Physical Properties of Materials

Important vocabulary:

Insulator: a material which doesn't allow electricity, heat or sound to pass easily through it.

Solder: join metals using a mixture of hot metal

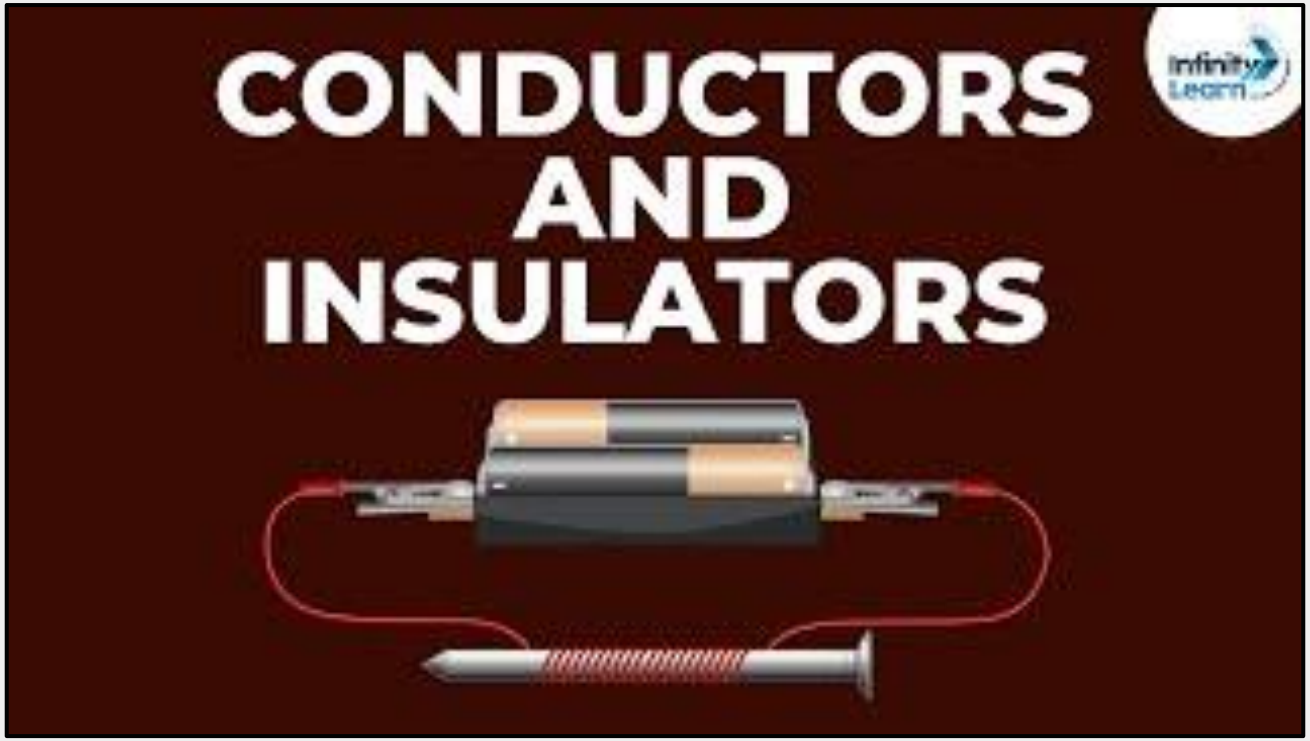
Stretch: make something longer or wider by pulling.

Thread: long, thin fibre

Scratching: damaging a surface by making a thin mark with a sharp object.

