9 Rusting and extraction – Part 2

Name: _____ Class: _____ Date: _____

Vocabulary

Write each word three times.

English	**Write it 3 times** (English)		
reactivity series			
rusts			
extract			
ores			
Rusting			
oxygen			
barrier methods			
galvanising			
sacrificial protection			
blast furnace			
electrolysis			

Recall

From Part 1 you know the **reactivity series** . It explains why iron **rusts** and how we **extract** metals from their **ores** .

- Rusting is the corrosion of iron.
- A metal's place in the series decides how it is extracted.

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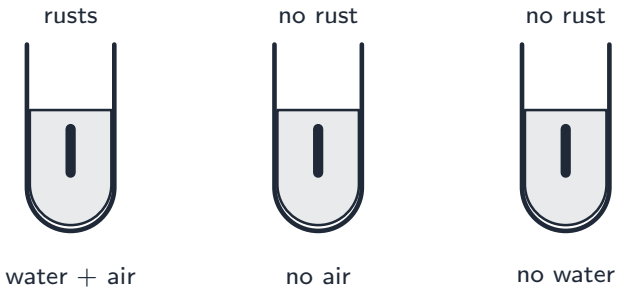
Nothing here is hard – it just applies the order.

New ideas

Read these first, then do the Practice.

1 Rusting

Rusting is the corrosion of iron. It needs **two** things: **oxygen** (from the air) **and** water.



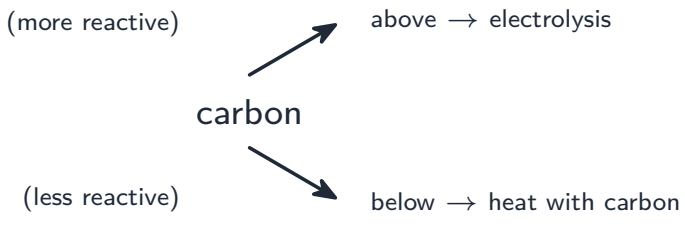
Stopping rust:

- **barrier methods** – paint, oil/grease or plastic keep out air and water.
- **galvanising** – coat with **zinc**; the zinc also gives **sacrificial protection** (being more reactive, it corrodes instead of the iron).

2 Extracting metals

How a metal is taken from its ore depends on its reactivity:

- metals **below carbon** in the series → heat the ore **with carbon** (carbon removes the oxygen). Iron is made this way in a **blast furnace**.
- metals **above carbon** are too reactive → extracted by **electrolysis**. Aluminium is made this way.



Watch out: rusting needs **both** oxygen **and** water – remove either and iron will not rust. A metal **below** carbon is extracted by heating its ore *with carbon*; one **above** carbon is too reactive and needs **electrolysis**.

Practice

Try these in order.

9.1 What two substances are needed for iron to rust? [2]

9.2 Name the rust formed (its chemical name). [1]

9.3 Galvanising protects iron in two ways. State them. [2]

9.4 Why does the more reactive zinc protect the iron, even if the surface is scratched? [2]

9.5 How is (a) iron, (b) aluminium extracted from its ore? [2]

9.6 Challenge. Aluminium is above carbon in the reactivity series, but iron is below it. Explain why aluminium must be extracted by electrolysis while iron can be extracted with carbon. [3]