METALS AND THEIR ORES

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Learning Outcomes:

At the end of this lesson, you will be able to:-

(i) list the different metals and their ores

(ii) match the metals with their uses

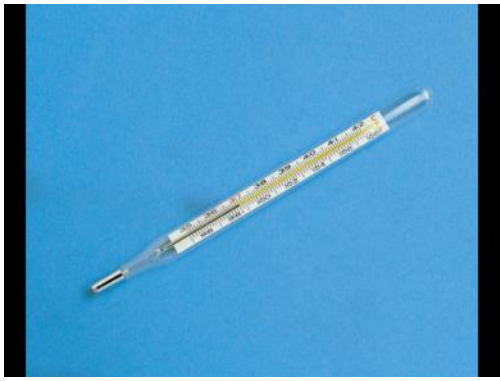
(iii) predict the method of extraction of different metals

(iv) describe the importance of recycling metals

Let us check your prior knowledge.
Match the following metals with their appearance

Mercury

Silver



Gold

Aluminium

Silver

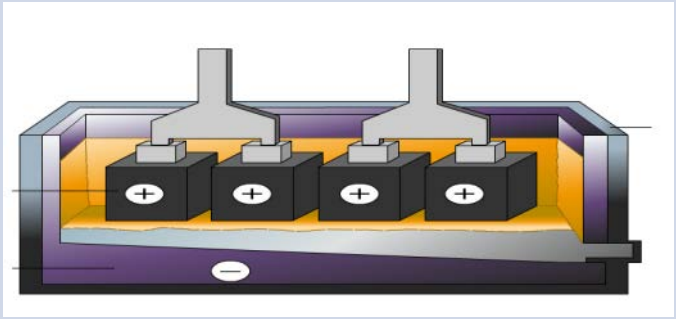
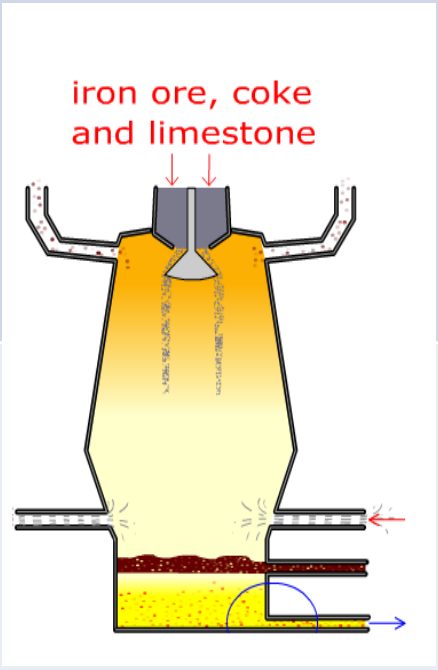
Score
0

METALS AND THEIR ORES

In some places, the mineral deposits in rock contain a high concentration of one metal. These metal deposits are called **ores**.

An ore is a mineral deposit that can be mined and refined at profit.

HOW METALS ARE EXTRACTED?

METAL	ORE	METHOD OF EXTRACTION
ALUMINIUM	BAUXITE	ELECTROLYSIS 
IRON	HAEMATITE	BLAST FURNACE 
COPPER	MALACHITE	ROASTING IN AIR

Which metal is extracted from the metal ore shown below ?

1. Sodium
2. Aluminium
3. Copper
4. Silver

EXTRACTION OF COPPER FROM MALACHITE

Why produce copper? It's hard to imagine a world without copper. We rely on copper for power, lighting, heating, communications, water supply and transport. Copper makes our homes, schools and businesses efficient, comfortable and decorative and it lasts for many years. Every year, the world demand for copper is about 15 million tonnes.

The main ores of copper are:

- Chalcopyrite
- Bornite
- Malachite

Over 50% of the World's copper comes from chalcopyrite and bornite.

