Year 8 Science – Term One KO

1. Tier 3 Vocab

- **Acid** - A substance producing more hydrogen ions than hydroxide ions when dissolved in water.
- **Anomaly** - A result that is unusual or unexpected.
- **Aqueous (aq)** - An aqueous solution forms when a substance dissolves in water.
- **Displacement reaction** - A reaction that occurs when a more reactive element replaces a less reactive element in a compound.
- **Endothermic** - Reaction in which energy is taken in.
- **Exothermic** - Reaction in which energy is given out.
- **Reactive** - The tendency of a substance to undergo a chemical reaction.
- **Reactivity series** - A list of elements in order of their reactivity.
- **Rusting** - A corrosion process in which iron or steel reacts with oxygen and water.
  Thermal decomposition - Type of reaction in which a compound breaks down when heated.
- **Unreactive** - A substance that does not easily take part in chemical reactions

2. Methods and results tables

- During practical investigations, we always aim to use as wide a range as possible and equally spread.
- We repeat measurements at least three times to increase reliability.
- We calculate the mean of the repeats but adding the values together and dividing by the number of values.
- Results are presented in tables.
- The first column is always the **independent variable** (the thing we deliberately changed).
- The final column is always the **dependent variable** (the outcome that we were measuring).
- Units always go in the table headings, **never** in the body of the table.

3. Reactivity series

This is a list of a small selection of metals given in order of their **reactivity** from **most reactive** (potassium) to **least reactive** (gold):

potassium, sodium, calcium, magnesium, aluminium, zinc, iron, tin, lead, copper, silver, gold.

Displacement reactions

- Displacement reactions involve a metal and a compound of a different metal.
- A more reactive metal will always displace a less reactive metal from its compounds, for example:
  aluminium + iron oxide → iron + aluminium oxide
- Here, aluminium is more reactive than iron and displaces iron (takes its place) from the compound.

4. Reactions with acids

Metals and acids

- Acid + metal → salt + hydrogen
- For example:

hydrochloric acid + iron → iron chloride + hydrogen

- Hydro**chloric** acid always forms **chlorides**
- **Sulphuric** acid always forms **sulphates**
- **Nitric** acid always forms **nitrates**.

Acids and carbonates

- Acid + metal carbonate → salt + water + carbon dioxide
- For example:

sulphuric acid + iron carbonate → iron sulphate + water + carbon dioxide.

5. Other reactions

Metals and oxygen

- Metals in air may react with oxygen, for example:
  sodium + oxygen → sodium oxide
- **Oxidation** is the **loss** of **electrons**. It is also the **gain** of **oxygen** by a substance.

Thermal decomposition

- When a compound breaks down into two or more products when heated.
- For example, when copper carbonate is heated:
  copper carbonate → copper oxide + carbon dioxide
- Thermal decomposition is an example of an **endothermic** reaction where energy is taken in from the surroundings.

6. Command Words

These are the key words in a question that tell you how the question should be answered.

State – requires you to recall a key fact without any further information needed.

Example:
State what type of salt sulphuric acid forms.
Answer: Sulphuric acid forms sulphates.

Describe – say what will happen, but <u>without</u> any reason why.

Example:
Describe what happens in a displacement reaction.
Answer: In a displacement reaction, a more reactive metal takes the place of a less reactive metal.

Explain – give the reasons for something happening.

Example:
Explain what type of reaction thermal decomposition is.
Answer: Thermal decomposition is an endothermic reaction *because* it takes in energy.