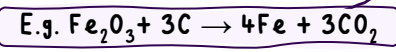


# 4.1 REACTIVITY OF METALS



Reduction involves loss of oxygen

Reduction of oxides using carbon



Metals less reactive than carbon can be extracted from their oxides by reduction with carbon

Metals more reactive than carbon have to be extracted by electrolysis

Unreactive metals are found as themselves

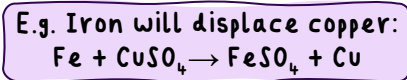
E.g. Gold

Often the oxides are the ores which the metals are extracted from

Metals react with oxygen to form metal oxides

Oxidation reaction – gain of oxygen

**Extracting metals**



A more reactive metal can displace a less reactive metal

Carbon and hydrogen also included

Metals arranged in order of reactivity

**The reactivity series**

Reactivity is the tendency to form positive ions

Can be used to determine the reactivity series

Relative reactions of metals with...

Dilute acids

Water

Copper will not easily react with dilute acids

Produce a salt and hydrogen gas

Magnesium, zinc and iron will react less violently with acids

Potassium, sodium, lithium and calcium react violently with acids

Produce a metal hydroxide and hydrogen gas

Potassium, sodium, lithium and calcium all react with water

Zinc, iron and copper will not react with water

Reduction is the gain of electrons

Oxidation is the loss of electrons

**Oxidation and reduction**

Use OIL RIG to remember:  
Oxidation Is Loss  
Reduction Is Gain

Identify which species are oxidised or reduced

Ionic equations for displacement reactions

**KEY**  
'Higher only' written in yellow.

**AQA**