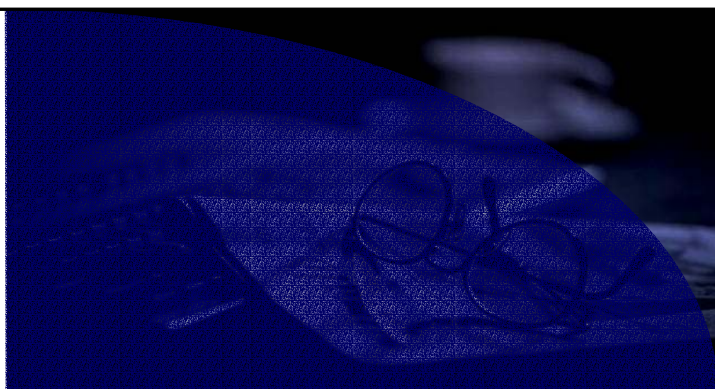


assessment for learning

year 8



Science Interactive LTD. PO BOX 50764 LONDON NW6 9AT

web: [www.science-interactive.co.uk](http://www.science-interactive.co.uk)

## 8E Atoms and elements

### Assessment for learning...year 8 (level 3-6)

Answer all questions:

Total marks	28
Time allowed	25 mins.

#### Question 1:

A reactivity series of elements is shown below.

sodium

calcium

magnesium

aluminium

carbon

zinc

iron

tin

lead

copper

The method of obtaining a metal from its oxide depends on the reactivity of the metal.

(a) What is the method of obtaining zinc, iron, tin and lead?

.....  
.....

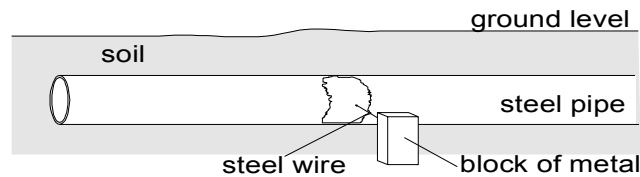
1 mark

(b) When sodium is obtained, great care is taken to prevent air coming into contact with sodium. Give a reason for this.

.....  
.....

1 mark

(c) The diagram below shows a steel pipe which has been repaired. At the point of repair, another metal has been attached by a steel wire. This metal is more reactive than iron, from which steel is made. The block of metal corrodes instead of the steel of the pipe.



(i) Name a metal from the reactivity series above which is suitable for this purpose.

.....

1 mark

(ii) Name a metal from the reactivity series above which is **unsuitable** for this purpose and explain why it is unsuitable.

Name of metal .....

It is unsuitable because .....

.....

1 mark

(d) Jam is made from fruit which contains natural acids.

(i) Aluminium is high in the reactivity series. Suggest why aluminium saucepans should not be used for making jam.

.....

.....

1 mark

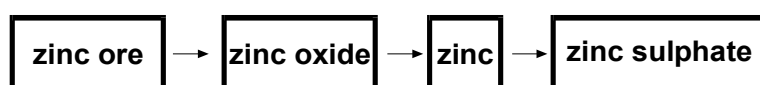
(ii) Tin-plated steel is used for jam-making pans. Suggest why the steel is tin plated.

.....  
.....

1 mark  
Maximum 6 marks

**Question 2:**

The flow chart shows how zinc sulphate can be obtained.



(a) In the reaction **zinc oxide** → **zinc** an element is removed from zinc oxide to leave zinc. Give the name of the element.

.....

1 mark

(b) (i) Zinc sulphate can be made in a reaction between zinc and an acid. Give the name of the acid.

.....

1 mark

(ii) In the reaction between zinc and the acid, hydrogen is formed. Describe the test for hydrogen and the result if hydrogen is present.

.....  
.....

1 mark

(iii) How can crystals of zinc sulphate be formed from a dilute solution of zinc sulphate?

.....

1 mark

Maximum 4 marks

**Question 3:**

Air is a gas at room temperature. The chemical formulae below show some of the substances in the air.



