Lesson: 2

Equipment:

For each group:

_ test tubes, bungs, thermometer and rack

_ 0.4 mol/dm3 hydrochloric, sulphuric and nitric acid

_ small pieces of magnesium, zinc and copper

_ splints and access to a lighted Bunsen

Safety:

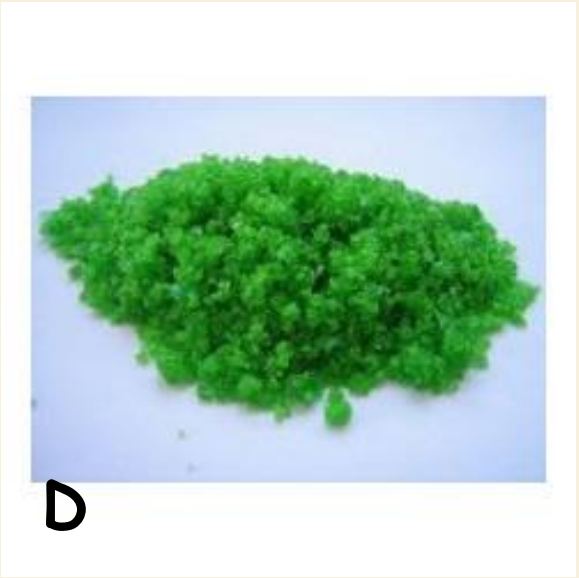
Eye protection should be worn and pupils reminded of safe acid handling.

Metal and Acid

Time:

Noise Level quiet

Which is the salt?



Salts are formed from the reactions of metals and metal compounds with acids.

Depending on what acid is used depends on the name of the salt formed.

AMCAN

Associate the salt name with acid being used.

Learning Outcomes

Challenging: **name** the gas produced in the reaction, and describe the test.

More Challenging: **make the link between** the name of the salt and the acid used.

Most Challenging: write the word equations for the reactions.

Task 1

How can you tell a reaction is taking place between the calcium and the acid?

Task 2

REMEMBER: WEAR SAFETY GOGGLES!

1. Fill test tube ¼ full with acid
2. Add a piece of magnesium
3. Place on the bung
4. Allow the gas to build up
5. Test gas with lit splint
6. Record results into table
7. Pour waste into waste container
8. Repeat for a different acid

Task 2

Metal + Acid ⟶ Salt + Hydrogen

Hydrogen Test:

Place a **lighted splint** next to the mouth of test tube.

A **‘squeaky pop’** as the gas ignites shows that **hydrogen** is the gas produced in this reaction.

The name of a salt is derived from the metal and acid used in a reaction. The different acids form different salts.

Acid	**Name of salt end**
Hydrochloric (HCl)	Chloride (Cl)
Sulfuric (H_2SO_4)	Sulfate (SO_4)
Nitric (HNO_3)	Nitrate (NO_3)

Task 3

Calcium + Hydrochloric acid $\longrightarrow$ Calcium Chloride + Hydrogen

$Ca + 2HCl \longrightarrow CaCl_2 + H_2$

Task 3

Use the cards to match up some word equations

Task 3

Complete the word equations for metals reacting with acid:

magnesium + nitric acid → ? + hydrogen

iron + sulfuric acid → ? + hydrogen

zinc + hydrochloric acid → ? + hydrogen

? + ? → lead sulfate + hydrogen

Task 3

Complete the equations on your worksheet

Magnesium + Hydrochloric acid → _____ _____ + _____

Magnesium + _____ _____ → _____ sulphate +Hydrogen

Plenary

Time:

Noise Level

Get your whiteboards ready!

Plenary

Time:

Noise Level

1. What gas is made when an acid reacts with a metal?

A Hydrogen

B Oxygen

C carbon dioxide

Plenary

Time:

Noise Level

2. What are the products when an acid reacts with a metal?

A Salt + Nitrogen

B Salt + Carbon dioxide

C Salt + Hydrogen

Plenary

Time:

Noise Level

3. What happens to the temperature of the reaction when the metal to the acid?

A stays the same

B increases

C decreases

Plenary

Time:

Noise Level

4. How do you test for Hydrogen gas?

A bubble into limewater, turns cloudy

B lit splint get a squeaky pop

C glowing splint, relights

Plenary

Time:

Noise Level

5. Magnesium + Hydrochloric acid produces?

A Magnesium sulphate + Hydrogen

B Magnesium chloride + Hydrogen

C Magnesium nitrate + Hydrogen

Plenary

Time:

Noise Level

6. What reacted to produce iron sulphate + hydrogen?

A iron oxide + sulphuric acid

B iron carbonate + sulphuric acid

C iron + sulphuric acid

Plenary

Time:

Noise Level

7. What salt is formed from the reaction of calcium and nitric acid?

A Calcium nitrate

B Calcium chloride

C Calcium nitric

Plenary

Time:

Noise Level

8. Which of these metals reacts the most vigorously with acid?

A Calcium

B Magnesium

C Iron