9 Metals and alloys – Part 1

Name: _____ Class: _____ Date: _____

Vocabulary

Write each word three times.

English	Write it 3 times (English)		
Metals			
non-metals			
alloy			
malleable			
ductile			
brittle			
mixture			
brass			
steel			
layers			
reactivity series			

Recall

Metals behave very differently from **non-metals** , and we can order them by how reactive they are.

- Metals conduct heat and electricity and can be shaped.
- An **alloy** is a metal mixed with other elements.

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Nothing here is hard – it just organises the properties.

New ideas

Read these first, then do the Practice.

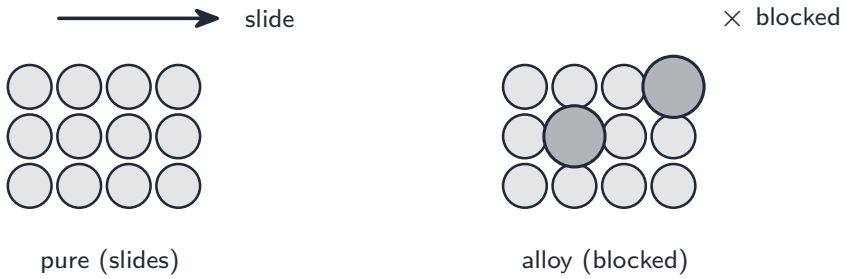
■ 1 Metals vs non-metals

Property	Metals	Non-metals
conducting heat and electricity	good	poor
malleable / **ductile**	yes	**brittle** (snap)
melting point	usually high	usually low

■ 2 Alloys

An **alloy** is a **mixture** of a metal with other elements (e.g. **brass** = copper + zinc; **steel** = iron + carbon).

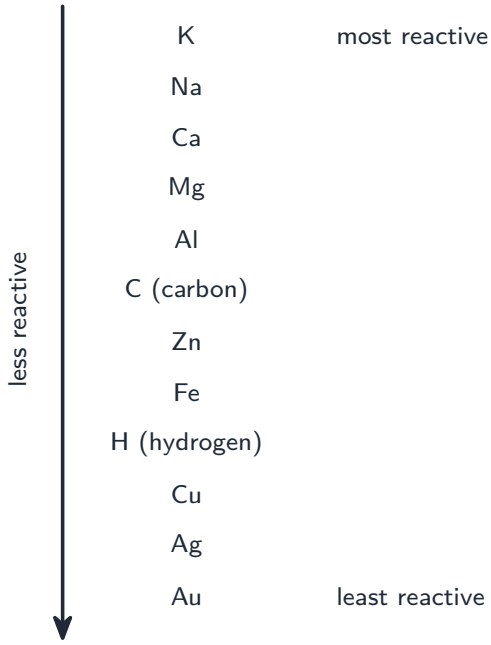
Alloys are **harder** than pure metals: in a pure metal the same-size atoms let the **layers** slide, but in an alloy the different-sized atoms **block** the sliding.



■ 3 The reactivity series

The **reactivity series** lists metals from most to least reactive (carbon and hydrogen are included for comparison):

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A more reactive metal **displaces** a less reactive one from a solution of its ions.

Watch out: an alloy is **harder** than the pure metal because its different-sized atoms **block the layers from sliding** – pure metals are softer, not harder. A more reactive metal **displaces** a less reactive one from a solution of its ions.

Practice

Try these in order.

9.1 State two physical properties of metals. [2]

9.2 What is an *alloy*? Give one example. [2]

9.3 Explain why an alloy is harder than the pure metal. [2]

9.4 In the reactivity series, which is more reactive – magnesium or copper? [1]

9.5 Zinc is more reactive than copper. What will zinc do to copper(II) sulfate solution? [1]

9.6 Challenge. Iron is more reactive than copper but less reactive than magnesium. Predict what happens when (a) magnesium is added to iron(II) sulfate solution, (b) copper is added to iron(II) sulfate solution. [2]