

Reactivity

Lesson 20 - Review 2

Science - Key Stage 3

Miss Fenner





Make flash cards for the key definitions I am about to bring up on the screen.



Key Definitions 1

- **Reactivity series** - a list of metals ranked from most to least reactive.
- **Vigorous reaction** - one which is carried out forcefully, energetically and quickly.
- **Ore** - a naturally occurring rock that contains enough metal to make it worthwhile to extract it.
- **Displacement** - a reaction in which a more reactive metal takes the place of a less reactive metal in its compound.
- **Reduction** - a reaction in which a substance loses oxygen atoms.
- **Pure metal** - a material made of atoms from just one type of metal.



Key Definitions 2

- **Alloy** - an alloy is a mixture of elements, including at least one metal.
- **Conductor** - a substance that contains free electrons which can carry heat/ electrical charge.
- **Malleable** - can be bent and pressed into shape.
- **Ductile** - can be drawn into a wire.
- **Sonorous** - makes a ringing sound when hit.



Match the reactants to the products they will produce.

Sodium + calcium oxide →

No reaction

Iron + sodium chloride →

Calcium oxide + silver

Calcium + silver oxide →

No reaction

Silver + calcium oxide →

Sodium chloride + iron

Sodium + iron chloride →

Sodium oxide + calcium



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Sodium + iron chloride →

Sodium oxide + calcium



Word bank:

Heating Metal ores Carbon Less
Metal Reduced Pure metals

Metals that are unreactive are found in the Earth as _____ .

Metals that are reactive are found in the Earth as _____ .

If a metal is _____ reactive than carbon then it CAN be extracted from its ore by _____ it with carbon.

If a metal is _____ reactive than carbon then it CANNOT be extracted from its ore using carbon.

Metal oxide + _____ → _____ + carbon dioxide

The metal oxide has been _____ .



Word bank:

Heating

Metal ores

Carbon

Less

Metal

Reduced

Pure metals

Metals that are unreactive are found in the Earth as **pure metals**.

Metals that are reactive are found in the Earth as **metal ores**.

If a metal is **less** reactive than carbon then it CAN be extracted from its ore by **heating** it with carbon.

If a metal is **more** reactive than carbon then it CANNOT be extracted from its ore using carbon.

Metal oxide + **carbon** → **metal** + carbon dioxide

The metal oxide has been **reduced**.



A property of pure metals is that they are malleable.

1. Draw a diagram of the atoms in a pure metal
2. Describe how its structure means it is malleable.
3. Draw a diagram of the atoms in an iron and carbon alloy.
4. Describe how its structure means it is less malleable but stronger.

Key words:

Atoms

Layers

Slide

Malleable

Disrupt

Stronger



Self-assess

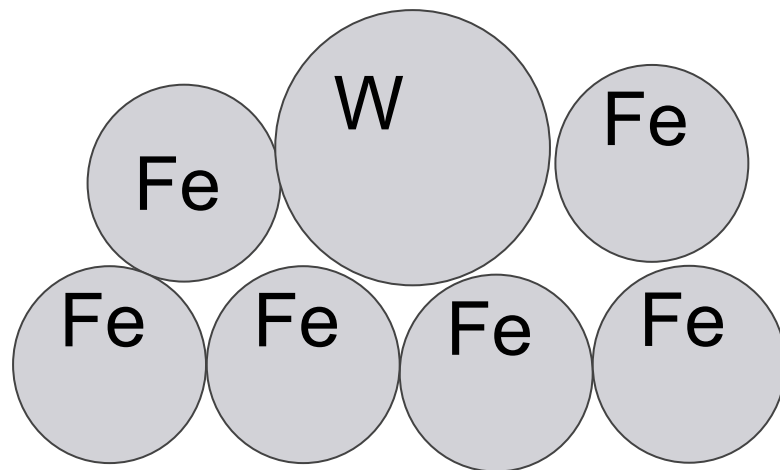
1.



Source: Miss Fenner

2. The metal **atoms** are arranged in **layers** meaning the layers can easily **slide** over each other. This makes pure metals **malleable**.

3.



Source: Miss Fenner

4. The carbon **atoms** in the alloy **disrupt** the **layers** of iron atoms. This makes it more difficult for the layers to **slide** over each other. This makes the alloy **stronger** and less **malleable**.



Sodium is more reactive than copper

TRUE

FALSE



Adding carbon into an alloy can
add strength

TRUE

FALSE



A less reactive metal can displace
a more reactive metal

TRUE

FALSE



Ores usually contain metal carbonates

TRUE

FALSE



A vigorous reaction will often produce lots of bubbles

TRUE

FALSE



Reactive metals are usually found in the Earth as pure metals.

TRUE

FALSE



Quick Quiz - Check your knowledge

1. Give one observation seen when potassium reacts with water.
2. State 2 observations that may be seen when a vigorous reaction takes place.
3. What information does the reactivity series give us?
4. What are 3 factors to consider when deciding if a metal is worthwhile extracting from an ore?
5. Write an equation for the displacement reaction between sodium and copper oxide.
6. Explain why no reaction will take place between copper and sodium oxide.
7. Explain why metals are good conductors of heat and electricity.



Quick Quiz - Check your knowledge

1. When potassium reacts with water there is fizzing/bubbles and the potassium burns with a lilac flame.
2. 2 observations that may be seen when a vigorous reaction takes place are lots of bubbles produced, a rapid colour change, a rapid temperature change and a reaction that ends quickly.
3. The reactivity series tells us how reactive metals are compared to other metals.
4. 3 factors to consider when deciding if a metal is worthwhile extracting from an ore are time, effort and money.
5. Sodium + copper oxide → Copper + Sodium oxide
6. No reaction will take place between copper and sodium oxide because copper is less reactive than sodium so cannot displace sodium from its compound.
7. Metals are good conductors of heat and electricity because they contain free electrons that can travel through the metal and carry heat/ an electrical charge.



Write a paragraph to compare the metals silver and iron.

Success criteria

- What properties do they have in common?
- How reactive are they?
- How are they found in the Earth? Explain how you know this.
- Complete and explain the following equations:
 - Iron + silver oxide →
 - Silver + Iron oxide →



Self-assess

Mark scheme

- Both are metals.
- Both have properties in common e.g. silver, hard, solid at room temperature, malleable, ductile, good conductors and sonorous.
- Iron is more reactive than silver.
- Iron is found higher up the reactivity series than silver.
- Iron is reactive so is found in the Earth as an ore. Silver is unreactive so is found in the Earth as a pure metal.
- Iron + silver oxide → Iron oxide + silver
- This is because iron is more reactive than silver so can displace silver from its compound.
- Silver + Iron oxide → no reaction
- This is because silver is less reactive than iron so is unable to displace iron from its compound.

