Design & Technology Department
Schemes of Work
Knowledge Organiser- Materials FPTs

1. Woods

Man-Made Woods

	Description	Uses
Medium density fibreboard (MDF)	•Has a smooth, even surface •Easily machined and painted •Available in water and fire-resistant form •Often veneered or painted to improve its appearance	•Furniture and interior panelling
Chipboard	•Made from chips of wood glued together with urea formaldehyde (glue) •Usually veneered with an attractive hardwood or covered in plastic laminate	•Kitchen and bedroom furniture •Shelving and general DIY Work
Plywood	•A very strong board, constructed of layers of veneer or piles, which are glued together with the grains at 90° to each other •Interior and exterior grades available.	•Furniture making •Boat building and exterior work
Hardboard	•A very cheap particle board •Can have a laminated plastic surface	•Kitchen unit and furniture back panels

Hard Woods

	Description	Uses
Oak	•A very strong, light-brown wood •Open grained •Very hard, but quite easy to work with	•High quality furniture •Beams used in building •Veneers
Mahogany	•Reddish-brown in colour •Easy to work with	•Indoor furniture •Shop fittings •Bars •Veneers
Beech	•A straight- grained hardwood with a fine texture •Light in colour •Very hard but easy to work with •Can be steam bent	•Furniture •Toys •Tool handles
Ash	•Open grained •Easy to work with •Pale cream colour, often stained black •Can be laminated (i.e. sliced into veneers which are glued together)	•Tool handles •Sports equipment •Furniture •Ladders •Veneers

Soft Wood

	Description	Uses
Pine	•Pale-yellow coloured with dark lines and a fine, even texture. •Medium in weight •Stiff and stable •Inexpensive	•Readily available for DIY work •Mainly used for constructional work and simple joinery •Furniture

2. Plastics

	Properties:
Acrylic	• Hard wearing • Will not shatter • Can be coloured • Bathtubs, School Projects, Display signs
Polypropylene	•High Impact strength •Softens at 150°C •Can be Flexed many times without breaking •School chairs, Crates
High Impact Polystyrene (HIPS)	•Light but strong •Widely available in sheets •Used for casings of electronic products
Polythene (LDPE)	• Weaker and softer than HPDE. • Lightweight • Carrier Bags + Squeezy Bottles
Polythene (HDPE)	•Stiff strong plastic •Used for pipes and bowls •Buckets
Urea formaldehyde	•Colourless plastic •Can be coloured •Door and cupboard handles, Electrical fittings

3. Material Properties

Strength
The ability of a material to stand up to forces being applied **without it bending, breaking, shattering or deforming in any way**.

Elasticity
The ability of a material to **absorb force and flex in different directions, returning to its original position.**

Ductility
The ability of a material to **change shape (deform) usually by stretching along its length.**

Malleability
The ability of a material to be **reshaped in all directions without cracking.**

Hardness
The ability of a material to **resist scratching, wear and tear and indentation.**

Toughness
A characteristic of a material that **does not break or shatter when receiving a blow or under a sudden shock.**

3. Metals

	Properties:
Aluminium	•Light Weight •Light grey in colour •Can be polished to a mirror like appearance •Rust resistant
Mild Steel	•Heavy •Dark grey in colour •Rusts very quickly if exposed
Stainless Steel	•Heavy •Shiny appearance •Very resistant to wear / rust.
Cast Iron	•Re melted pig iron with some quantities of other metals •Strong in compression. •Brittle
Copper	•Reddish brown metal. •Soft •Excellent conductor of heat and electricity
Brass	•Yellow metal •Hard •Alloy

4. Composites

Carbon Fibre	GRP Fibreglass
Expensive in comparison to other materials. Very good strength to weight ratio. Used in the manufacture of high end sports cars and sports equipment.	GRP is composed of **strands of glass which are woven to form a flexible fabric. The fabric is normally placed in a mould and polyester resin is added.** **Glass reinforced plastic is lightweight** and has **good thermal insulation properties.** It has a **high strength to weight ratio**