

K to 12 TECHNOLOGY AND LIVELIHOOD EDUCATION

**INDUSTRIAL ARTS - PLUMBING
(Exploratory)**

Content Standard	Performance Standard	Learning Competencies	Project/ Activities	Assessment	Duration
LESSON 1: PREPARE PLUMBING MATERIALS AND TOOLS					
<p><i>Demonstrate understanding of/on:</i></p> <ul style="list-style-type: none"> • Types and uses of plumbing materials • Types of plumbing tools and their uses • Description of materials and tools • List of materials per company standards 	<ol style="list-style-type: none"> 1. Tools and materials are identified per job requirements. 2. Tools are classified according to their functions per job requirements. 3. Materials are classified according to their uses in a specific construction project. 4. Tools and materials are selected per job requirements. 	<p>LO1. Identify materials and tools applicable to a specific plumbing work</p>	<ol style="list-style-type: none"> 1. Listing down the tools needed in plumbing 2. Demonstrating/ illustrating how to use some plumbing tools used in plumbing. 	<ul style="list-style-type: none"> • Written test • Performance test 	<p>4 hours</p>
<p>Different forms like:</p> <ul style="list-style-type: none"> • Job order slip • Tools and materials requisition slip • Borrower's slip 	<ol style="list-style-type: none"> 1. Needed materials and tools are listed per job requirement. 2. Materials and tools are requested according to the list prepared. 3. Requests are done per company's standard operating procedures (SOP). 4. Materials and tools are provided and unavailable ones are substituted without sacrificing cost and quality of work. 	<p>LO2. Request appropriate materials and tools.</p>	<ol style="list-style-type: none"> 1. Making a list of the different sizes of pipes. 	<ul style="list-style-type: none"> • Written test • Performance test 	<p>2 hours</p>

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<ul style="list-style-type: none"> • Procedure in receiving tools and materials • Proper inspection of tools and materials received • Proper handling of tools and materials 	<ol style="list-style-type: none"> 1. Materials and tools per quantity and specification are received and inspected based on requisition made. 2. Tools and materials are checked for damages and manufacturing defects. 3. Materials and tools received are handled with appropriate safety devices. 4. Materials and tools are stored appropriate location nearest the workplace. 	<p>LO3. Receive and inspect materials.</p>	<ol style="list-style-type: none"> 1. Enumerating some common defects and/or damages of tools and materials used in plumbing. 	<ul style="list-style-type: none"> • Written test • Performance test 	<p>3 hours</p>

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LESSON 2: PERFORMING MENSURATIONS AND CALCULATIONS					
<p><i>Demonstrate understanding of/on:</i></p> <ul style="list-style-type: none"> • Visualizing objects and shapes, specifically geometric shapes • Measuring instruments/ measuring tools • Proper handling of measuring instruments 	<ol style="list-style-type: none"> 1. Objects or components to be measured are identified, classified and interpreted according to the appropriate regular geometric shapes. 2. Measuring tools and instruments are selected according to job requirements. 3. Alternative measuring tools are used without sacrificing cost and quality of work. 	<p>LO1. Select measuring instruments</p>	<ol style="list-style-type: none"> 1. Measuring the sizes of pipes. 	<ul style="list-style-type: none"> • Written test • Performance test 	<p>3 hours</p>
<ul style="list-style-type: none"> • Mensuration • Kinds of measurement • Conversion of units of measures 	<ol style="list-style-type: none"> 1. Accurate measurements are obtained according to job requirements. 2. Measurement are identified and converted according to job requirements. 3. Work pieces are measured according to job requirements. 	<p>LO2. Carry out measurements and calculations</p>	<ol style="list-style-type: none"> 1. Converting measurement from English system to Metric system and vice versa. 	<ul style="list-style-type: none"> • Written test • Performance test 	<p>4 hours</p>

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LESSON 3: INTERPRETING TECHNICAL DRAWINGS AND PLANS					
<p><i>Demonstrate understanding of/on:</i></p> <ul style="list-style-type: none"> Drawing symbols and signs in plumbing Drawing lines 	<ol style="list-style-type: none"> Technical plans are obtained according to job requirements. Signs, symbols and data are determined according to classification or appropriateness. 	<p>LO1. Analyze signs, symbols, and data.</p>	<ol style="list-style-type: none"> Enumerating and describing the lines necessary in making working drawings. 	<ul style="list-style-type: none"> Written test Performance test 	<p>2 hours</p>
<ul style="list-style-type: none"> Identify tools and materials according to the plan 	<ol style="list-style-type: none"> Supplies and materials are listed according to specifications. Work plan is drawn following the specifications. 		<ol style="list-style-type: none"> Identifying tools and materials 	<ul style="list-style-type: none"> Written test Performance test 	
<ul style="list-style-type: none"> Basic technical drawing Technical plans and schematic diagram Symbols and abbreviations 	<ol style="list-style-type: none"> Dimensions and specifications are identified according to job requirements. Freehand sketch is produced in accordance with job requirements. 	<p>LO2. Perform freehand sketching.</p>	<ol style="list-style-type: none"> Making a sketch of a three feet pipe with two 90-degree elbows and one faucet. 	<ul style="list-style-type: none"> Written test Performance 	<p>3 hours</p>

