Year 7 Science knowledge organiser

Module – Reactions
Topic – Metals and non-metals and acids and alkalis
Length of topic – Approx. 12 lessons
Method of assessment – Summative assessment

Links to prior learning

KS2 Year 5 Properties of Materials topic

- 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 burning and the action of acid on bicarbonate of soda.

Knowledge to be taught.

- Metals and non-metals react with oxygen to form oxides which are either bases or acids.
- Metals can be arranged as a reactivity series in order of how readily they react with other substances.
- Some metals react with acids to produce salts and hydrogen.
- The pH of a solution depends on the strength of the acid: strong acids have lower pH values than weak acids.
- Mixing an acid and alkali produces a chemical reaction, neutralisation, forming a chemical called a salt and water.

Skills to be covered

- Testing a hypothesis
- Writing a scientific conclusion
- Evaluating how an investigation has gone

Working scientifically strands covered

Analyse patterns	✓
Discuss limitations	✓
Draw conclusions	✓
Present data	✓
Communicate ideas	✓
Construct explanations	✓
Critique claims	✓
Justify opinions	
Collect data	✓
Devise questions	✓
Plan variables	✓
Test hypothesis	✓
Estimate risks	✓
Examine consequences	✓
Review theories	
Interrogate	

Assessment

Pupils will need to show they can:

- Show how metals and non-metals react with oxygen to form oxides which are either bases or acids.
- Order metals in the reactivity series in order of how readily they react with other substances.
- Name the salts produced when metals react with acids.
- The pH of a solution.
- The equation when mixing an acid and alkali.

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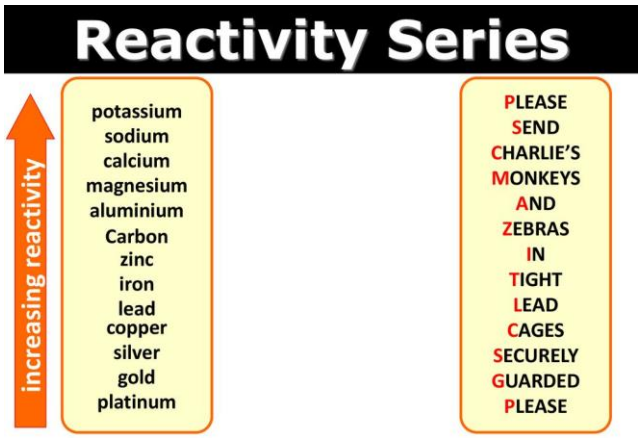
Facts

Iron, nickel and cobalt are magnetic elements.

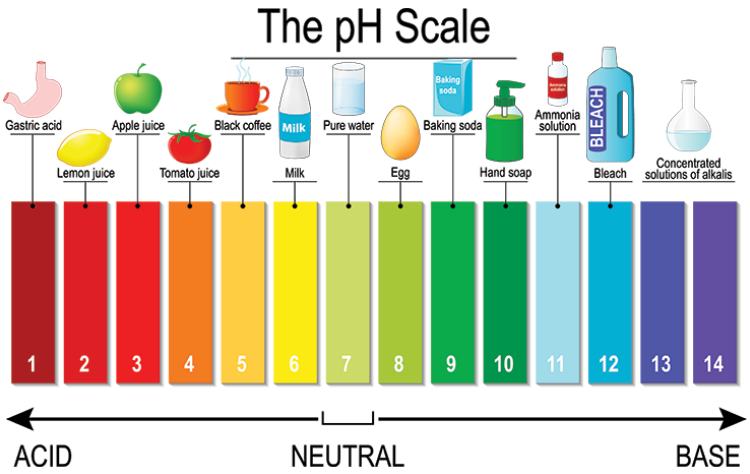
Mercury is a metal that is liquid at room temperature.

Bromine is a non-metal that is liquid at room temperature.

Metals can be arranged as a reactivity series in order of how readily they react with other substances.



Acids have a pH below 7, neutral solutions have a pH of 7, alkalis have a pH above 7.



Acids and alkalis can be corrosive or irritant and require safe handling.

Hydrochloric, sulfuric and nitric acid are strong acids.

Acetic and citric acid are weak acids.

Keywords

Acid: Corrosive substance which has a pH lower than 7. Acidity is caused by a high concentration of hydrogen ions.
Alkali: A base which is soluble in water.
Base: A substance that neutralises an acid – those that dissolve in water are called alkalis.
Concentration: A measure of the number of particles in a given volume.
Corrosive: Able to damage metal, stonework, clothes and skin. Strong acids and alkalis are corrosive.
Displacement: Reaction where a more reactive metal takes the place of a less reactive metal in a compound.
Indicators: Substances used to identify whether unknown solutions are acidic or alkaline.
Metals: Shiny, good conductors of electricity and heat, malleable and ductile, and usually solid at room temperature.
Neutralise: To be made neutral by removing any acidic or alkaline nature
Non-metals: Dull, poor conductors of electricity and heat, brittle and usually solid or gaseous at room temperature.
Oxidation: Reaction in which a substance combines with oxygen.
pH: Scale of acidity and alkalinity from 0 to 14.
Reactivity: The tendency of a substance to undergo a chemical reaction.
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