(a) Put these formulae in the correct columns in table A to show which substances are elements and which are compounds.

**table A**

element	compound

1 mark

(b) Put the formulae in the correct columns in table B to show whether the formula of each substance represents an atom or a molecule.

**table B**

atom	molecule

1 mark

(c) The coldest possible temperature is 'absolute zero', which is  $-273^{\circ}\text{C}$ . As air is cooled towards absolute zero it liquefies. Table C gives the boiling points of the substances in air.

**table C**

<b>formula</b>	<b>boiling point in °C</b>
Ar	-186
CO <sub>2</sub>	-78
H <sub>2</sub> O	100
N <sub>2</sub>	-196
Ne	-246
O <sub>2</sub>	-183

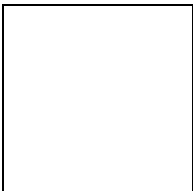
A sample of air at a temperature close to absolute zero is allowed to warm up.  
Which substance boils first?

.....

1 mark

(d) Each particle of neon can be represented by a circle.

Carefully complete the diagrams below to show the arrangement of particles in neon gas and liquid neon.

Use circles about  in size.

**neon gas, Ne**



**liquid neon, Ne**



4 marks

Maximum 7 marks

**Question 4:**

Gold, iron and magnesium are elements which conduct electricity.

Sulphur and phosphorus are elements which do **not** conduct electricity.

When iron and sulphur are heated together, they react to form a new substance called iron sulphide.

(a) From the substances named above, give:

(i) the name of a metal;

.....

1 mark

(ii) the name of an element which is a non-metal;

.....

1 mark

(iii) the name of an element which will rust;

.....

1 mark

(iv) the name of a compound.

.....

1 mark

(b) When magnesium and sulphur are heated together, they react. Write the name of the compound which is formed when magnesium reacts with sulphur.

.....

1 mark

Maximum 5 marks

**Question 5:**

(a) The table below shows the melting points of four metals.

metal	melting point, in °C
gold	1064
mercury	-37
sodium	98
iron	1540

(i) Which metal in the table has the highest melting point?

.....

1 mark

(ii) Which metal in the table has the lowest melting point?

.....

1 mark

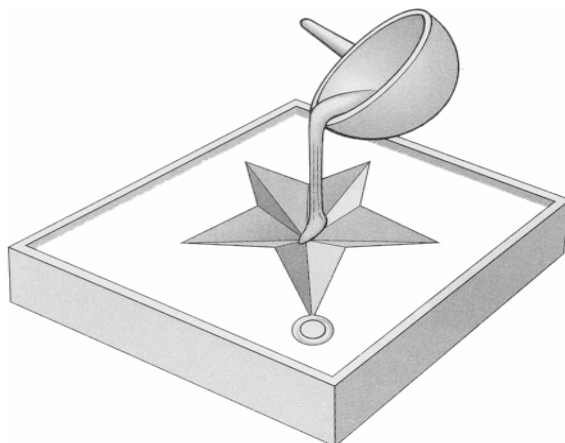
(b) Gold can be a **gas** or a **liquid** or a **solid**.

Choose from these words to fill the gaps below.

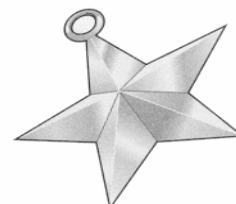
When gold is heated from room temperature to 1070°C, the gold changes from a ..... to a .....

1 mark

(c) ,5 g of gold is melted and **all** of it is poured into a mould to make a pendant as shown below.



melted gold is poured into a mould



gold pendant

What is the mass of the gold pendant?

..... g

1 mark

(d) The table below shows how the four metals react with oxygen when heated in air.

metal	reaction when heated in air
gold	no change
mercury	slowly forms a red powder
sodium	bursts into flames straight away
iron	very slowly turns black

(i) Which is the **most** reactive metal in the table?

.....

1 mark

(ii) Which is the **least** reactive metal in the table?

.....

1 mark

Maximum 6 marks