

7

Lesson Exemplar for TLE

Quarter 4

Lesson

5

Lesson Exemplar for TLE Grade 7
Quarter 4: Lesson 5 (Week 5)
SY 2024-2025

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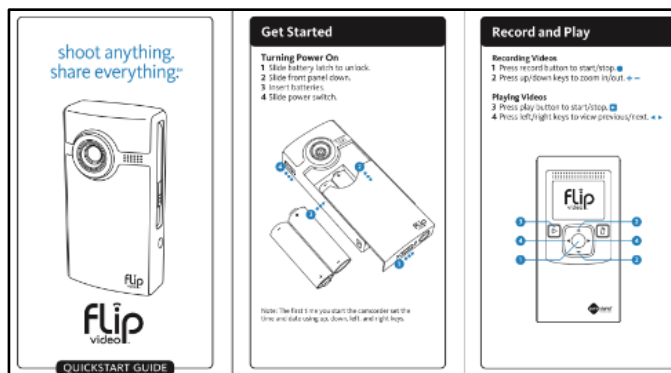
TLE /QUARTER 4/ GRADE 7

I. CONTENT, STANDARDS, AND LESSON COMPETENCIES	
A. Content Standards	The learners demonstrate an understanding of the uses and maintenance of hand tools, power tools, instruments, and equipment.
B. Performance Standards	The learners perform mensuration and calculations following safety precautions
C. Learning Competencies and Objectives	Learning Competency Identify the uses and maintenance of hand tools, power tools, instruments, and equipment. Learning Objectives At the end of the lesson, the students are expected to: 1. Identify types of manuals 2. Enumerate the methods and techniques in preventive maintenance 3. Practice the methods and techniques in preventive maintenance
D. Content	Maintain Tools and Equipment
E. Integration	The 5S Pillars Hazard and Risks in the Workplace

II. LEARNING RESOURCES
Cunanan, R.C. (n.d.). K to 12 Basic Education Curriculum TLE Learning Module Santelices, D.R. (n.d.). K to 12 Basic Education Curriculum TLE Learning Module Tan, M.E. (n.d.). K to 12 Basic Education Curriculum TLE Learning Module

III. TEACHING AND LEARNING PROCEDURE	NOTES TO TEACHERS
A. Activating Prior Knowledge	DAY 1 1. Short Review Let the students identify the following tools according to their classification. 1.  _A_ON_Y _OO_S 2.  C_R_EN_RY T_OL_ 3.  P_UM_I_G T_OL_ 4.  _LE_TR_CA_ T_O_LS 5.  C_NS_RU_TI_N P_IN_ING_ T_OL_
B. Establishing Lesson Purpose	1. Lesson Purpose The teacher will ask the students with the following questions: The teacher may also share the video on Tools Story.

	1. What are the different classifications of tools? 2. Are you familiar with using those kinds of tools? 3. If you are not familiar with using those kinds of tools, what resources, would you rely on? 4. What are some essential steps or practices for properly maintaining and caring for tools to ensure their longevity and effectiveness? 2. Unlocking Content Vocabulary • Maintenance- refers to the process of preserving or restoring something to its desired condition. • Tightening- the act of making something tighter or more secure. • Hazard- any source of potential harm or adverse health effect on people, property, or the environment. • Adjustment- a change or modification made to something in order to improve its function. • Troubleshoot- to identify and solve problems or issues that arise in a system, device, process or situation.	<i>Tool story (2003) SYF gold award 2005. (2010, June 11).</i> YouTube. https://youtu.be/QWF_LaL6k08?si=EU8tOwpdwVdd4ieW
C. Developing and Deepening Understanding	Maintain Tools and Equipment SUB-TOPIC 1: Types of Manuals 1. Explicitation In industrial arts services, various types of manuals are utilized to provide guidance, instruction, and information related to different aspects of the industrial arts field. Here are some common types of manuals found in industrial arts services: 1. Instruction Manuals: These provide step-by-step guidance on how to operate machinery, tools, or equipment safely and efficiently. Instruction manuals often include diagrams, illustrations, and troubleshooting tips.	The teacher may integrate in this part the types of hazard and risks in the workplace. <i>7 types of workplace safety hazards. (2023, January 11). SafetyLine Lone Worker Leaders in Work Alone Safety Monitoring. https://safetylineloneworker.com/blog/workplace-hazards# Hazards (safetylineloneworker.com)</i>



Source: https://www.iwk.com.my/cms/upload_files/sewerageforms/sewerageforms_file_000007.pdf

2. Safety Manuals: Safety manuals outline safety protocols, procedures, and guidelines to ensure a safe working environment within industrial settings. They typically cover topics such as hazard identification, personal protective equipment (PPE), emergency procedures, and accident reporting.

