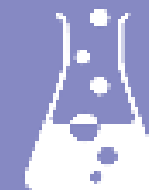


## Knowledge organiser

## Reactions



**Y7 topic:** ACIDS AND ALKALIS

### **I have already learned:**

**In KS2:** Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with the action of acid on bicarbonate of soda.

**Y7:** Particle Model and Changes of State

### **This topic links to:**

**Y8:** Types of Reaction and Chemical Energy

**KS4:** Chemical Changes, RP1 'Making Salts'

### **It is important to study about acids and alkalis because...**

Acids and alkalis are present in many everyday items such as foods, cleaning products, insect stings, and even inside your body (stomach acid)! In this topic you will learn how to identify acids and alkalis, how to keep yourself safe when using these chemicals and how new products can be formed during neutralisation reactions.

### **Possible careers involving acids and alkalis are...**

- Agricultural Technician
- Biochemical Engineer
- Chemist
- Environmental Compliance Inspector
- Food Scientist

**KNOWLEDGE ORGANISER**  
**BIG IDEA: REACTIONS**  
**TOPIC: ACIDS AND ALKALIS**

Common **indicators** that are used include litmus blue, litmus red and universal indicator.

Litmus blue changes to red in acids. Litmus red changes to blue in alkalis. Universal indicator is red-yellow in acids, green in neutral solutions and blue-purple in alkalis.



**corrosive**



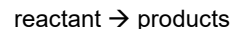
**irritant**

The pH Scale

Strong acid				Weak acid			Neutral	Weak alkali			Strong alkali			
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14

Key Word	Definition
<b>corrosive</b>	A substance that can burn skin or eyes.
<b>irritant</b>	A substance that can make skin itch or swell a little.
<b>acid</b>	A solution that has a pH of less than 7. Examples of acids are vinegar and stomach acid.
<b>pH</b>	A scale that measures how acids or alkaline a substance is. It measures from 0 to 14.
<b>indicators</b>	A substance used to identify whether an unknown solution is acidic or alkaline.
<b>base</b>	A substance that neutralises and acid.
<b>alkali</b>	A base that dissolves in water. These solutions have a pH of 8 to 14.
<b>neutralisation</b>	A reaction where an acid and base react to form a neutral substance.
<b>concentration</b>	A measure of the number of particles in a given volume.

A chemical reaction is a change in which atoms are rearranged to make new products.



During chemical reactions you may observe:

- flames or sparks
- a smell
- the substance may feel hotter or colder
- a bang
- fizzing (gas produced)

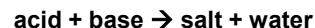
Chemical reactions are not easily reversible. Changes of state (melting, freezing etc) are not chemical reactions because they can be easily reversed.

The **pH scale** is used to measure the acidity or alkalinity of a solution. It tells us if a substance is a strong or weak **acid**. Strong **acids** have lower pH values. A strong **alkali** has a high pH value. A neutral substance has a pH of 7.

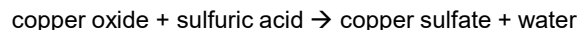
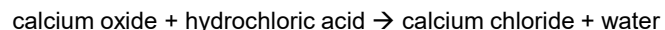
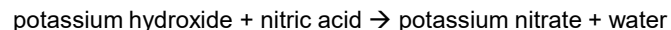
Examples of strong acids are hydrochloric acid, sulfuric acid and nitric acid. Examples of weak acids are acetic acid and citric acid.

**Bases** are the chemical opposites of **alkalis**, metal oxides are examples of bases.

The general word equation for a **neutralisation** reaction is:



This is called a **neutralisation** reaction as the products made are neutral. Examples of **neutralisation** reactions:



You will carry out a practical to make copper sulfate using copper oxide and sulfuric acid and should be able to name the equipment used and describe the practical steps undertaken.

A salt is a substance formed in a chemical reaction between an acid and a base. It is a neutral substance.

To name a salt, the first part of the name comes from the metal used in the base and the second part of the name comes from the acid.

- sulfuric acid makes sulfate salts.
- nitric acid makes nitrate salts.
- hydrochloric acid makes chloride salts.