BRAIN TEASER

Choose the ore of Aluminium(Bauxite), Zinc(Sphalerite), Iron(Haematite), Gold nuggets in yellow

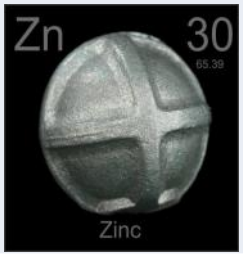
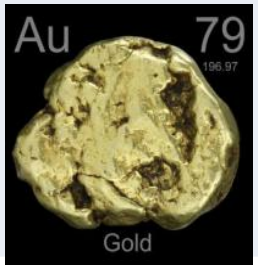
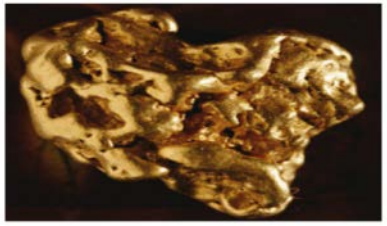
Gold Nuggets

Gold Nuggets

Haematite

Bauxite

Let us discover the answers

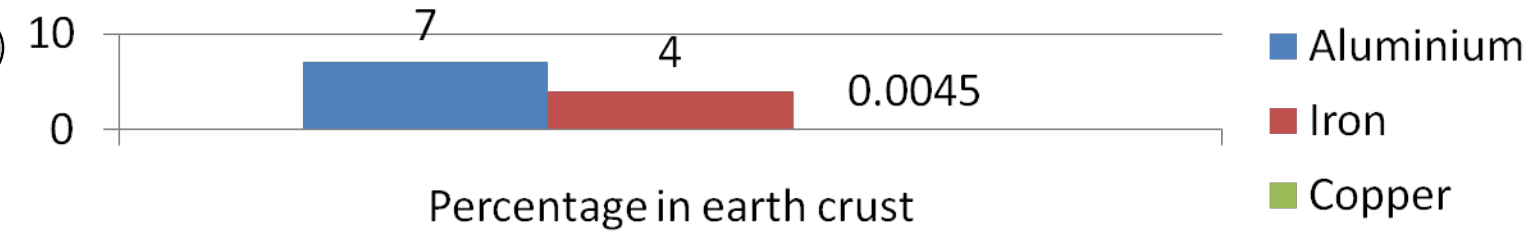
METAL		ORE	
Aluminium		Bauxite	
Zinc		Sphalerite	
Iron		Haematite	
Gold		Gold nuggets	

DISCOVERY OF METALS

Metal	Percentage of Earth's crust	Date discovered
aluminium	7	170 years ago
iron	4	3000 years ago
sodium	2.5	90 years ago
magnesium	2	130 years ago
zinc	0.007	2000 years ago
copper	0.0045	7000 years ago
lead	0.0015	6500 years ago
tin	0.0002	6000 years ago
gold	0.000 000 5	10 000 years ago

Which of the following barchart on the abundance of metals in the Earth crust is TRUE?

1



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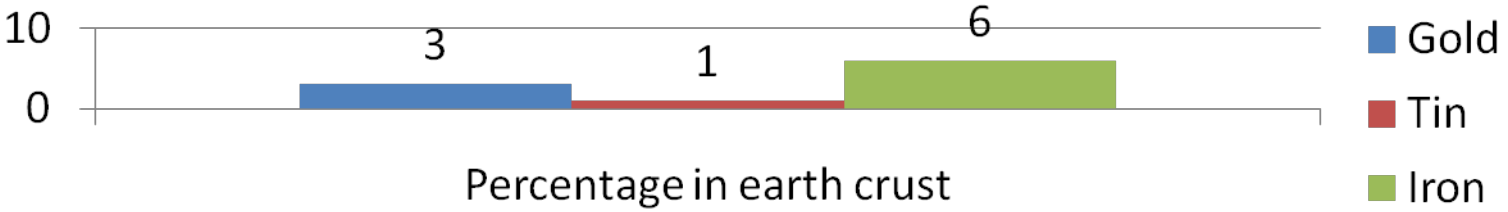

