

Subject: Science
Year: KS3 - Year 8
Topic: C4 Acids and Alkalis

Lesson Sequence

1. Everyday Acids and Alkalis
2. Universal Indicator
3. Red Cabbage Indicator
4. Acid Concentration
5. Neutralisation
6. Naming Salts
7. Indigestion
8. Indigestion Assessment
9. Acid Rain

Key Assessments

Indigestion Assessment
EA Exam 1

Core Texts

SMART Science Textbook

pH Scale

Colour	Dark Red	Red	Red	Orange Red	Orange	Orange yellow	Greenish yellow	Green	Greenish blue	Blue	Navy blue	Purple	Dark purple	Violet	Violet
pH	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14

Key Words

Acid	Substances with a pH less than 7, they neutralise alkalis.	Limewater	A solution of calcium hydroxide that goes white when carbon dioxide passes through it.
Acid Rain	Rain in which sulfur dioxide (or nitrogen dioxide) has been dissolved making it acidic.	Litmus Paper	Coloured paper that changes colour in acids (red) or alkalis (blue).
Alkali	Substances with a pH greater than 7, they will neutralise acids and are bases that will dissolve in water.	Neutral	A solution of pH 7.
Antacid	A tablet (containing the base, calcium carbonate) given to treat indigestion and neutralise stomach acid.	Neutralisation	Reacting an acid and alkali to form a neutral solution containing a salt.
Base	Solid or powdered substances that neutralise acids, some may dissolve in water to form alkalis.	pH	Scale used to measure the strength of acids and alkalis.
Concentration	How many particles of a certain type are present in a liquid or gas.	Reactivity Series	A list of substances, often metals, in order of their reactivity.
Corrodes	Process in which a compound is worn away by chemical reactions e.g. Rusting.	Salt	A chemical containing a metal and a non-metal element formed by the reaction of an acid and an alkali.
Corrosive	A chemical that causes corrosion.	Sodium chloride	A salt formed by mixing hydrochloric acid and sodium hydroxide, the scientific name for common table salt.
Hazard Symbol	Labels on chemical containers that warn about the ways in which a chemical can be dangerous.	Squeaky pop test	Test for hydrogen, a glowing splint makes hydrogen gas burn with a squeaky pop sound.
Indicator	Chemicals that change colour depending on the pH.	Sulfur dioxide	The common cause of acid rain, along with nitrogen dioxide.
Indigestion	Pain or discomfort in the stomach caused by the production of too much stomach acid.	Tarnish	A layer of oxide forms on a metal making it look dull and not shiny.
Irritant	A substance causing slight inflammation or discomfort to the body.	Universal Indicator	A mixture of dyes that change colour depending upon pH.

Common Acids and Bases (Alkalis)

Acid	Base (alkali)
Hydrochloric Acid	Sodium hydroxide
Lemon Juice	Milk
Vinegar	Soap/Shampoo
Nitric Acid	Bleach
Sulfuric Acid	Calcium carbonate

Naming Salts

The first part of the salts name comes from the metal.
The second part of the salts name comes from the acid.

Acid	Salt Formed
Hydrochloric Acid chloride
Sulfuric Acid sulfate
Nitric Acid nitrate

E.g. magnesium + hydrochloric acid → magnesium chloride + hydrogen

Reactions of Acids

- Acid + alkali → Salt + Water
- Acid + Metal → Salt + Hydrogen
- Acid + Metal hydroxide → Salt + Water
- Acid + Metal oxide → Salt + Water
- Acid + Carbonate → Salt + Carbon dioxide + Water

Making Red Cabbage Indicator – Method

- Collect red cabbage.
- Add boiling water and leave for 5 minutes.
- Crush cabbage and water mixture using a mortar and pestle.
- Filter mixture, discard unfiltered cabbage, use the filtrate.
- Indicator turns *red* in *acidic* conditions, **blue/purple** in **neutral** conditions and yellow/green in basic conditions.