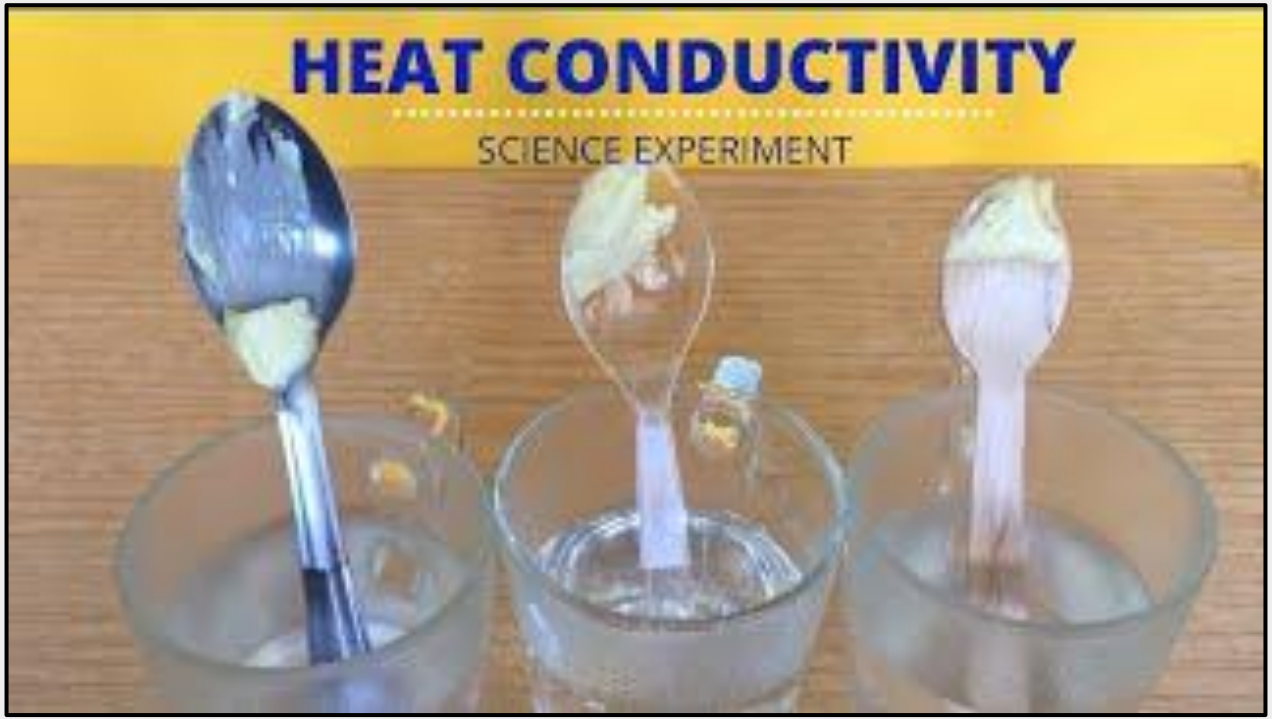
Electrical Conductivity

Electrical Conductivity is the capacity to transfer **electricity**. Metals are good electrical conductors. Plastics and wood are electrical ***insulators***.



Thermal Conductivity

Thermal Conductivity is the capacity to transfer **heat**. Metals are good thermal conductors. Plastic and wood are thermal insulators.



Acoustic Conductivity

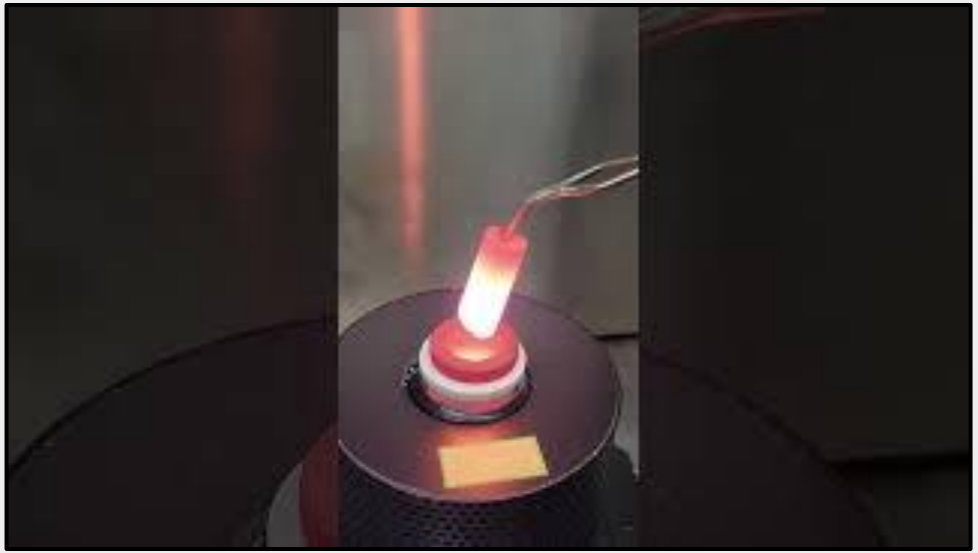
Acoustic Conductivity is the capacity to transmit **sound**. Metals are good sound conductors. Cork, fibreglass and plastics are good sound insulators.

