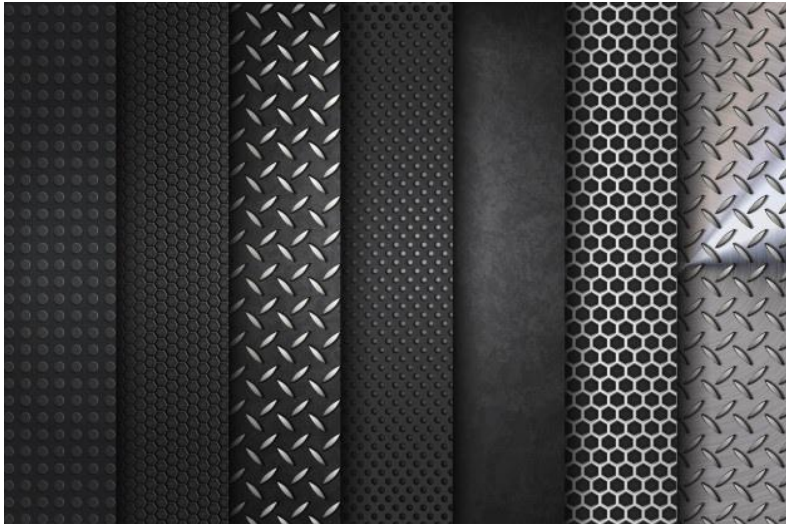


Subject: Building Material and Construction-IV

Topic: Metals-I

Presented by: Nilofar Saifi

Metals : and its Types



THE PROPERTIES OF METALS:

- Hard
- Non-adhesive
- Cold and smooth
- Often shiny



Vocabulary:

-Smooth: A surface that is not rough

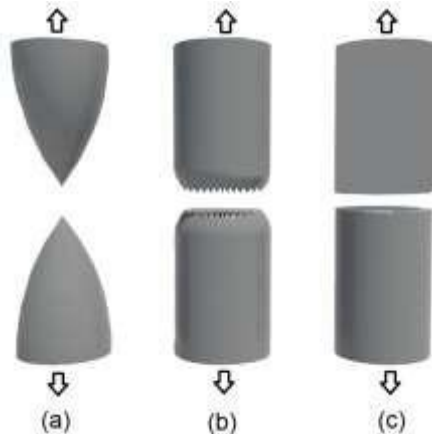
-Shiny: reflects light of a smooth or polished surface

- **PHYSICAL PROPERTIES:**

- **Strong:** Can resist forces while not becoming deformed easily.
Ex. Tensile...



- **Ductile and malleable:** Can be made into wire or thin sheets.



- **Tough:** Don't break easily.

- **Electrical, thermal and acoustic conductivity:** They're good conductors for electricity, heat and sound.



- **Magnetic:** Magnets attracts some metals.



- **Fusible:** Can be easily welded to other metallic objects.



- **Expansion and contraction:** When the temperature rises, they expand and when it falls, they contract.



- **Plastic and elastic:** Some metals are elastic, they can bend and return to their original shape when they are affected by external forces.

- **CHEMICAL PROPERTIES:**

- **Oxidation:** React with oxygen in water and air



- **ECOLOGICAL PROPERTIES:**

- **Recyclable and reusable:** Most metals are recyclable: when they have been used, they can be processed to be used again.



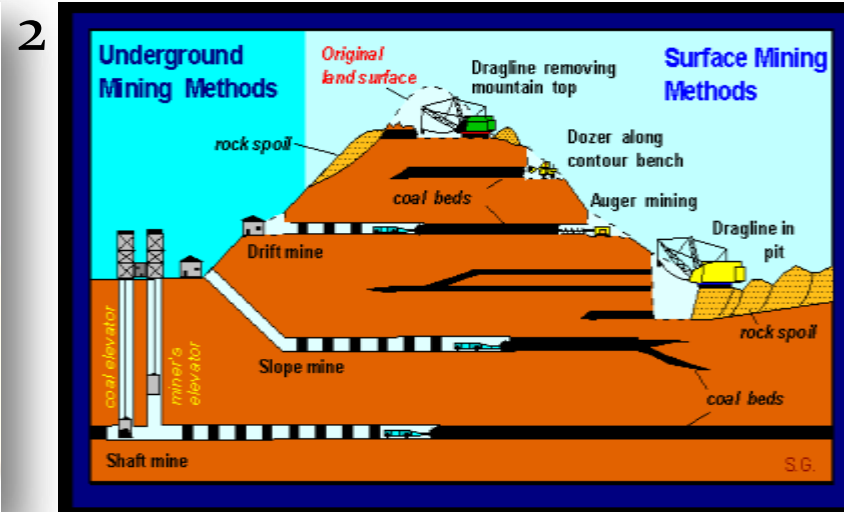
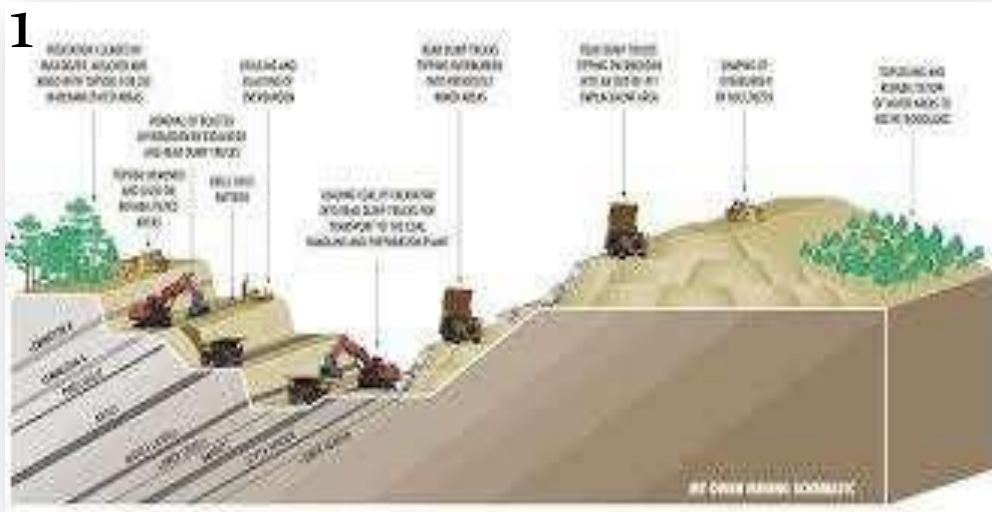
- **Toxic:** Some metals, such as lead or mercury, present a danger to human beings and the environment.