Source: <https://studylib.net/doc/9957597/safety-manual>

MESSA
SDN BHD

SAFETY MANUAL

INTRODUCTION

1. This safety manual defines MESSA Construction Sdn. Bhd. safety policy and safety objective, responsibility and authority for safety itself, procedures and instruction that are applicable.
2. SAFETY shall also mean "OCCUPATIONAL HEALTH" where applicable.
3. The following reference are use in preparing this manual :
 - Occupational Safety and health ACT 514 / 1994
 - Factory And Machinery Act 139 / 1967
 - Industrial code by defines by ACTS
4. All MESSA Construction Sdn. Bhd. employees and sub-contractors' employees shall comply with the safety policy, relevant safety procedures and instructions to ensure that safety of all persons at work is care for at all times.
5. All customers and visitors shall also observe safety and comply with relevant safety procedures and instructions.

3. Maintenance Manuals: Maintenance manuals detail the procedures for inspecting, servicing, and maintaining machinery and equipment to ensure optimal performance and longevity. They often include schedules for routine maintenance tasks, troubleshooting procedures, and parts replacement instructions.

4. Operations Manuals: Operations manuals provide comprehensive information on the overall operations of an industrial facility or process. They may cover topics such as production workflows, equipment utilization, scheduling, and resource management.

Content for Operation and Maintenance Manuals	
Table of content for Operations & Manuals	
Process, Operation, Maintenance, Installation and Trouble-Shooting	
This sample outline is intended as a guide to be used when developing an O&M manual. Use of this sample outline will facilitate the development, review and approval of the O&M manual. However, all aspects of the sample outline may not be relevant for all facilities.	
Volume I : Operation	
Item	Description
1	Introduction
1.1	Observations and View of Development
1.2	Observations and Status of Existing Treatment Facilities (Existed Plants)
1.3	Schedule of Site
1.4	Chain of Command System
1.5	Effluent Quality
2	Process Description
2.1	General Process View
2.2	System Description
2.2.1	Physical Treatment Process
2.2.2	Chemical Treatment Process
2.2.3	Biological Treatment Process
3	Design Calculations
3.1	General Design Information
3.2	Details of Design Calculations
4	Treatment Plant Operation
4.1	Initial Start up Procedure
4.2	Feeding & Controlling
4.3	Procedure for Operating Plant Commenced to Begin or Phases
4.4	Plant Shutdown Procedure
5	Schedule of Equipment
5.1	Main Mechanical & Electrical Equipment
5.2	Pipes, Valves & Fittings, Instrumentation
6	Unit Process Trouble-shooting & Investigation
6.1	Anticipated Problems & Investigation Works
6.2	Causes of Process Deviation & Non-Compliance of Effluent Quality
6.3	Recommended Corrective Action
6.4	Description of the appropriate response or adjustment to maintain impact of emergency situations with the potential to affect the discharge or compliance with the permit
6.5	Periodic Maintenance Procedures for the unit process
6.6	Details on how inspections will be conducted and a schedule for the inspection of collection systems and pump stations, where applicable
6.7	Inspection checklist
6.8	Record Keeping
6.8.1	Date of entry, inspection observations, maintenance performed
6.8.2	Process efficiency monitoring results
6.8.3	Observing cost results and recommendations
7	Monitoring Process Efficiency
7.1	Monitoring programme
7.2	Sample containers used to perform tests, sample locations, collection and handling
7.3	Effluent sampling lab protocol for in house testing or reference to off site laboratory. Sampling and analysis manual
8	Safety & Health
8.1	Safety Measures
8.2	Stress Control
8.3	Table Content

5. Quality Assurance Manuals: Quality assurance manuals outline the standards, processes, and procedures for maintaining product quality and consistency. They may include information on quality control methods, inspection procedures, and documentation requirements.

