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 → _____ + _____

   (b) Complete the balanced symbol equation below.

   ZnO + C → _____ **+** _____

   (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 →		

Science Mastery

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 → lead oxide + sulphur dioxide
Reaction 2	Lead oxide + carbon → 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.

_____

_____

_____