

Subject: Chemistry

Topic: Limited resources of metal ores and conservation of metals

Level: S.3

Learning objectives:

1. Content:

Students should be able to:

- i. state the reasons for conserving metals;
- ii. suggest suitable methods for conserving metals.

2. Language:

Students should be able to:

- i. state the reasons for conserving metals using the following sentence patterns:

There is a need for conservation of metals because...

We need to conserve metals as ...

We need to conserve some metals such as.... due to the fact that ...

- ii. write a paragraph to suggest suitable methods for conserving metals.

S.3 Chemistry
Metal
Limited Resources of Metal Ores and Conservation of Metals
Worksheet 3

Name:_____ Class:_____ No.:_____ Date:_____

Activity 1: Is there a need to conserve metals?



1. Work in groups of four.
2. Study the information in the table below about the estimate of how long some metals will last on Earth.

Gold	22 years
Zinc	23 years
Copper	38 years
Chromium	110 years
Iron	195 years
Aluminum	250 years

3. With reference to the data above, discuss the relationship between the amount of different metals on Earth and how we use them.
 - a) Find a leader, two secretaries and a reporter for the group. The leader is responsible for making sure that the discussion moves on. The secretaries are responsible for jotting down notes of the discussion. The reporter is responsible for reporting the discussion to the class.
 - b) Spend 15-20 minutes on your discussion. Then based on the notes jotted down by the two secretaries, work out together your presentation for the reporter to report to the class. Use the large poster paper to draft your presentation. You can use any format for your presentation (e.g. a mind map, a list of points, a for and against / pros and cons table....). All posters will be posted in the classroom after the lesson.
 - c) Three groups will be called on to report. Each presentation should only be 5 minutes. Good luck.
4. Below are some questions to help you but you can use any other data or issues as you go along.

- a) Which metal will last longest? Which metal will be most quickly used up?
- b) What are these metals used for? (Remember what we have learnt in the first lesson? Use this sentence: *The _____ (metal) is used to ...*)
- c) Do you think that there is a need to conserve this metal? Yes/No? Why/Why not?
- d) Is this metal expensive? Yes/No? Why/Why not?
- e) Are there any people collecting these metals after use in Hong Kong? Yes/No? Why/Why not?

5. To summarise, you can use the following sentence patterns:

There is a need for conservation of metals because...

We need to conserve metals as ...

We need to conserve some metals such as.... due to the fact that

Activity 2: How can we conserve metal resources?



1. Work in pairs.
2. With reference to the diagrams below, discuss and find out the methods we can use to conserve metals.
3. The following words might be helpful:

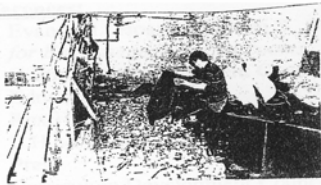
used metal objects/articles, waste, recycle, reuse, replace, conserve, non-renewable, run out

4. Write a short text to summarise your findings. You may begin with:

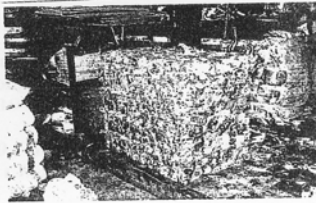
Metals are _____ resources. When the ore is dug up, no new ore forms to _____ it. The supply of metals on Earth will finally _____. Therefore we need to _____ metals.

Common methods used to conserve metals are:

- a) _____
- b) _____
- c) _____
- d) _____



These aluminium cans have been collected from rubbish bins.



The crushed cans are delivered to metal refineries, where they are melted and made into new cans.



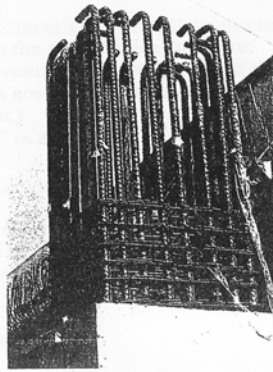
Some objects made of metals



Fig. 10.3 A scrapyard



Old steel collected for recycling.



Steel reinforcing rods using recycled iron



Plastic pipes from recycled material