

Softwoods

Remember PINCERS:

P - Pine

I - Indicates

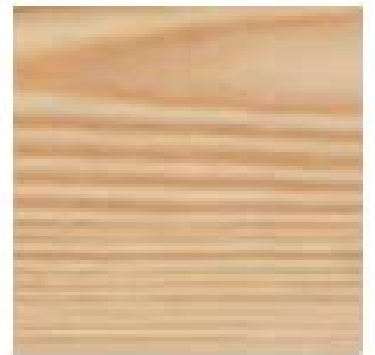
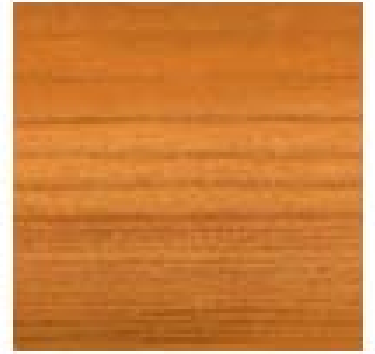
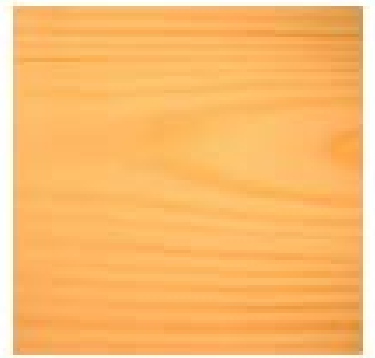
N - Needles

C - Cedar

E- Evergreen

R -Redwood

S- Softwood



Hardwoods

Remember BAD HOTEL

B - Balsa

A - Ash

D - Deciduous

H - Hardwood

O - Oak

T - Teak

E - Expensive

L - Loses leaves



Manufactured Boards

Remember SLIM CHIMP!

S- Squashed

L- Layers

I- Industrial

M- Manmade

C- Chipboard

H- Hardboard

I- Inexpensive

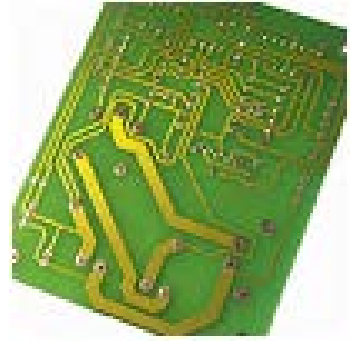
M- MDF

P - Plywood



Thermosetting plastics

Thermosetting plastics can only be heated and shaped once. If re-heated they cannot soften as polymer chains are interlinked. Separate polymers are joined in order to form a huge polymer. The main thermosetting plastics are epoxy resin, melamine formaldehyde, polyester resin and urea formaldehyde.



Remember Bets Pup!

B - Bakelite

E - Epoxy resin

T - Thermosetting

S - Shaped once

P- Polyester resin

U - Urea formaldehyde

P- Plastic

Thermoplastics

Thermoplastics can be heated and shaped many times. Thermoplastics will soften when it is heated and can be shaped when hot. The plastic will harden when cooled, but can be reshaped because there are no links between the polymer chains. Some common thermoplastics are ABS, Nylon, acrylic, uPVC, polystyrene, polypropylene and cellulose acetate.

Remember Paps Hat !

