Consequences Chooser Chart

Material	***Where from?***	***Is it renewable?***	***Difficulty of extraction***	***Amount of processing required***	***Can it be easily reused or recycled?***	***Is it biodegradable?***
Natural timber	forests	yes, if managed	low	low	yes	yes
Manufactured boards	natural timber	yes, if natural timber is from managed sources	low	medium	yes	
Metals and alloys	ores	no	high	high	sometimes	no
Common plastics	fossil fuels	no	high	high	sometimes	no

Manufactured Board and Wood Chooser Chart

Material	*Important properties*	*Making tips*	*Cost*	*Typical uses*
Plywood	tough doesn't warp exterior plywood is water-resistant	can split when cut	high	containers flat cut-out figures mechanical parts – links, cams, wheels
Hardboard	brittle goes soggy with water	tears easily difficult to finish edges	low	covering panels
Medium density fibreboard (mdf)	hard keeps edges well goes soggy with water	blunts tools shapes easily finishes well drills well	medium	block models vacuum forming moulds small bases
Chipboard	brittle edges easily damaged	difficult to shape blunts tools finishes poorly catches on drills	low	large bases
Red deal (often called pine)	softwood cream and pale brown colour, often knotty rots unless protected	moderately easy to cut, trim, shape and join	low	simple frameworks block models
Jelutong	hardwood, light colour no knots, more durable than red deal	easy to cut, trim, shape and join	medium	simple frameworks block models, moulds for vacuum forming
Balsa	hardwood whitish pink very soft and light not durable	very easy to shape, cut and rim for joining use balsa cement	high	rapid model-making light-weight structures
Mahogany	hardwood red-brown colour durable	more difficult to work than red deal or jelutong	medium	containers indoor furniture decorative finish

Metals Chooser Chart

Material	*Important properties*	*Making tips*	*Cost*	*Typical uses*
Mild steel	silver-grey colour stiff and strong rusts in moist air ferrous alloy or iron and carbon	easy to join using heat (brazing) difficult to deform or melt and cast quite hard to shape	low	mechanical parts such as axles and linkages frameworks from both string or tube
Aluminium	silver-white colour low density non ferrous	difficult to join using heat easy to deform, shape and cast	medium	castings for jewellery, decorative items and fittings
Copper	pinkish-brown colour good conductor tarnishes slowly in moist air	easy to join using heat (solder) very easy to deform	high	decorative items electrical contacts
Brass	yellow colour hard tarnishes slowly in moist air alloy of copper and zinc non ferrous	easy to join using heat (solder) fairly east to cast	high	mechanical parts such as couplings and bearings decorative items

Plastics Chooser Chart

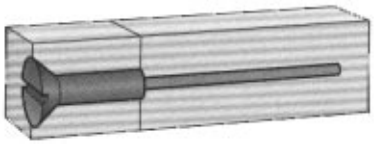
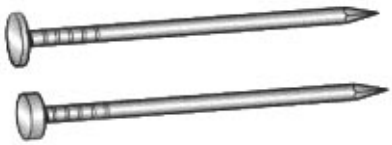
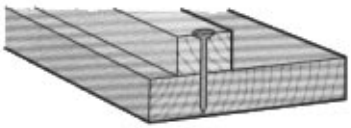
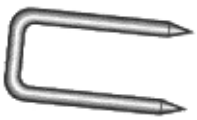
Material	*Important properties*	*Making tips*	*Cost*	*Typical uses*
Acrylic	stiff and strong but not tough scratches easily wide range of colours **thermoplastic**	good for strip heating polishes well join using Tensol cement	medium	containers and storage devices flat cut-out figures mechanical parts – links, cams, wheels
PVC (poly vinyl chloride)	stiff, strong and tough more scratch-resistant than acrylic **thermoplastic**	join using liquid solvent cement) sold as plumbers' material)	medium	containers and storage devices
Polystyrene (high impact polystyrene)	not tough wide range of colours **thermoplastic**	good for vacuum forming join using liquid polystyrene cement	low	shell forms for containers, model boards, model cars
ABS (acrylonitrile butadienne-styrene)	stiff, strong and tough scratches easily wide range of colours **thermoplastic**	easy to cut and trim join using liquid solvent cement	medium	frameworks and mechanical parts – links, cams, wheels
Nylon	stiff, strong and tough self-lubricating **thermoplastic**	machines well difficult to join with adhesives	high	good for bearings and mechanical components
Polyester resin	liquid, sets to a hard solid wide range of colours **thermosetting plastic**	important to use the correct amount of catalyst for hardening	medium	solid, decorative castings reinforced with glass fibre to give strong shell structures

