INDUSTRIAL TECHNOLOGY

BUILDING TECHNOLOGY
LEVEL 9

Topic	Skills	Knowledge	Understanding	Attitude	Content	Methods/ Strategies	Materials	Evaluation	Area of Integration
Safety Health Welfare	Identify personal and general safety requirements Demonstrate correct safety practices in workshop.	Explain the importance for maintenance through safe cutting processes.	Develop the ability to recognize when tools need maintenance.	Develop the awareness how blunt tools perform.	List rules/ regulation procedures for specific rules and regulation in text books booklets, charts, diagrams, video tapes. Types of safety materials, tools equipment, gear accessories Types of accidents, injuries, procedures for treating shocks, wounds, injury to eyes.	Role-play and demonstration Group – discussion, illustrated lectures, guided practices, written work.	Posters and video tapes. Information booklets on First Aid. Manu-facturer's specificat-ions for use of equipment.	Prepare a list of general safety rules relating to: 1. body care 2. clothing 3. tools 4. materials 5. shop courtesy.	Woods First Aid.

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Special Hand Planes.	List the various types of special hand planes. Identify special hand planes. Demonstrate the use of each hand plane.	Explain the operations of each plane:- eg. block plane -combination plane -rebate plane -plough plane -router -shoulder plane -ball nose plane -compass plane.	Develop the ability to apply each special plane for its specific operation.	Develop an awareness that special hand planes are very helpful to the budding craftsmen.	The block plane is used on small pieces of work. It is also suitable for fitting mitres and for chamfering. Combination plane was design to perform the task as any special plane, this plane is able to do grooves, rebates, mouldings and tongues. Surform plane, unlike other planes have multi-tooth plates. The rebate plane is used for cutting rebates along edges of timber. The plough plane is used for cutting grooves. The text books will give more details on description and use of special plane.	Illustrated lecturers guided practices sketches of each plane Written work Practical demonstration of each available tool.	Posters and video tapes. Information booklets on tools. Text books:- Industrial Arts for Secondary Schools BKII Theory and Practice by George Love.	1. List about four types of special hand planes. 2. Make sketch of a compass plane. 3. List the operations which a combination plane can be used to do.	Woods Mathematics

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Manu-factured Boards.	1. Identify manufactured boards 2.Explain the pro-cedures of producing manu-factured board e.g. steaming, peeling or slicing, drying, assembling. Explain the advantages of manu-factured boards.	List the various types of manufactured boards. Identify the methods of timber products e.g. the cutting of veneers. List the various types of manufactured boards.	Develop the ability to recognize manufactured boards.	Develop the awareness to distinguish different types of manu-factured boards.	The greatest strength in solid timber is along the grain, and this fact is utilized in plywood which is made up of alternate layers of veneer cemented together at right angles to each other. It is relatively stable under varying conditions of temperature and humidity, and if bonded with certain synthetic glues, is resistant to boiling water and attacks from micro-organisms. Plywood is also highly resistant to splitting and can be successfully nailed and screwed near edges. It can also be sent without damage especially the veneers of equal thickness.	Illustrated lectures Written work Field trip to plywood factory Video tapes.	Text: Wood Work Techniques by J. Maynard Industrial Arts for Secondary Schools BK. 3 Theory and Practice of Wood Work by George Love Different pieces of manufacture boards.	List two advantages of using plywood. List the different types of manufacture d board List the manufacture d boards.	Science Mathematics Woods.

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					Types of manufactured boards are:- Plywood Blockboard Hardboard Laminboard Sizes/grades.			

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Adhesive	Define the term adhesive. List and describe the various types of glue and what they consist of. Discuss and demon-strate the procedure in the use of adhesives.	Identify the factors that affect glue. List the main kinds of glues used in joinery workshops today. Why it is necessary to remove excess glue from job.	Develop the ability to identify the advantages of epoxy resin over urea-formaldehyde glue.	Develop the awareness to recognize which is the best glue that does not require any special condition for application.	Adhesives – Materials or substances which have the property to stick or bind materials together. Kinds of glues - The three main kinds of glue in everyday use in joinery workshop are:- 1. animal glue 2. casein glue 3. synthetic glue. Preparation of each kind of glue. What each is made from. Other adhesives e.g contact cement. The advantages of each type of glue.	Illustrated lectures, Demonstration, written work.	Text Books Industrial Arts for Secondary Schools BK III. Theory and Practice of Woodwork by George Love.	Explain the procedures in the preparation of the following adhesives a) animal glue b) casein glue c) synthetic resin glues.	Science Woods Home Economics

