

Stage 4 Science: Periodic Table and Atomic Structure

Homework Sheet 1

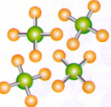
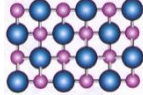
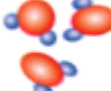

Multiple Choice

1. Four elements were tested, and the results are shown below.

Element	Solid at room temp	Can be beaten into sheets	Conducts electricity	Conducts heat
W	Yes	Yes	Yes	Yes
X	No	No	Yes	Yes
Y	Yes	No	Yes	No
Z	No	Yes	No	Yes

Which two elements are most likely metals?

- (a) W, X
 - (b) X, Z
 - (c) W, Z
 - (d) Y, W
2. Which of these is not a characteristic of metals?
- (a) Usually, hard solids at room temperature
 - (b) Have a lustre when cut or scratched.
 - (c) Usually, poor conductors of heat and electricity
 - (d) Can be bent, stretched, or flattened.
3. Which of the following is not an element?
- (a) Aluminium
 - (b) Carbon monoxide
 - (c) Mercury
 - (d) Copper
4. Which of the following structures is a lattice?

(a)	
(b)	
(c)	
(d)	

Fundamental Questions

1. Define the term element (1 mark)

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2. State the properties of each group of elements (7 marks):

Properties	Metals	Non-Metals
Physical state (at room temperature)		
Appearance		
Melting point		
Density		
Malleability		
Ductility		
Conductivity of electricity and heat		

3. Complete the table by stating whether the elements are examples of metals or non-metals (5 marks).

Carbon	
Gold	
Oxygen	
Mercury	
Potassium	

4. Distinguish between physical and chemical properties and provide TWO examples of each (3 marks)

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5. Classify the following statements as true or false (4 marks).

- a) Each element has its own unique set of chemical properties.
- b) Melting point is a chemical property.
- c) Ductility is a chemical property.
- d) Flammability is a chemical property.

6.

a) Identify two metals and state their uses (2 marks)

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b) Identify two non-metals and state their uses (2 marks)

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7. Define the term compound (1 mark)

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8. Only two elements are liquids at room temperature – bromine and mercury. Bromine is a non-metal and mercury are a metal. Predict how these two liquids are likely to appear. (1 mark)

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9. Carbon exists as either graphite, diamond, or amorphous carbon.

a) Define allotrope (1 mark)

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b) Explain how the arrangement of the carbon atoms can result in different properties in graphite and diamond (2 marks)

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Extension Questions

1. Complete the table below for the evolution of the models for atomic structure (5 marks)

Model	Contribution to atomic structure
Solid Ball Model (Dalton – 1803)	
Plum Pudding Model (Thomson – 1904)	
Planetary Model (Rutherford - 1911)	
Planetary Model with electron shells (Bohr – 1913)	
Chadwick-Bohr Model (Chadwick – 1932)	

2. When constructing a device such as a car, engineers are very careful to choose materials that have the right properties for the job they need to do. For each part of the car labelled below, list the physical or chemical properties that would have led to these materials being chosen for their role (7 marks).