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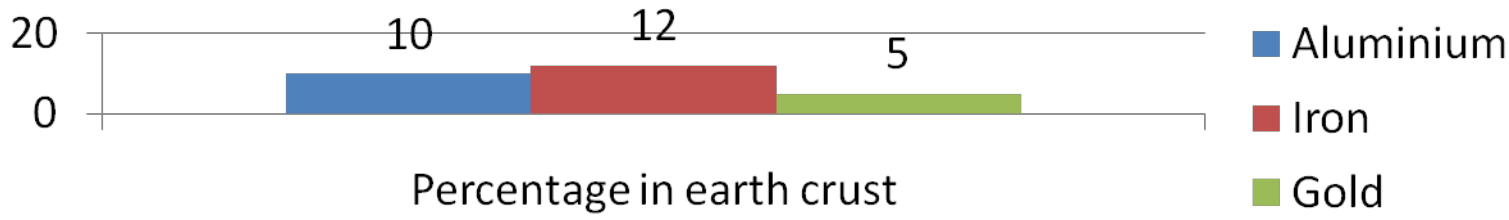


Which of the following list of metals shows the correct trend in price (*most expensive first)?*

1 ○ Gold, Iron, Aluminum

2 ○ Aluminium, Iron, Gold

3 ○ Gold, Aluminium, Iron

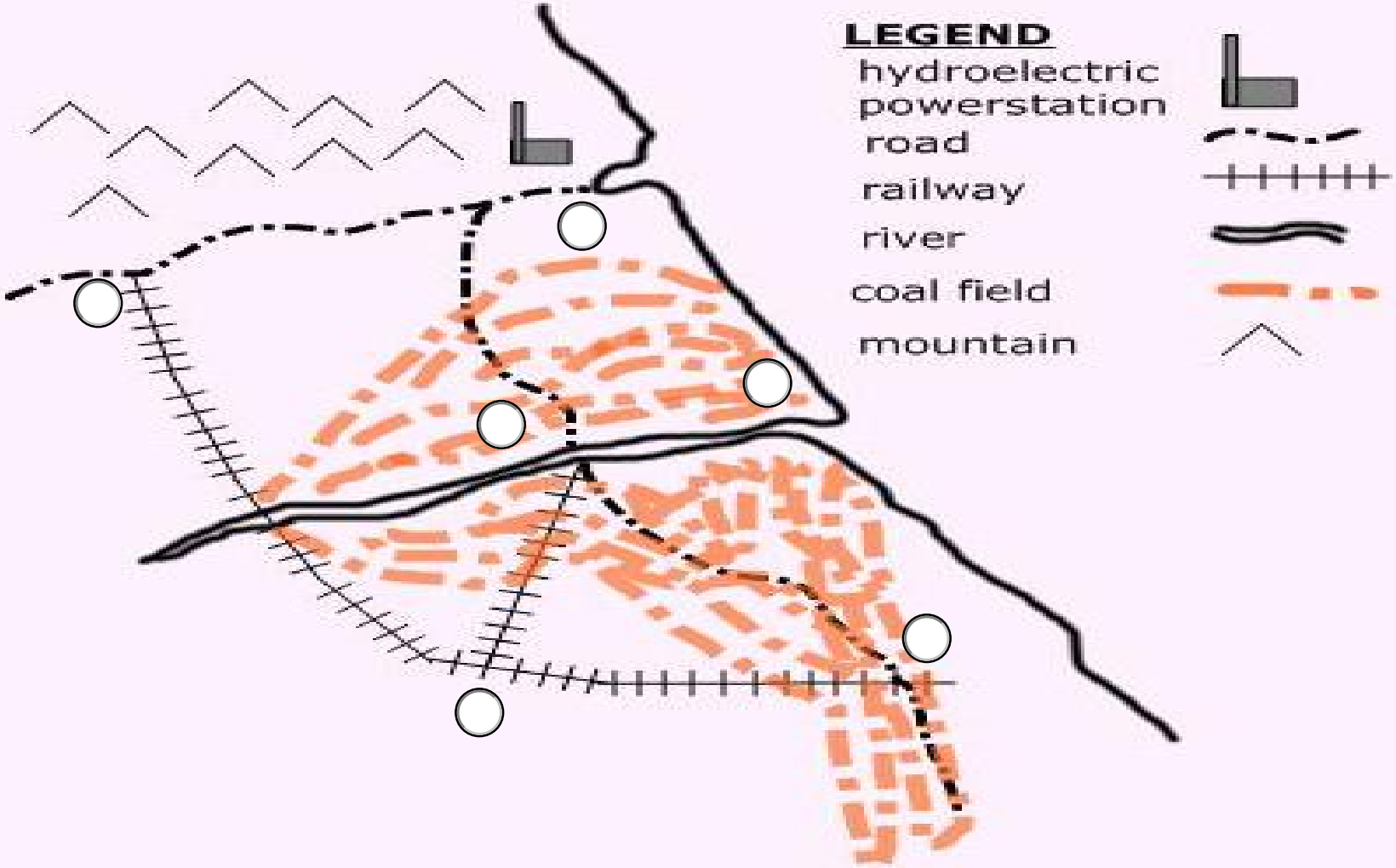
4 ○ Copper, Gold, Iron

Construction of a metal extraction plant

There are several factors that need to be considered before the construction of a metal extraction plant namely:-

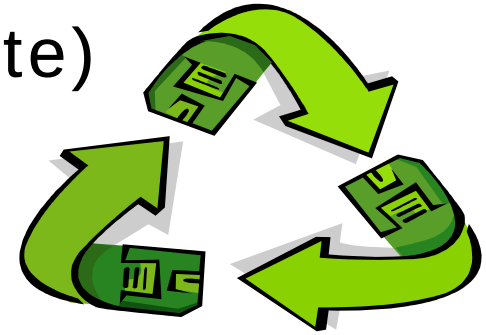
- availability of raw materials
- ease of access
- bulk transport facilities
- electrical supply
- proximity of residential areas
- environment-friendly resources

Complete the following diagram to show where you would construct an Aluminium extraction plant. Discuss your idea with your classmates.



Recycling metals

- saves resources (e.g. metal ores)