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Abrasives	Explain what is an abrasive and what is its composition.	Identify the forms of abrasives.	Develop the ability to identify the grade of an abrasive.	Develop an awareness of the correct way that abrasives should be rubbed.	Abrasive scrapes away material by rubbing. Abrasives are made in various grades to produce surfaces varying from rough to smooth. Raw materials:- Abrasives for smoothing wood work are available in sheets. These abrasives are composed of two parts:- 1. the backing 2.the frit forms of abrasives - rolls and cut into sheets. Grades of abrasives:- Abrasives are used manually or with power tools.	Demonstration of manual and power tools correctly used.	Industrial Arts for Secondary Schools BK III Theory and Practice of Woodwork by George Love.	Explain how the grade of an abrasive is identified. Explain why it is important to sand it with the grain.	Science Home Economics

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Planning and estimating for project..	Sketch a working drawing. Identify dimension of all parts of project. Preparation of estimate. Calculation of board measurement for project.	Identify – model and or sketch for project. Make a list of materials needed. Make a list of tools.	Develop the ability to recognize the need for a small percentage of extra material for wastage.	Develop an awareness of the difference between an estimate and a material list.	Planning helps you to get more work done in a shorter time. Planning includes selecting a project and out lining the procedures. Every project requires certain amounts of different materials for its completion. The preparation of the quantities of the various materials, description rough sizes and expected cost is identified as an estimate. Preparing a working drawing is necessary; also a model of the job can be of great assistance.	Discussion and illustrated lecturers. Guide practices. Demonstration of a material list	General Industrial Education Los Angles United School District.	Explain why planning is necessary. What allowances should be made when preparing an estimate?	Measurement (metric system) Woods Technical Drawing.

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					Preparing a job is also important and being able to calculate board measurement will assist the wood worker greatly.				

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Upholstery	-Identify tools used for upholstery -identify suitable materials for specific job -select proper kind of lumber, layout frames -assemble frames -determine amount of webbing to be used tack and stretch webbing -apply padding and covering.	-List basic hand tools -sketch and label upholstery tools.	Develop the ability to identify and explain the use of each upholstery tools.	Develop an aware-ness to appreciate the need for upholstery skills.	Tools used for upholstery are:- the magnetic tack hammer, the regulator, the double-pointed straight needle,, the webbing stretcher, the fabric shears and the tack claw. - Description and sketches of each tool. - the function of each tool - upholstering materials: webbing, burlap (their sources and manufacturer) -kinds of timber suitable for frame construction - procedures used for determining size of covers.	Questioning Guided discussion and illustrated lectures Video tape Guide practices and demonstratio n of simple upholstery (drop-in seat using polyether foam) Trips to furniture factory.	Text: Woodwork, Designing, Construction and Workshop Practice *J. Maynard D.A. Jones* Work drawing materials:- foam, plywood base, tacks, tools, etc.	1. List basic tools for upholstery construction 2. Make a simple drop-in upholstery seat for stool 3.What is the advantage of using webbing instead of a solid board of the foundation of a slipframe seat?	Woods Mathematics Needle Craft

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Machines and portable power tools, use , care and maintenance.	List and identify a) machines b) portable power tools.	The advantages of machine tools in production of work.	Develop the ability to observe safety rules when working with machine tools.	Develop an awareness to cultivate safety and care when using electric power tools.	Machine tools depend mainly on electric current to drive them. They have the disadvantage of mass production. Power tools are divided into two groups:- -floor model -table model They each have advantages and disadvantages. However, they can greatly enhance the efficiency of a woodwork shop. Types of machine tools are:- Circular saw, band saw, jig saw, jointer, thickness planer, mortiser, wood turning lathe, drill press,	Discussion, questioning, illustrated lectures, demonstration of its operation, guided practices.	Information booklets from manufactures text:- Industrial Arts for Secondary Schools BK III.	List the various types of power machines. 1.Explain the use of each 2.Draw a diagram of a circular saw and name its parts 4.Explain five safety rules when using an electric planer.	Woods Mathematics Home Economics

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					Grinders, portable electric power tools: - safety procedures for each tool identified - the operations, their parts - sketching and labeling part of power tools.				