Source: <https://www.quality-assurance-solutions.com/OA-Manual-ISO-9001-2015.html>

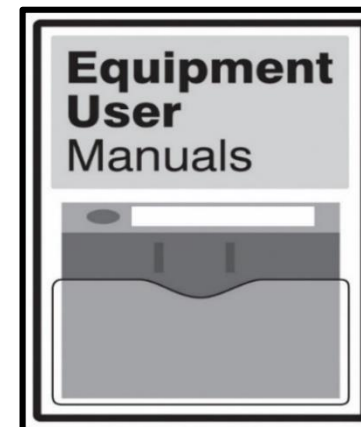
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6. Training Manuals: Training manuals are used to educate personnel on various aspects of industrial arts, such as manufacturing processes, quality control standards, and safety protocols. They may include instructional materials, exercises, and assessments to facilitate learning.

Source: <https://www.spencerprint.com.au/wp-content/uploads/2017/02/How-to-design-a-great-training-manual.jpg>

Introduction 1.0	Page 2
Unit Summary 1.0	Page 4
Method of Supply 1.0	Page 5
Objectives 2.0	Page 7
Course Summary 2.0	Page 8
Health Hazards 2.0	Page 10
Cost Summary and Formulae 2.1	Page 10
Effect of Color on the Lamp 2.2	Page 11
Experiments 2.3	Page 11
Formulation of Melt 2.3.4	Page 11
Formulation 2.3.5	Page 11
Preventive Coating 2.4	Page 11
Safety Distance 2.5	Page 11

7. Equipment Manuals: Equipment manuals provide detailed information about specific pieces of machinery or equipment, including specifications, operating instructions, maintenance requirements, and troubleshooting tips.



2. Worked Example

Read the statement carefully and identify what is being described or defined. Choose your answer from the words inside the box.

Maintenance	Instruction	Operations
Safety		Equipment

1. Manuals that detail the procedures for inspecting, servicing, and maintaining machinery and equipment to ensure optimal performance and longevity.
2. These manuals provide step-by-step guidance on how to operate machinery, tools, or equipment safely and efficiently.
3. Manuals that provide detailed information about specific pieces of machinery or equipment, including specifications, operating instructions, maintenance requirements, and troubleshooting tips.
4. Manuals that outline safety protocols, procedures, and guidelines to ensure a safe working environment within industrial settings.
5. Manuals that provide comprehensive information on the overall operations of an industrial facility or process.

3. Lesson Activity

Situational Analysis: Manuals in Action

Ask students to divide the class into three groups. Provide each group with one scenario to analyze. Instruct groups to discuss the scenario and determine which type of manual would be most appropriate to address the situation. Encourage groups to consider the specific needs and challenges presented in the scenario and how each type of manual could help address them.

Scenario:

In a manufacturing facility, a new piece of equipment has been installed to automate a particular production process. However, the operators are unfamiliar with the operation and maintenance procedures for the equipment, leading to frequent breakdowns and delays in production.

Question: Which type of manual would be most helpful in this situation, and how would it address the problem?

Answer key:

1. Maintenance
2. Instructions
3. Equipment
4. Safety
5. Operations

Answer key:

The most appropriate type of manual for this scenario would be an "Operation Manual" for the equipment. An Operation Manual provides detailed instructions on how to operate the equipment safely and efficiently, including startup procedures, operational controls, and shutdown procedures. Additionally, it may include troubleshooting tips and maintenance guidelines to

DAY 2

SUB-TOPIC 2: Methods and Techniques in Preventive Maintenance

1. Explicitation

Performing basic preventive maintenance is one of the most important routines in a workplace. Through this, the lifespan of tools and equipment will increase and they can be used for longer period of time.

Common Methods and Techniques Used in Preventive Maintenance:

1. **Scheduled Maintenance:** Establishing a regular maintenance schedule based on equipment manufacturer recommendations, historical performance data, and industry best practices. Scheduled maintenance tasks are performed at predetermined intervals (e.g., daily, weekly, monthly) to inspect, clean, lubricate, adjust, or replace components as needed.
2. **Tightening and Adjustment:** Checking and tightening loose fasteners, bolts, nuts, belts, chains, and other mechanical components to prevent excessive movement, misalignment, or loss of tension. Proper adjustment of equipment settings and controls ensures optimal performance and prevents premature wear or damage.
3. **Inspections:** Conducting routine visual inspections of equipment to identify any signs of damage, wear, or deterioration. Inspections involve checking for loose or worn parts, leaks, unusual noises, vibrations, or any other abnormalities that may indicate potential issues.
4. **Lubrication Management:** Implementing a systematic lubrication program to ensure that equipment components are properly lubricated to reduce friction, minimize wear, and extend service life. This involves using the correct type and quantity of lubricants and following recommended lubrication schedules.
5. **Cleaning and Housekeeping:** Maintaining a clean and organized work environment to prevent contaminants, debris, or foreign objects from interfering with equipment operation. Regular cleaning of equipment

ensure optimal performance and prevent breakdowns. Providing the operators with an Operation Manual would empower them with the knowledge and guidance needed to operate the equipment effectively, minimize downtime, and improve overall productivity in the facility.

