Other Materials

1. Metals

Properties of Metal

- Solid at room temperature
- Shiny appearance when polished
- Excellent conductors of electricity
- Excellent conductors of heat
- Expand when heated
- Ductile and malleable (hammer into sheets and drawn into wires)

Types of Metal

- Metals can be divided into three categories

A. **Ferrous Metals**: Contain a certain amount of iron and corrode by rusting

B. **Non-ferrous Metals**: Contain little or no iron and do not rust

C. **Alloy**: Two or more metals mixed together to gain the best properties of each metal.

(a) Ferrous metals

1. Cast Iron:

- Use: Gates, railings,, garden bench, manhole covers, fireplaces, cooking utensils, radiators

(a) Ferrous metals

2. Steel:

A mixture of iron and carbon.

Carbon gives the steel strength.

Types of steel

a. **High carbon steel**

- Use: tools that withstand wear, chisels, saws, planes

b. **High speed steel**

- Very strong and very hard
- Use: Woodturning tools, drill bits

c. **Stainless steel**

Use: kitchen and bathroom sinks, cutlery, taps, kettles

(b) Non- Ferrous metals

Four main types

1. Aluminium

Uses:

Windows, doors, drinks cans,

boats, spacecraft's

(b) Non- Ferrous metals

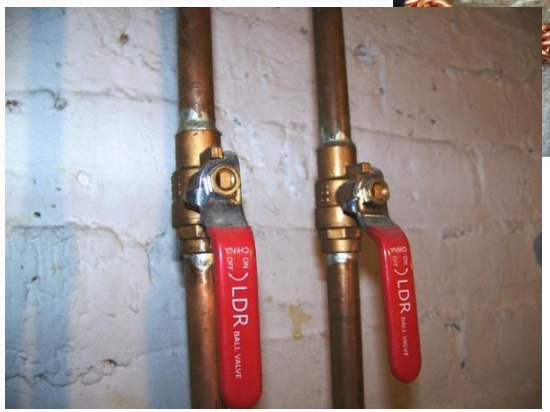
Four main types

2. Copper

Uses:

Keys, jewellery, hot water pipes

Electric wires



(b) Non- Ferrous metals

Four main types

3. Zinc

Uses:

Nails, screws, toys

4. Tin

Uses:

Paint and food containers

(c) Alloy

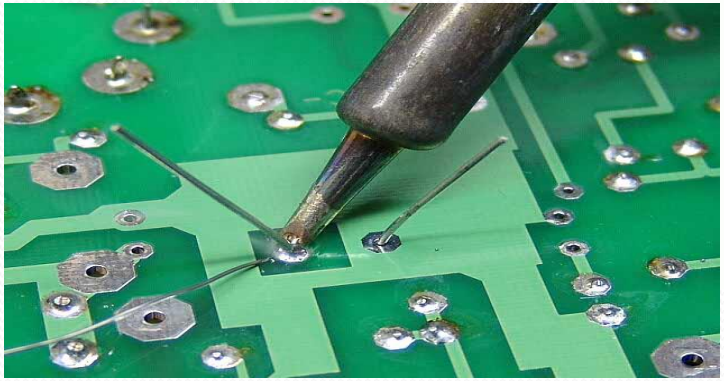
An alloy is **two or more** metals mixed together

Examples:

Brass: copper and zinc

Bronze: copper and tin

Solder: Lead and tin

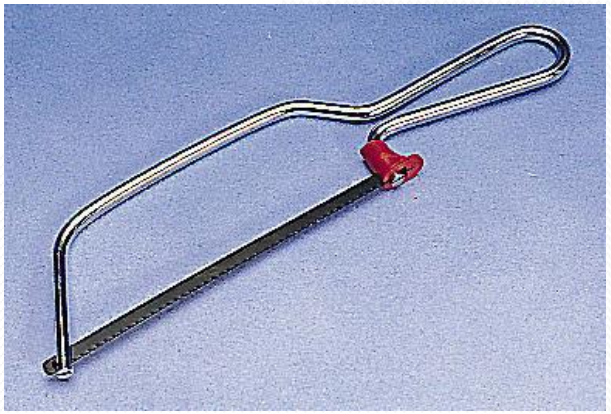


Metal Working Tools

- **Venier Callipers**: measure thickness
- **Metal Scriber**: marking and cutting lines
- **Centre punch**: starting holes in metal and plastic

Metal Working Tools

- **Hacksaw**: cut metals and plastics
- **Junior hacksaw**: cut light metals and plastic
- **Snips**: cutting tin sheets
- **File**: shaping and smoothing metal



Finishing metals

Polishing

- Buffer pad is used to achieve a fine finish.
- Wire brush attached to a power drill

Painting

- The paint is applied in layers

1. Remove grease
2. Apply primer
3. Undercoat 1
4. Undercoat 2
5. Finishing

Preventing Rust

- **Galvanising:** This is where the metal is dipped or coated in a vat of zinc. Zinc is corrosive resistant and prevents rusting
- **Painting** the metal will prolong the life but has to be done periodically (like yearly) to avoid corrosion