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Sharpen-ing tools	Identify two operations in sharpening Define the following terms: - grinding - honing Explain why sharpening of tools is an important operation. Identify and demonstrate the angles of grinding and honing.	List the tools that have cutting blades eg. planes chisels List the steps in: a) grinding b) sharpening Identify the angles of a) grinding b) honing Identify the burr.	Develop the ability to recognize that apart from general maintenance, the most important aspect is in the preparation and preservation of good cutting edges. Develop the ability to prevent damages to edged tools by keeping bench cleared of tools not in use. Develop the ability to sketch a working drawing of project.	Develop the awareness that when edged tools get into contact with other pieces of metal, eg. nails screws etc. they will spoil all the preparation done to the edges before.	Importance of good tool maintenance is very essential to the wood worker, since apart from their general cleanliness, rust prevention and avoidance of damage through handling, the most important aspect is in the preparation and preservation of good edges. Most cutting tools have blades which require two operations to sharpen them. Those operations are grinding and honing. For grinding, the angle is from 20^{o} to 25^{o}, while honing the angle is from 25^{o} to 30^{o}. Grinding is done on an abrasive wheel, while honing is done on an oil stone.	Questioning Guide Discussion Illustrated lecturers and demonstration Guide practices Video tape.	Text – Theory and Practice of Woodwork by George Love.	Identify and demonstrate the angles of: a) grinding b) honing.	Geometry Metals

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Furniture construct lon.	Make furniture using mortice and tenon joints – eg. stools, tables and chairs.	-Prepare a cutting list. State method of fixing component parts such as rails, legs and tops. -Prepare a cutting list -Identify suitable material -Identify different types of dove tail joints -Identify different types of housed joints.	Develop the ability to sketch a marking drawing of project.	Develop the awareness of creativity in furniture construction.	Practical – Prepare stock, layout mortice and tenton joints, cut mortice and tenton joint, turn legs, assemble parts, glue legs and rail, fix top, sand surfaces and apply finish. - Prepare material for chest of drawers/desk. - Assemble carcase, position and secure drawer guides, layout and cut dovetail joints for drawer front, assemble and fit, sand surfaces and apply finishes, fit hardware – handles, locks.	Practical work, layouts, sawing, chiseling, planing, sanding, gluing, finishing. Observe safety practices.	Tools: plane, chisel, wallet, marking – gauge tape, glue, lacquer brush etc. Stock.	Make mortice and tenon joint within specified time.	Technical Drawing Applied Calculation Safety Health

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Drawing and Designing	Draw free hand the specific design of project Identify the basic principles of design 1. function/ purpose 2. form and proportion 3. construct-ion 4.materials	Identify the difference between free hand drawing and drawing using Instruments. List two factors that are important in the design function.	Develop the ability to create some project of his own design. Develop the ability to involve the principles of designing in his creativity.	Develop an awareness to appreciate and assess the aesthetic values of well designed articles around him.	The basic principles of design fall into distinct groupings:- 1. The function or fitness for purpose 2. Form and proportion in satisfying harmony 3. Sound construction 4. Materials and embellishments. Designing a coffee table – this involves a succession of sketches until one arrives at a form of satisfaction. These drawings bring out: 1. free hand sketches 2. self expression.	Illustrate lectures Demonstrat-ion Guide practices of free hand sketches	Text: Theory and Practice of Woodwork by George Love. Woodwork, Designing Construction and Workshop Practices: J. Maynard and D. Jones	Explain two principles that are important under designs.	Woods Freehand Drawing Technical Drawing

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Introduction to Computers	-Identify the different parts that make up a computer system -List the various types computers: Operate the computer using good operating procedures Perform simple tasks.	List the many uses of computer in the industry Define the various terminologies.	Develop the ability to appreciate the function of computers.	Develop an awareness of the things that the computer can do for technology eg. drawings, storing information accurately.	A computer is a device which will accept input data, process it according to programmed logical to logical arithmetic rules, store and out put data and/or calculate results. A computer is therefore a mixture of physical, tangible things like key boards, mouse, screen, circuit and cables (hard ware) and intangible arithmetic and logic (software) using electrical impulses, the two are connected and communicate with each other.	Illustrated lectures Demonstrat-ion	Computers, Computer guides for use.	How does a computer process data? Define hardware Listen input Devices. What is RAM? How much can be stored on CD-ROM?	Mathematics Science

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Career Opportun-ties	List Career opportunities in the following fields: a) Woods b) Metals c) electricity d) drafting.	Explain the function of each stage.	Develop the ability to identify future career at an early stage.	Develop an appreciation for technical skills.	**Woods** - carpenter, cabinet makers, pattern makers, foresters, researchers. **Metals** - machinist, welders instrument makers, tool and die makers, sheet metal workers. **Electricity** - elecrician, electronic technican **Drafting** -architectural draft person, electrical draft person, industrial designer, mechanical technical illustrator draft person.	Guided discussion Video tape Field tri ps.	Texts:- General Industrial Education – Los Angeles United School District.	List three careers from the following: 1. drafting 2. woods 3. electrical	Drawing Mathematics Research Science
