University of Bejaia **Mechanical Engineering Department**

Level: 3rd Year LMD **Teacher**: Miss Aissi

The study of metals began in the middle Ages when alchemists searched for a technique to convert "bases metal", like lead, to gold. They never succeeded in making gold but at least by experimenting with the metals.

Iron, the most widely used metal, is rarely found in the free state (not combined with other metals) and must be extracted from naturally occurring compounds such as pyrite. The beautiful colors of rocks are due almost entirely to these iron compounds. In fact, iron pyrite is often called fool's gold because of the similarity of its color to gold.

Aluminum is the most abundant metal, but it was not used until a century ago because it is so active chemically and difficult to extract. Like iron it is solid, but in contrast to iron and steel, aluminum is very light. These qualities make it useful for airplanes, trains, automobiles…….

In the 194s, magnesium emerged as an important metal. Although it is less abundant in the earth, more chemically active and harder to extract than aluminum, it is present in sea water and then means there is almost an endless supply for it.

What is a metal?

A metal is a solid material which is typically hard, fusible, and ductile with good electrical and thermal

What is an alloy?

An alloy is a combination of two or more elements.

The oldest metals discovered around 6000 BC are:

Gold, silver, iron and copper.

What makes iron unique?

Iron is the fourth most abundant element in the earth's crust by weight, while iron found in environment that are low oxygen, it is highly reactive to both oxygen and water.

What is the chemical symbol for iron? Fe

What are the main properties of aluminum?

1-Non-corrosive 2-Easily machined and cast 3-Lightweight yet durable
4-Non-magnetic and non-sparking 5-Good heat and electrical conductor

Is aluminum man made or natural?

Aluminum is one of the 18 elements that is found on the periodic table of elements. This means that is natural.

What metal is lighter than aluminum?

Magnesium is extremely light: it is 33% lighter than aluminum. It has the highest known damping capacity of withstanding 10x more than aluminum, it is very is to machine, and can be injection molded.

Which do phases in an alloy depend on?

1-Temperature 2-Composition and temperature 3-Composition

2/Metals with high melting points like titanium are useful because they can withstand high temperature.

Bronze is used for makin,g metals: true/ false

True: Bronze is an alloy with base metal as copper and is used for making metals and some musical instruments.

How can you tell the difference between Aluminum and magnesium?

Magnesium is distinguished from aluminum by the use of a silver nitrate solution. The solution does not react with aluminum but leaves a black deposit of silver on magnesium. Magnesium is produced in large quantities from sea water.

List of chemical symbols:

Name of element	**Chemical symbol**
Iron	**Fe**- Ferrum
Copper	**Cu**- Cuprum
Silver	**Ag**- Argentum
Gold	**Au**- Aurum
Potassium	**K**- Kalium
Magnesium	**Mg**-Magnesiom
Calsium	**Ca**- Calsium
Lead	**Pb**- Plumbum
Oxygen	**O**- Oxygenium
Sodium	**Na**- Natrium
Hydrogen	**H**- Hydrogenium