P - Polythene

A - Acrylic

P - Polypropylene

S - Shaped many times

H- HIPS

A - ABS

T- Thermoplastics



SMART MATERIALS

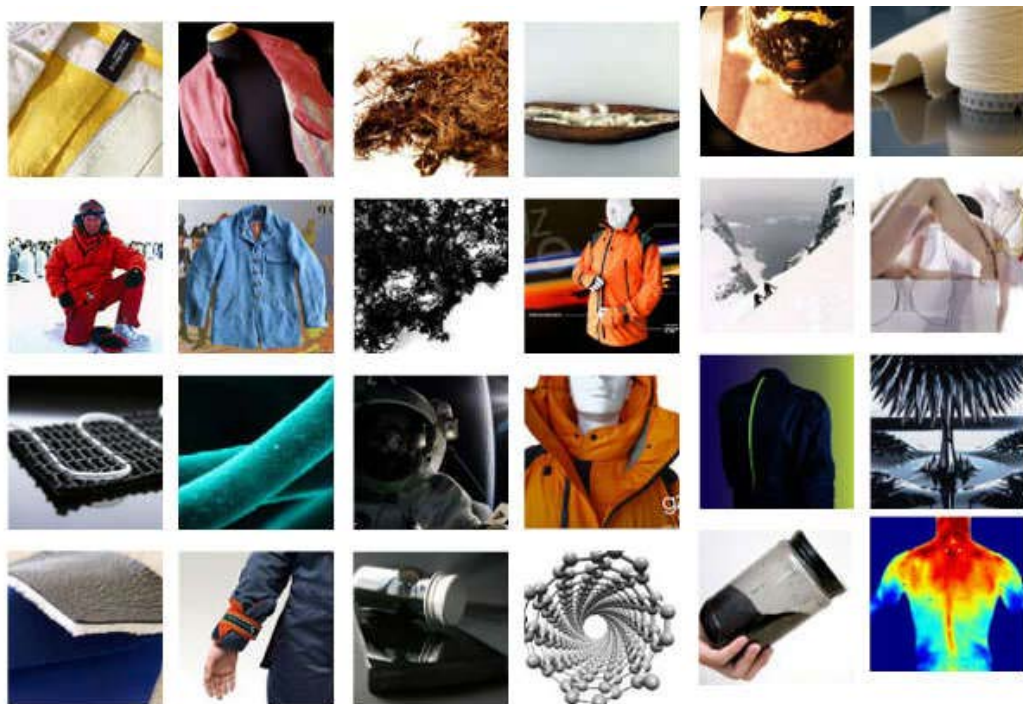
Smart materials are reactive **materials**.

Their properties can be changed by exposure to stimuli, such as electric and magnetic fields, stress, moisture and temperature

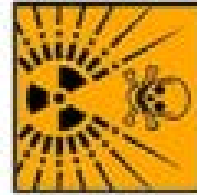
Thermochromic materials

Photochromic materials

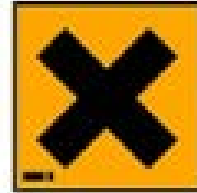
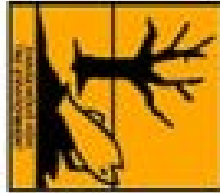
Shape-Memory Alloy (SMA)