- creates less waste (e.g. mining waste)
- saves energy resources
- reduces air pollution



Can aluminium cans be recycled to produce sheets or bars?

1 ○ Yes

2 ○ No

EVALUATION AND REINFORCEMENT

The additional worksheets are meant to reinforce understanding of basic concepts in the chapter of **METALS**.

Complete the following Concept map – Team up

uses

Copper

☐ Bronze/Brass ☐

.....

☐ Bronze/Brass ☐

.....

Zinc

Metals

Aluminium

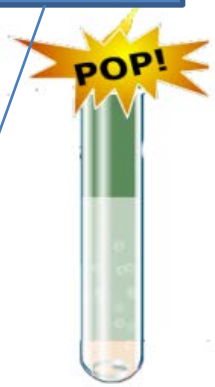
Physical properties

Symbol

Use

Iron

Reacts with acid to form



Nitrogen

- Select the objects which are made up of

(i) Aluminium (ii) Iron (iii) Copper

Aluminium

Electric wires

Aluminium

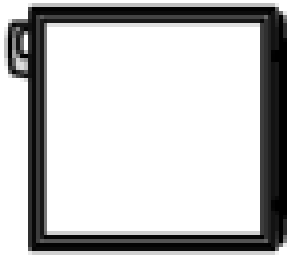
Spitfire Fighter plane

Aluminium

Ring

Austin Ruby

Copper



Fridge

Copper

Sword

Copper

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