Where and how metals are obtained?

Metals are taken from minerals contained in rocks.

1 SURFACE MINING: is used when the mineral layer is near the surface.

2 UNDERGROUND MINING: is used when the mineral is deep below the surface.



Ferrous materials

CHARACTERISTICS:

- Common.
- Inexpensive to extract.
- Need processing to produce pure iron.
- Used to make alloys.

ALLOY: is a mixture of two or more chemical elements

THERE ARE THREE TYPES OF ALLOYS:

1 Pure iron.

2 Steel.

3 Cast iron.



Steel

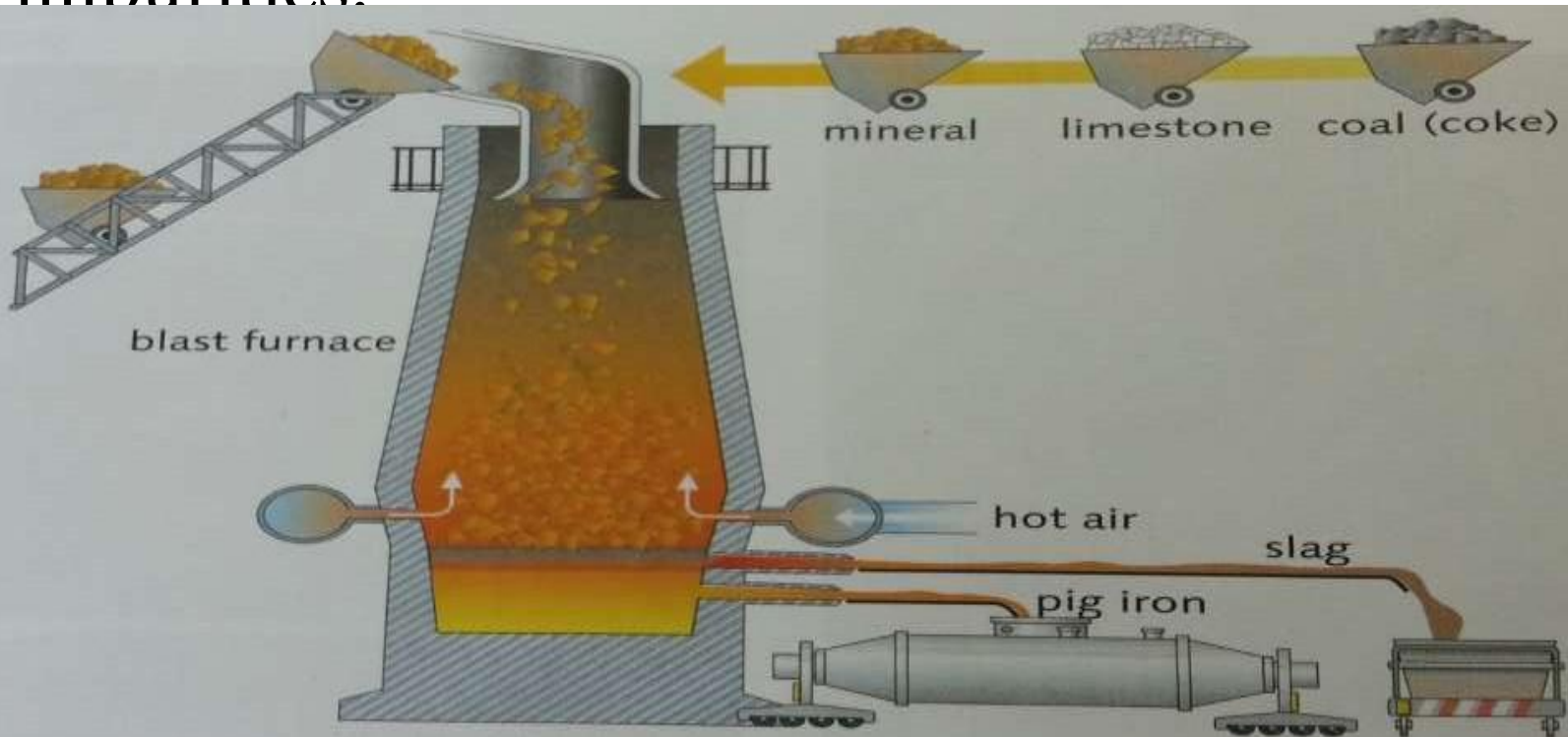
- Alloy steels

- Silicon: makes the alloy magnetic and improves elasticity.
- Manganese: makes the alloy harder and heat-resistant.
- Nickel: improves strength and prevents corrosion.
- Tungsten: makes the steel harder, more heat-resistant, and prevents corrosion.
- Chrome: makes the alloy harder and tougher and more rustproof.
- Lead: makes it easier to cut steel with machine tools.



-The steelmaking process

- 1- The iron mineral is washed to remove impurities.



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