  
**NAFIS FORKAN**  
CO-COUNCILOR  
League of Legends Bangladesh Official  
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Dedicated team of young designers with astonishing experience and always exceeding our expectations.   
  
**  
Sohel Akter**  
PPROGRAM MANAGER  
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it’s just incredible how far they’ve come. Most importantly, they’re never done presenting us with the most top tier designs.

**Arif Haque**  
FOUNDER  
Exceeli eSports  
it’s just incredible how far they’ve come. Most importantly, they’re never done presenting us with the most top tier designs.

**Exception 1**  
Al has an oxide layer Al2O3, which is non-porous. Al act as less reactive metal.  
When oxide layer is removed with sand paper, Al can react and act as a High Reactive Metal.

**Exception 2**  
Hydrogen is a gas. Lead is of the same reactivity as Hydrogen. Cu & Ag are below Hydrogen in the reactivity series, so they cannot displace Hydrogen.

**Exception 3**  
Carbon is in between High Reactive Metals & Moderate Reactive Metals. Carbon is more reactive than any Moderate Reactive Metal and less reactive than any High Reactive Metals.

**High Melting Point** 🡪 Strong Metallic Bonding  
**Low Melting Point** 🡪Weak Metallic Bonding

**REACTIONS***Metal + Cold H2O 🡪 Metal Hydroxide + Hydrogen Gas*  
Observations:  
- Silvery Solid Dissolves  
- Bubbles of a gas  
- Temperature Increases  
2Na + 2H20 🡪 2NaOH + H2

*Metal + Steam 🡪 Metal Oxide + Hydrogen Gas*  
Observations:  
- Silvery solid turns into white solid  
- Color becomes dull  
Ca + H2O 🡪 CaO + H2

*Metal + dil. Acid 🡪 Crystals + H2*  
Mg + 2HCl 🡪 MgCl2 + H2  
Zn + H2SO4 🡪 ZnSO4 + H2  
Displacement Reactions, Mg & Zn more reactive than Hydrogen so, Hydrogen is displaced from its aqueous compound.

**Alloys**Mixtures of Metals. Sometimes non-metal are also added. Good Conductor of Heat & Electricity.  
Examples:  
Brass 🡪 mixture of Zinc & Copper  
Stainless Steel 🡪 Iron, Nickel, Chromium & Carbon  
Steel has resistance to corrosion so does not rust. Used in Cutlery.

**Comparison with METALS  
  
- Alloys are Less Malleable & Ductile**Different Ionic Radius, Different size of atoms, irregular arrangement, layers cannot slide past each other. Layers cannot slide past each other when pressure is applied.  
 **- Metals are More Malleable & Ductile**Same Atomic Radius as contains only one element, same type of atoms, regular arrangement. Layers can slide pas each other when pressure is applied.

**Displacement Reactions of Metals**  
More reactive metal displaces less reactive metals from its Aqueous Compound/Solution.  
COLOR CHANGE is involved in the reaction.  
Observations:  
- Silvery Solid, Zn dissolved, decrease in size  
- Blue Color Fades  
- Pink Solid Deposits  
Zn(s) + CuSO4(aq) 🡪 ZnSO4(aq) + Cu(s)

**Extraction of Aluminium**Electrolysis of Al2O3  
Ore 🡪 Bauxite 🡪 Al2O3.3H2O

High Melting Point 🡪 2000C  
Add Cryolite 🡪 Na3AlF6 🡪 M.P. Drop to 1000C