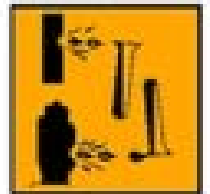
COSHH



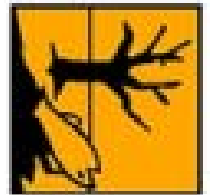
Control



Of



Substances



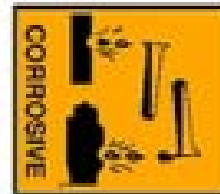
Hazardous



to

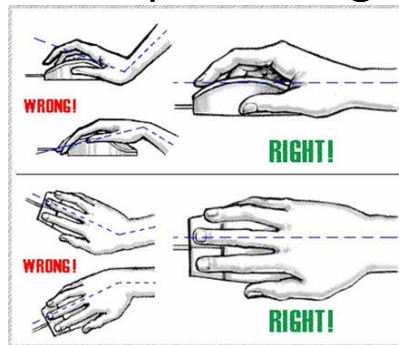


Health



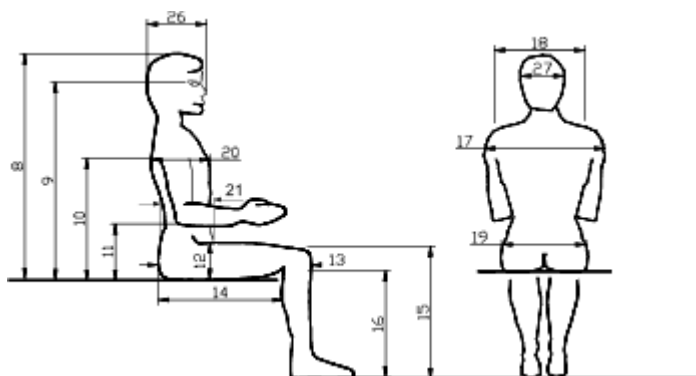
ERGONOMICS

Ergonomics is about designing for people, wherever they interact with products, systems or processes. We usually don't notice good design (unless perhaps, it's exceptional) because it gives us no cause to, but we do notice poor design.



ANTHROPOMETRICS

The study of the human body and its movement. The study of the human body and its movement, often involving research into measurements relating to people. It also involves collecting statistics or measurements relevant to the human body



DEFORESTATION

Is the process whereby natural forests are cleared through logging and/or burning, either to use the timber or to replace the area for alternative uses.



REFORESTATION

Is the natural or intentional restocking of existing forests and woodlands that have been depleted, usually through deforestation.



NON FERROUS METALS

Name	Composition	Properties	Uses
Aluminium	Pure Metal	Greyish-White, soft, malleable, conductive to heat and electricity, It is corrosion resistant. It can be welded but this is difficult. Needs special processes.	Aircraft, boats, window frames, saucepans, packaging and insulation, pistons and cranks.
Aluminium alloys- Duraluminium)	Aluminium +4% Copper+1%Manganese	Ductile, Malleable, Work Hardens.	Aircraft and vehicle parts.
Copper	Pure metal	Red, tough, ductile, High electrical conductor, corrosion resistant, Can work hard or cold. Needs frequent annealing.	Electrical wire, cables and conductors, water and central heating pipes and cylinders. Printed circuit boards, roofs.
Brass	65% copper +35%zinc.	Very corrosive, yellow in colour, tarnishes very easily. Harder than copper. Good electrical conductor.	Castings, ornaments, valves, forgings.
Lead	Pure metal	The heaviest common metal. Soft, malleable, bright and shiny when new but quickly oxidizes to a dull grey. Resistant to corrosion.	Protection against X-Ray machines. Paints, roof coverings, flashings.
Zinc	Pure metal	A layer of oxide protects it from corrosion, bluish-white, easily worked.	Makes brass. Coating for steel galvanized corrugated iron roofing, tanks, buckets, rust-proof paints
Tin	Pure metal	White and soft, corrosion resistant.	Tinplate, making bronze.
Gilding metal	85% copper+15% zinc.	Corrosion resistant, golden colour, enamels well.	Beaten metalwork, jewellery.

FERROUS METALS

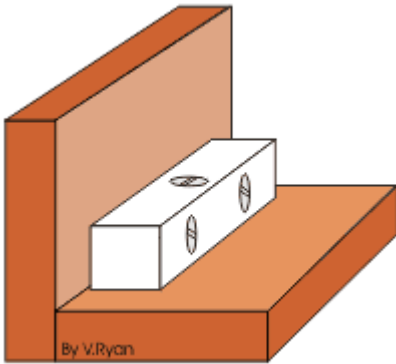
Name	Composition	Properties	Uses
Mild Steel	0.15 to 0.30% carbon	Tough, high tensile strength, ductile. Because of low carbon content it can not be hardened and tempered. It must be case hardened.	girders, Plates, nuts and bolts, general purpose.
High Speed Steel	medium carbon, tungsten, chromium and vanadium.	Can be hardened and tempered. Can be brittle. Retains hardness at high temperatures.	Cutting tools for lathes.
Stainless Steel	18% chromium, and 8% nickel added.	Corrosion resistant	Kitchen draining boards. Pipes, cutlery, aircraft.
High Tensile Steel	Low carbon steel,, nickel, and chromium.	Very strong and very tough.	Gears, shafts, engine parts.
High Carbon Steel	0.70% to 1.40% carbon.	The hardest of the carbon steels. Less ductile, tough and malleable.	Chisels, hammers, drills, files, lathe tools, taps and dies.
Medium Carbon Steels	0.30% to 0.70% carbon.	Stronger and harder than mild steels. Less ductile, tough and malleable.	Metal ropes, wire, garden tools, springs.
Cast Iron	Remelted pig iron with small amounts of scrap steel.	Hard, brittle, strong, cheap, self-lubricating. Whitecast iron, grey cast iron, malleable cast iron.	Heavy crushing machinery. Car cylinder blocks, vices, machine tool parts, brake drums, machine handle and gear wheels, plumbing fittings.