Adhesives Chooser Chart

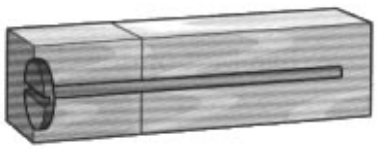
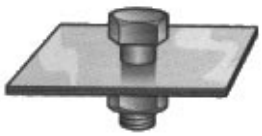
Adhesive	*User*
PVA (polyvinyl acetate) e.g. Evostik Resin W	a general purpose wood glue; not water-resistant
Synthetic resin e.g. Cascamite	for joining wood; waterproof and stronger than PVA; must be made up immediately before use
Epoxy resin e.g. Araldite	for joining metals and acrylic plastics; waterproof; must be made up immediately before use
Contact adhesive e.g. Dunlop Thixafix	for joining polystyrene, fabrics and leather
Acrylic cement e.g. Tensol	for joining acrylic plastics

Fittings Chooser Chart

Fittings for wood

Fitting	*Uses*
Screws 	general wood-working and fitting hinges 
Nails 	general-purpose fixing when appearance is not important 
Panel pins 	to hold pieces together while glue sets; to fix panels to frames
Staples 	to hold fabric to wood

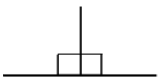
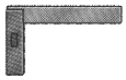
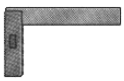
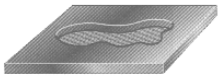
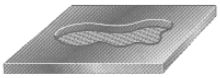
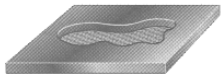
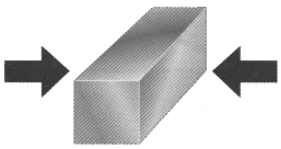
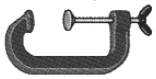
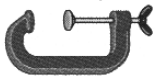
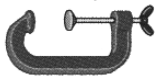
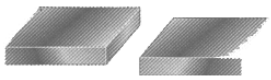
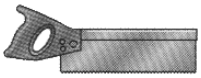
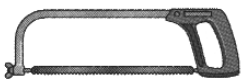
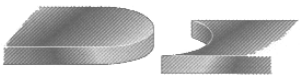
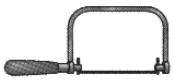
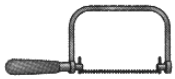
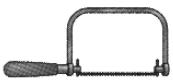
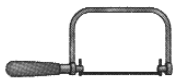
Fittings for metal and plastics