Wood

Foam

Fusibility

Fusibility is the capacity of a material to go from **a solid to a liquid** at a certain temperature. Metals, plastics, and glass can melt, but wood can’t.

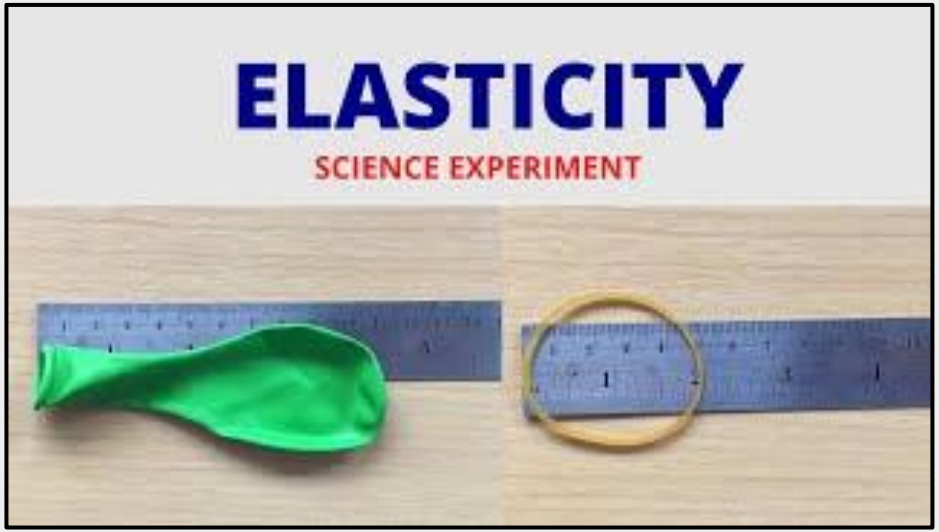


Solderability

Solderability is the capacity to **join** with another material through heat or pressure. Materials we can melt, we can also ***solder***.

Elasticity/Plasticity

Elasticity/Plasticity: Elasticity is a material's capacity to return to its original shape and size when a force stops acting on it. The opposite is plasticity, which is the capacity to stay reshaped permanently.



Elasticity

Plasticity

Ductility

Ductility is the capacity to ***stretch*** to form strings or ***threads***.

Malleability

Malleability is the capacity to extend into sheets.

Magnetism

Magnetism is the capacity to attract other metallic materials.

Toughness/Fragility

Toughness/Fragility is the capacity not to break (toughnesss); or to break (fragility) when hit.

Mechanical Resistance

Mechanical Resistance is the ability of a material to bear external forces without breaking.

Hardness

Hardness is the capacity to resist ***scratching***.

Opacity

Opacity is the capacity to stop light from passing through the material so that we can’t see objects behind the material.

