Knowledge Organiser: Wood Based Materials

1 Classification of wood based materials

Hardwood	Comes from deciduous trees. Loose their leaves in winter. Slow growing, more durable & expensive than softwood. Sustainable as they are renewable. Used for high quality furniture as it is durable and aesthetic. Suitable for outdoor sue due to its high resistance to decay.
Softwoods	Comes from coniferous trees. Keep their leaves all year round. They are cheaper than hardwoods because they grow quicker. Sustainable as they are renewable. Mostly used for indoor work as some have poor resistance to decay.
Manufactured boards	These are wood based (wood combined with glue). Available in larger sheets than natural timbers. Have consistent properties throughout the board. More stable than natural timbers which means less likely to warp or twist. They use up more of the tree and can make use of lower grade timber which may go to waste. They can be covered with a veneer/laminate to improve the aesthetics.

2 Hardwoods

Ash	Tough and flexible, wide grained. Finishes well. **Uses include:** sports equipment and ladders. Light coloured.
Beech	Hard, strong, closed grained. Prone to warping and splitting. **Uses include:** Furniture, children toys, workshop tool handles and bench tops. Light coloured.
Mahogany	Strong and durable. Available in wide planks. Fairly easy to work with. Dark coloured. **Uses include:** Good quality furniture & veneers.
Oak	Hard, tough, durable, open grain. Can be finished to a high standard. **Uses include:** Timber framed buildings, flooring and high quality furniture.

3 Softwoods

Pine	Straight grained, light yellow in colour, Soft and easy to work with. Can be quite knotty. **Uses include:** interior joinery and furniture.
Spruce	Creamy white in colour, easy to work with and lightweight. Has small knots. Good resonant properties. **Uses include:** bedroom furniture, stringed musical instruments.
Larch	Reddish in colour with an attractive grain. Tough but easy to work with although it can be prone to splitting. Good resistance to rotting. **Uses include:** fencing and decking.
Red Cedar	Durable and lightweight. Reddish colour. **Uses include:** garden sheds and fences.

4 Manufactured boards

MDF (fibreboard)	Fibre combined with glue. Compressed under heated plates to bond the fibres together. Paints well, can be veneered to improve aesthetics. Consistent quality. Stable—does not warp. Uses include: flat pack furniture & kitchen work surfaces.
Chipboard (particle board)	Mix of wood chips and glue compressed. Cheaper than MDF and plywood but not as durable. Very unattractive so is nearly always covered with a veneer/laminate. **Uses include**: kitchen work surfaces, cupboards and flooring.
Plywood (laminate board)	Layers of veneers (thin layers of wood) glued together with the grain at right angles to increase the strength. Always made up of odd number of layers so grain on outside always faces in the same direction. Outside layers often made of better quality wood. than the inside layers. Mostly used indoors. Also available in weatherproof for use outdoors. **Uses include:** laminated flooring, roofing & furniture.

5 Other terms

FSC	Forestry stewardship council. They ensure forests are well managed and replanting happens.
Green timber	Newly cut timber which contains a lot of moisture. High moisture content makes the wood difficult to work with. It will twist, warp and split. It will rot easily and be prone to attack by insects.
Seasoning	This is drying out the green timber to make it more suitable to use.

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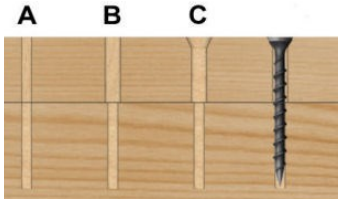
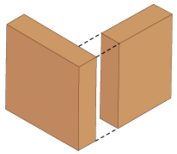
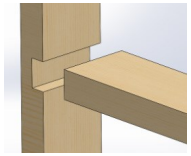
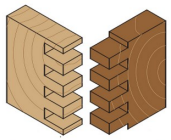
1 Finishing wood based materials

Surface preparation	Before adding a finish the surface must be smooth. Use abrasive papers to smooth the material. Start with a rough glass paper then move on to less rough. You can use wet & dry paper (using it dry) for a very smooth finish.
Wood stain	Stains will change the colour of wood without hiding the patterns of the grain. The stain does not provide protection for the wood.
Wood preservative	These are added to wood to protect them from moisture.
Varnish	Gives the material a protective finish. They can be shiny or matt (not shiny). They should be applied in thin layers using a brush and allowed to dry between layers. Polyurethane varnish is plastic based which helps protect from moisture.
Oil	This is used to protect wood from moisture. It is applied in thin layers using a cloth.
Wax	Wax can be added with a cloth and then polished to give a protective finish. The finish is both aesthetic as well as functional.
Paint	Paints add colour as well as protection on wood based materials. Paint is added to manufactured boards to improve aesthetics. Paint should be added in thin layers: undercoat which is then followed by at least one top coat. Oil based paints are more durable. Acrylic paints dry quicker and are often non toxic (good for children's toys) Spray paints often give a better finish with no brush/roller marks.

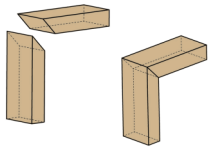
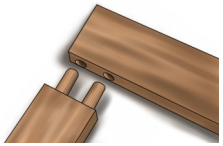
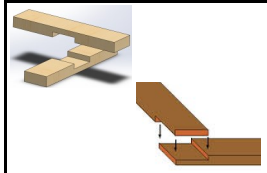
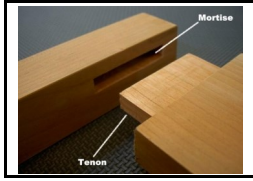
2 Joining wood based materials

PVA glue	Polyvinyl acetate. Joins wood to wood. Dries slowly.
Wood screws	Used to join timber together. They can be removed easily to take things apart. Usually made from steel. A = Pilot hole B = Clearance hole C= Countersink hole 
Butt hinge	Most widely used hinge. Allows two parts to be joined whilst still being able to move. These are recessed into the wood so the parts can close flush. **Uses include:** boxes, doors.
Piano hinge	Like a butt hinge but comes in one long length that you can cut to size.
Flush hinge	Like a butt hinge but do not need to be recessed. Easier to fit than a butt hinge but not as attractive.

3 Wood joints (box or drawer)

	**Butt joint.** These can be strengthened by adding nails.
	**Housing joint.** Can only be seen from one side. Good for adding base to box/drawer.
	**Finger joint.** Very strong as there is more surface area to glue. Hard to cut.
	Dovetail joint. Similar to a finger joint yet stronger due to angle of the cuts.

4 Wood joints (frame or stool/table)

	**Mitre joint.** Quite weak but looks attractive.
	**Dowel joint.** A butt joint with added dowel for strength.
	**Cross halving.** Also called corner halving if used on the corner.
	**Mortice & tenon.** Good strength but difficult to cut accurately.