Product Analysis

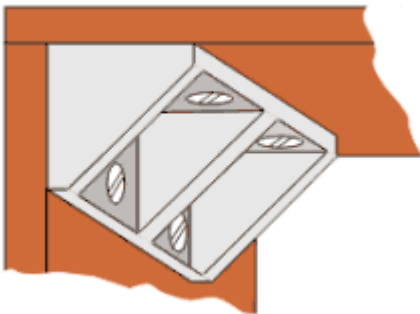


Every product is designed in a particular way - *product analysis* enables us to understand the **materials, processing, economic and aesthetic** decisions which are required before any product can be manufactured. An understanding of these decisions can help us in designing and making for ourselves.

Knock Down Fittings

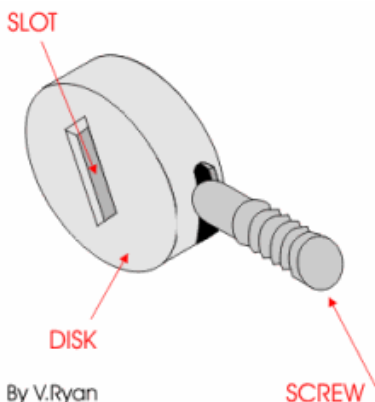


PLASTIC CORNER BLOCK (FIXIT BLOCKS):
The corner block is pressed against the two pieces of material (normally wood based). Screws are used to fix the block into position. It is a relatively strong joint although it has the advantage that it can be dismantled using a screwdriver.



By V.Ryan

RIGID JOINT: These are normally moulded in plastic which makes them strong. Screws pass through the four holes which hold the sides at each corner firmly together



CAM LOCKS –(NOT DAVE)

The disk fits into a recess in the first side of the cabinet. It rotates by inserting a screwdriver into the slot in its side. The shaft is screwed into the second side of the cabinet.

The collar of the shaft is passed through the hole in the second slot in the disk. When the disk rotates the shaft is locked in position. This keeps both sides of the cabinet locked together.

Quality Control

Quality control (QC) is a procedure or set of procedures intended to ensure that a manufactured product or performed service adheres to a defined set of **quality** criteria or meets the requirements of the client or customer. QC is similar to, but not identical with, **quality** assurance (QA).



Quality Assurance

Quality Assurance (QA) is a way of preventing mistakes or defects in manufactured products and avoiding problems when delivering solutions or services to customers.

SCALES OF PRODUCTION

Although you may only produce one final product in school in industry they have different methods of production. Commercial production is split into five categories.

One off production -one product is made often a prototype.

Batch production -A small quantity of the product is made two or more up to one hundred.

Mass production - A large number of the product is made on a production line. Many hundreds of the product could be made. This is often called repetitive flow production.

Continuous production - Many thousands of the product are made. The difference between this and mass manufacturing is that continuous production is on 24 hours a day.

Just in time production - The arrival of parts at just the exact time that they are required in the factory.