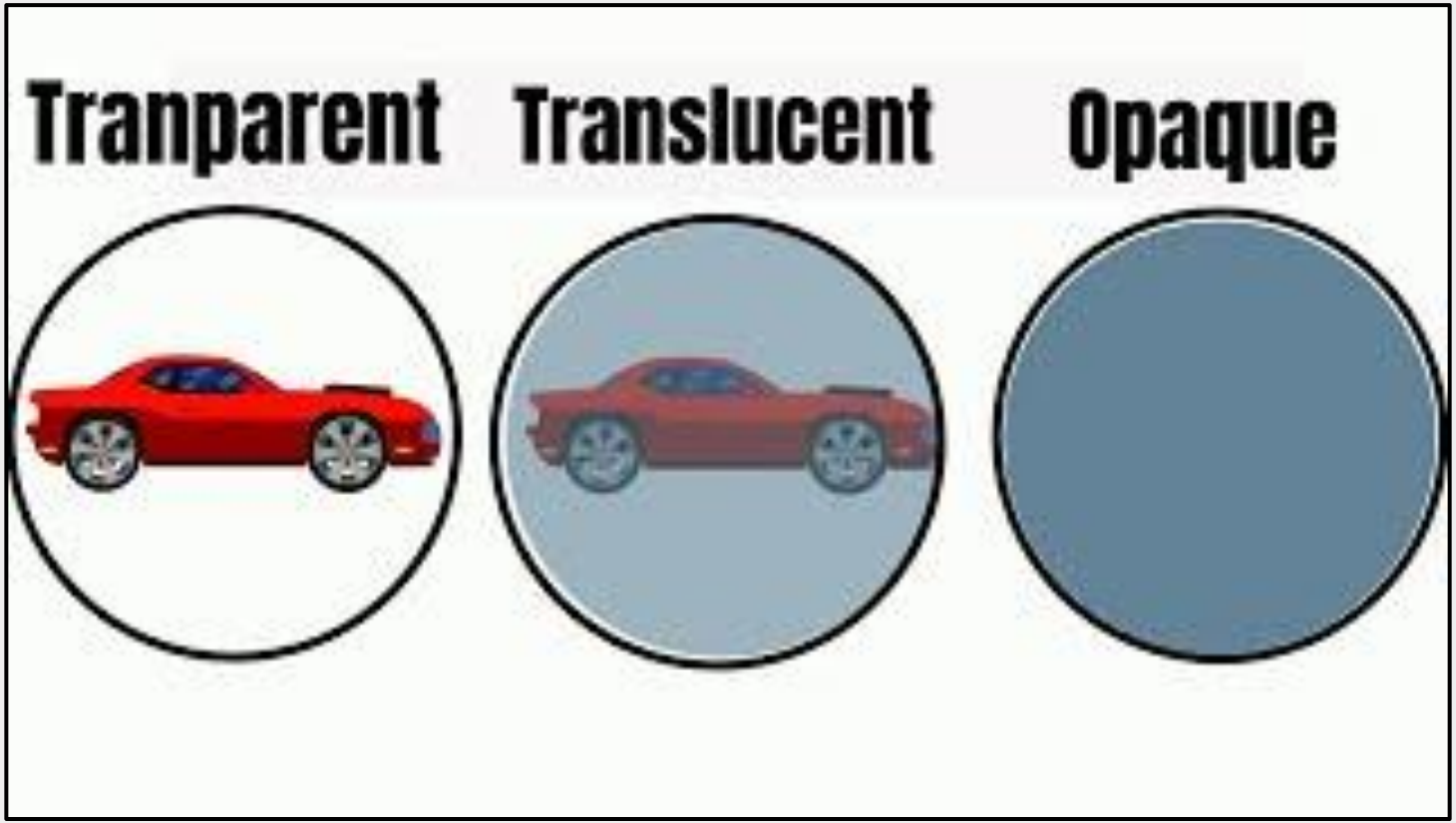
Translucence

Translucence is the capacity to allow light to pass through but not allow us to clearly see the object behind.

Transparency

Transparency is the capacity to allow light to pass through the material so we can clearly see the object behind.

Transparency, Translucence & Opacity



Permeability

Permeability is the ability of a material to allow liquids to pass through it.

Porosity

Porosity is the capacity to absorb and release liquids or gases.

Density

Density is the relationship between the mass and volume of a material.