, not what the pH is.

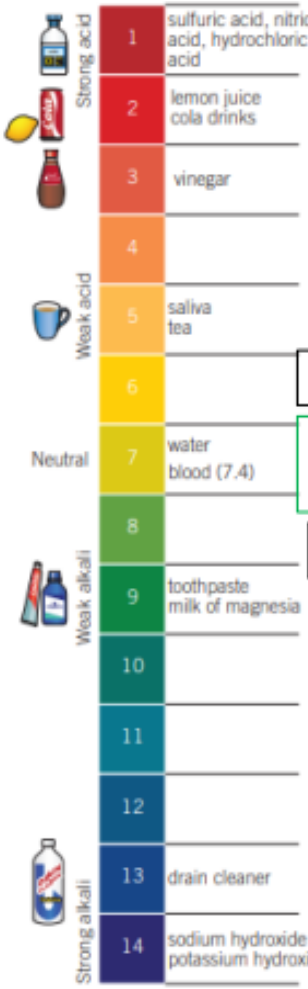
The **pH scale** is a measure of how acidic or alkaline a solution is.

Concentration is the amount of acid dissolved in water to make 1 litre of solution. It is a measure of the number of particles in a given volume of solution.

The more concentrated the solution, the stronger it is.

The weaker the solution, the more it has been diluted with water.

In a **neutralisation** reaction, an acid reacts with a substance that cancels it out. The pH gets closer to 7.



← Very strong acid pH 1

Vomit, vinegar, and lemons all taste **sour** because they contain **acids**. Vomit includes an acid from the stomach, **hydrochloric acid**. This acid helps digest foods. Vinegar is a solution of **ethanoic acid** and other substances. Lemons contain **citric acid**.

← Very weak acid

Some solutions are **neutral**. They are neither acidic nor alkaline. **They are pH 7.0.**

← Very weak alkali

Alkalis are the chemical opposite of acids. Soap solution is an alkali, and so is toothpaste. Most alkalis feel soapy.

← Very strong alkali pH14

Skills Development:
Use data and observations to determine the pH of a solution
Use experimental data to calculate temperature change and determine the type of reaction taking place

Extend to GCSE:
All of these topics will be re-visited in GCSE Chemistry.
Q) Describe the way pH changes when a strong acid is added slowly to a strong alkali.

Some acidic and alkaline solutions are labelled with a different **hazard** symbol. The symbol on the right shows that the solution in the bottle is **corrosive**. It could burn your skin and eyes.

The symbol on the left shows that the solution is an **irritant**. An irritant might cause slight swelling or redness if it gets on your skin.

Keyword	Definition
Acid	Corrosive substance which has a pH lower than 7. Acidity is caused by a high concentration of hydrogen ions.
Acidic	Having a pH lower than 7.
Alkali	A base which is soluble in water.
Alkaline	Having a pH greater than 7.
Base	A substance that reacts with an acid to neutralize it and produce a salt.
Neutralise	To be make neutral by removing any acidic or alkaline nature.
Neutral	When a substance is neither acidic nor alkaline, and has a pH of 7.
Litmus Paper	An indicator that can be red or blue. Red litmus paper turns blue in alkalis, while blue litmus turns red in acids.
pH	A scale of acidity or alkalinity. A pH value below 7 is acidic, a pH value above 7 is alkaline.
Universal Indicator Paper	Paper stained with universal indicator, a chemical solution that produces many different colour changes corresponding to different pH levels.