

C4.1.6 Reactivity of Elements  
(Chemistry)

C4.1.5 Reactivity of Elements  
(Combined Science)

# Learning Objectives

- Explain the reactivity of different metals
- Use experimental data to determine relative reactivities of metals
- Predict the reactivity of an element from its position in the periodic table

# Patterns of reactivity in the periodic table

- Group 0 elements do not react
- Group 1 and 2 metals get more reactive as you go down the group
- Group 7 elements get less reactive as you go down the group
- Non-metals that react together will make a **covalent** compound
- If a metal reacts with a non-metal an **ionic** compound will be made
- Metals in groups 1 and 2 are more reactive than the transition metals

# Reactions of metals

Metal + water  $\rightarrow$  metal hydroxide + hydrogen

Metal + acid  $\rightarrow$  metal salt + hydrogen

# Using results from experiments to determine relative reactivity

Metal	Observations		Order of reactivity
	With water	With acid	
Zn	No reaction	Bubbles	5
K	Lilac flame	Not safe to do in a classroom	1
Cu	No reaction	No reaction	7
Ca	bubbles	Not safe to do in a classroom	3
Na	Fizzing, melted	Not safe to do in a classroom	2
Fe	No reaction	A few bubbles	6
Mg	A few bubbles after 2 minutes	Lots of bubbles	4

# Using results from experiments to determine relative reactivity

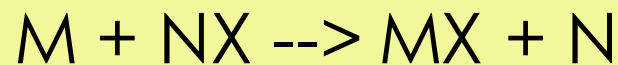
Metal	Observations		Order of reactivity
	With water	With acid	
Zn	No reaction	Bubbles	5
K	Lilac flame	Not safe to do in a classroom	1 (most)
Cu	No reaction	No reaction	7 (least)
Ca	bubbles	Not safe to do in a classroom	3
Na	Fizzing, melted	Not safe to do in a classroom	2
Fe	No reaction	A few bubbles	6
Mg	A few bubbles after 2 minutes	Lots of bubbles	4

# Displacement reactions of metals

We saw in C4.1.3 that a more reactive halogen could displace a less reactive halogen from a compound

This is also true for metals

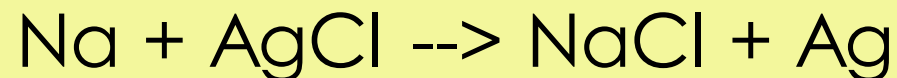
A more reactive metal can displace a less reactive metal from a compound



If M and N are metals and X is a non metal  
The reaction will occur if M is more reactive than N

# Displacement reactions of metals

## Examples



This reaction would work as sodium is more reactive than silver



There would be no reaction as copper is less reactive than potassium