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LESSON 4: MAINTAINING TOOLS AND EQUIPMENT					
<p><i>Demonstrate understanding of/on:</i></p> <ul style="list-style-type: none"> Types of plumbing tools and equipment Classification of functional and non-functional tools Uses of Personal Protective Equipment (PPE). 	<ol style="list-style-type: none"> Tools and equipment are identified according to classification specification, and job requirements. Functional and non-functional tools and equipment are segregated and labeled according to classification. Safety of tools and equipment are observed in accordance with manufacturer's instructions. Conditions of PPE are checked in accordance with manufacturer's instructions. 	<p>LO1. Check conditions of tools and equipment.</p>	<ol style="list-style-type: none"> Enumerating tools and equipment that need maintenance or repair 	<ul style="list-style-type: none"> Written test Performance test 	<p>5 hours</p>
<ul style="list-style-type: none"> Types and uses of lubricants Types and uses of cleaning materials/solvent Types and uses of measuring instruments and equipment. Preventive maintenance techniques and procedures. 	<ol style="list-style-type: none"> Lubricants are identified according to use. Tools and equipment are lubricated according to preventive maintenance procedure or manufacturer's specifications. Defective equipment and tools are inspected and replaced according to manufacturer's specifications. 	<p>LO2. Perform basic preventive maintenance.</p>	<ol style="list-style-type: none"> Explaining the importance of lubricants in tool and equipment maintenance 	<ul style="list-style-type: none"> Written test Performance 	<p>3 hours</p>

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<ul style="list-style-type: none"> OSHC workplace regulations 	<ol style="list-style-type: none"> Workplace is cleaned and kept in safe state in line with OSHC regulations. 				
<ul style="list-style-type: none"> Inventory of tools and equipment Tools and equipment handling Tool safe-keeping/storage 	<ol style="list-style-type: none"> Inventory of tools, instruments, and equipment are conducted and recorded per company practices. Tools are inspected and stored after use. Tools and equipment are stored safely in accordance with manufacturer's specifications or company procedures. 	LO3. Store tools and equipment.	<ol style="list-style-type: none"> Compiling the disadvantages of improper storing of tools and equipment in an album with examples or visuals. 	<ul style="list-style-type: none"> Written test Performance test 	2 hours

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LESSON 5: PRACTICING OCCUPATIONAL HEALTH AND SAFETY PROCEDURES					
<p><i>Demonstrate understanding of/on:</i></p> <ul style="list-style-type: none"> • TLV table • Philippine OHS standards • Effects of hazards in the workplace • Ergonomics • ECC regulations 	<ol style="list-style-type: none"> 1. Terms of maximum tolerable limits are identified based on threshold limit value (TLV). 2. Effects of hazards are determined. 3. OHS issues and concerns are identified in accordance with workplace requirements and relevant workplace OHS legislation. 	LO1. Evaluate hazards and risks	<ol style="list-style-type: none"> 1. Making a list of known hazards and risks in the workplace. 	<ul style="list-style-type: none"> • Written test • Performance test 	2 hours
<ul style="list-style-type: none"> • Safety regulations • Clean Air Act • Electrical and fire safety code • Waste management • Disaster preparedness and management • Contingency measures and procedures 	<ol style="list-style-type: none"> 1. OHS procedures for controlling hazards and risks are strictly followed. 2. Procedure in dealing with workplace accidents, fire, and emergencies are followed in accordance with the organization's OHS policies. 3. Personal protective equipment (PPE) is correctly used in accordance with organization's OHS procedures and practices. 4. Procedure in providing appropriate assistance in the event of workplace 	LO2. Control hazards and risks	<ol style="list-style-type: none"> 1. Demonstrating or illustrating the proper use of PPE. 	<ul style="list-style-type: none"> • Written examination • Performance Test 	2 hours

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	emergencies are identified in line with the established organizational protocol.				
<ul style="list-style-type: none"> • Operational health and safety procedures, practices, and regulations • Emergency-related drills and training 	<ol style="list-style-type: none"> 1. Procedures in emergency related drills are strictly followed in line with established organizational guidelines and procedures. 2. OHS personal records are accomplished in accordance with workplace requirements. 3. PPE is used and maintained in line with organizational guidelines and procedures. 	LO3. Maintain occupational health and safety awareness.	1. Reporting on the emergency drills (fire and earthquake) undertaken in the schools.	<ul style="list-style-type: none"> • Written test • Performance test 	4 hours
					40 hrs.