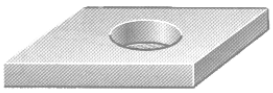
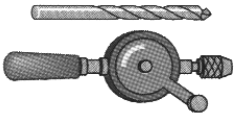
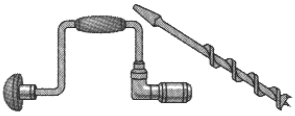
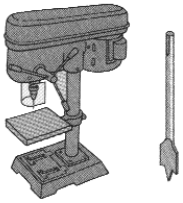
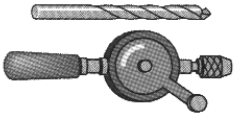
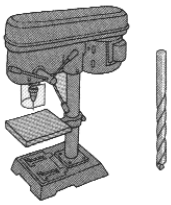
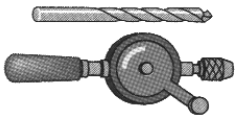
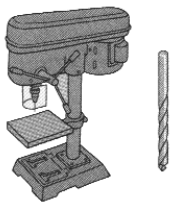
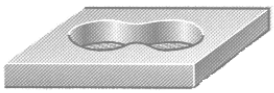
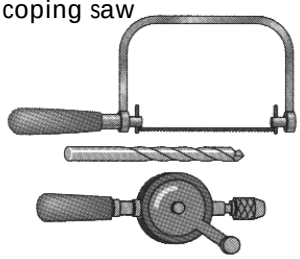
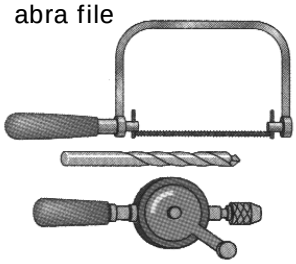
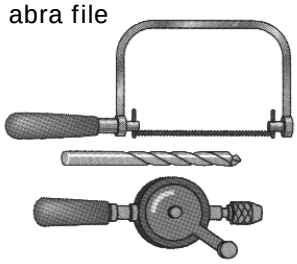
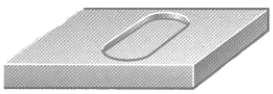
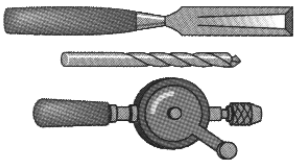
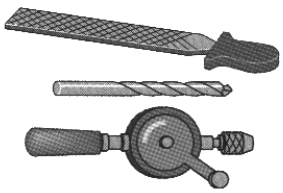
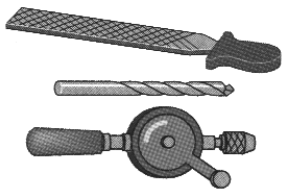
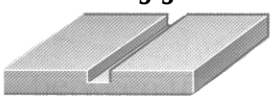
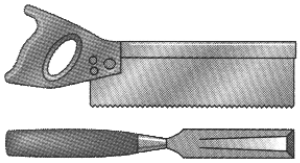
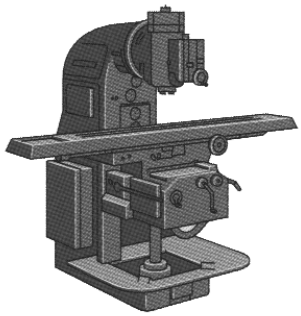
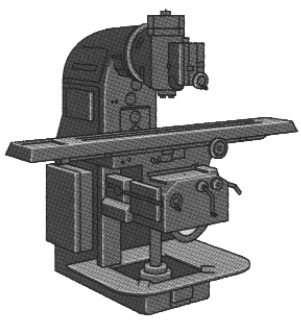
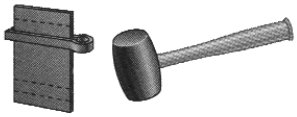
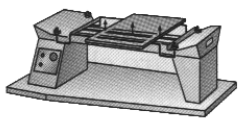
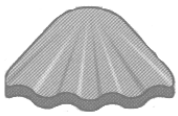
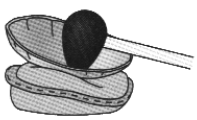
Fitting	*Uses*
Self-tapping screws 	general use 
Nuts and bolts 	for holding components together 
Pop rivets 	for holding sheet materials together; used with a pop riveter ‘gun’  

Finishes Chooser Chart

Finish	*Does it alter appearance?*	*Does it protect the material?*	*Can I use it on wood?*	*Can I use it on metal?*
Paint	Yes	Yes	Yes	Yes
Varnish	No	Yes	Yes	No
Lacquer	No	Yes	Yes	Yes
Enamelling	Yes	Yes	No	Yes
Dip-coating	Yes	Yes	No	Yes
Coloured stain	Yes	No	Yes	No
Linseed oil	No	Yes	Yes	No
Sanding sealer	No	Yes	Yes	No
Oil quenching	Yes	Yes	No	Yes

Tools Chooser Chart

Process	***Wood***	***Metal***	***Plastics***
For marking out	pencil 	scriber 	felt-tip pen or scriber 
• at right angles 	try-square 	engineer's square 	engineer's square 
• parallel to an edge	marking gauge 	odd-leg callipers 	odd-leg callipers 
• an irregular shape 	card template 	card template 	card template 
For holding 	woodwork vice 	metalwork vice 	metalwork vice 
	G-cramp 	G-cramp 	G-cramp 
	machine vice 	machine vice 	machine vice 
For cutting			
• straight lines 	tenon saw 	hacksaw 	hacksaw 
• curves 	coping saw 	tin snips 	abrafile 
	fret saw 	abrafile 	coping saw 
For trimming			
• to a straight line	plane 	flat file 	flat file 
	sanding machine		sanding machine
• to a curve	rasp	flat file	flat file
	surform	round file	round file

Process	*Wood*	*Metal*	*Plastics*
For making holes			
• round holes 	hand drill and twist drills  brace and twist bits  pillar drill and flat bits 	hand drill and twist drills  pillar drill and twist drills 	hand drill and twist drills  pillar drill and twist drills 
• irregular holes 	hand drill, twist drill and coping saw 	hand drill, twist drills and abra file 	hand drill, twist drills and abra file 
For making slots 	hand drill, twist drills and chisel 	hand drill, twist drills and flat file 	hand drill, twist drills and flat file 
For making grooves 	tenon saw and chisel 	milling machine 	milling machine 
For bending 		folding bars and mallet 	strip heater 
For forming 		sandbag and mallet 	vacuum former