



Section A:

1. Complete this sentence. The reactivity series is a list of...

2. Using the reactivity series, state all the metals that are **more** reactive than carbon.

3. Write the correct words in the gaps to complete the sentences.

- Oxidation involves reacting with _____ to form an oxide.
- An oxidising agent causes the _____ of a substance.
- Reduction of a compound involves the loss of _____.
- A reducing agent causes the _____ of a substance.

4. This question is about a displacement reaction.

(a) Complete the displacement reaction below.

Zinc oxide + carbon \rightarrow _____ + _____

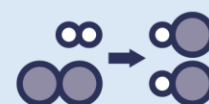
(b) Complete the balanced symbol equation below.



(c) Define 'displacement reaction'.

(d) Explain why carbon displaces zinc in this reaction.

(e) State what has been reduced in this reaction. Explain your answer.





Section B

1. Choose which metal is found as pure metal in the Earth,
(a) Tick (✓) **one** box.

Sodium ☐Platinum ☐Zinc ☐

(b) Explain your answer to (a).

2. Rocks can contain metal ores.

(a) Define 'ore'.

(b) Explain why aluminium and magnesium are always found as ores in the Earth and not as pure metals.

3. Using the reactivity series, complete the word equations below.

If there is no reaction, write 'NO REACTION' and explain why.

(a) Aluminium oxide + carbon → _____

(b) Silver oxide + carbon → _____

(c) Carbon + magnesium oxide → _____

(d) Iron oxide + carbon → _____

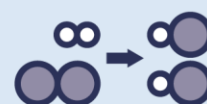
(e) Carbon + sodium oxide → _____

(f) Carbon + lead oxide → _____

(g) Calcium oxide + calcium → _____

4. Complete the table below to state what is being reduced and what is being oxidised in each reaction.

Displacement reaction	What is reduced?	What is oxidised?
Copper oxide + carbon →		
Lead oxide + carbon →		
Zinc oxide + carbon →		





Section C

Galena, shown in the image, is a mineral ore that contains lead sulphide. Galena is the main ore of lead and has been mined for centuries.



Image source: https://commons.wikimedia.org/wiki/File:Galena,_sphalerite.jpg

1. Write the compound formula for lead sulphide.

2. Calculate the relative formula mass of lead sulphide.

3. Calculate the percentage by mass of lead in lead sulphide.
Give your answer to 1 decimal place.

4. Is lead sulphide an ionic or covalent compound? Explain your answer.

5. Below shows a two-step method for extracting lead from lead sulphide.

Reaction 1 Lead sulphide + oxygen \rightarrow lead oxide + sulphur dioxide

Reaction 2 Lead oxide + carbon \rightarrow lead + carbon dioxide

- (a) Write out the balanced symbol equations for reaction 1 and reaction 2.

Reaction 1 _____

Reaction 2 _____

- (b) State which reaction shows the **oxidation** of lead. Reaction ____ .

- (c) State which reaction shows the **reduction** of lead. Reaction ____ .

- (d) Copper was used instead of carbon in reaction 2. Explain why there was no reaction.