The teacher may have a brief discussion about the 5S Pillars. *Lean thinking and methods - 5S | US EPA.* (2022, October 31). US EPA. <https://www.epa.gov/sustainability/lean-thinking-and-methods-5s>

	surfaces, air intakes, filters, and cooling systems helps prevent overheating and component damage. DAY 3 2. Worked Example: Hand Tools Maintenance Workshop (See worksheet #2 for the activity which students will accomplish.) The students will conduct a maintenance activity on the given hand tools with the following guide questions: 1. What will you do if a hand tool is damaged due to misuse? 2. You are working in an untidy workstation, what will you do? 3. Lesson Activity: Matching Type Match Column A with that of Column B. Write only the letter of the correct answer on your answer sheet. (See worksheet #2 V. Synthesis/Extended Practice/Differentiation for the activity which students will accomplish.) <table><tr><th>Column A</th><th>Column B</th></tr><tr><td>1. Establishing a regular maintenance schedule</td><td>A. Scheduled Maintenance</td></tr><tr><td>2. Maintaining a clean and organized work environment</td><td>B. Tightening and Adjustment</td></tr><tr><td>3. Conducting routine visual inspections of equipment</td><td>C. Inspection</td></tr><tr><td>4. Checking and tightening loose fasteners, bolts, nuts, belts, and chains</td><td>D. Lubrication Management</td></tr><tr><td>5. Implementing a systematic lubrication program</td><td>E. Cleaning and Housekeeping</td></tr></table>	Column A	Column B	1. Establishing a regular maintenance schedule	A. Scheduled Maintenance	2. Maintaining a clean and organized work environment	B. Tightening and Adjustment	3. Conducting routine visual inspections of equipment	C. Inspection	4. Checking and tightening loose fasteners, bolts, nuts, belts, and chains	D. Lubrication Management	5. Implementing a systematic lubrication program	E. Cleaning and Housekeeping	Day 3- Let the students accomplish the activities in Worked Example and Lesson Activity (2) Answer key: 1. Replacing just the tip by grinding or sharpening it to restore its functionality. 2. Use a file to smooth out any rough or uneven surfaces on the jaws. 3. Tighten or replace any loose or damaged fasteners securing the head to the handle. 4. Disassemble the tape measure to access the locking mechanism. 5. Use a file or grinder to carefully reshape and sharpen the edges of the wrench jaws. (3) Answer key: 1. A 2. E 3. C 4. B 5. D
Column A	Column B													
1. Establishing a regular maintenance schedule	A. Scheduled Maintenance													
2. Maintaining a clean and organized work environment	B. Tightening and Adjustment													
3. Conducting routine visual inspections of equipment	C. Inspection													
4. Checking and tightening loose fasteners, bolts, nuts, belts, and chains	D. Lubrication Management													
5. Implementing a systematic lubrication program	E. Cleaning and Housekeeping													
D. Making Generalizations	DAY 4 1. Learners’ Takeaways 1. Can you enumerate the different types of manuals? 2. What are the common methods and techniques used in preventive maintenance? 2. Reflection on Learning Have the students complete the following sentences: I understand that _____. I realize that _____. I need to learn more about _____.	Day 4- Learners’ Takeaways Reflection on Learning Formative Assessment												

IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER'S REFLECTION	NOTES TO TEACHERS
A. Evaluating Learning	1. Formative Assessment Multiple Choice Quiz: Students will answer the 5-item test about the types of manuals, methods, and techniques in preventive maintenance. 1. This type of manuals has the detail procedures for inspecting, servicing, and maintaining machinery and equipment to ensure optimal performance and longevity. a. Maintenance Manuals b. Safety Manuals c. Instruction Manuals d. Equipment Manuals 2. These manuals provide step-by-step guidance on how to operate machinery, tools, or equipment safely and efficiently. a. Maintenance Manuals b. Safety Manuals c. Instruction Manuals d. Equipment Manuals 3. Manuals that provide comprehensive information on the overall operations of an industrial facility or process. a. Maintenance Manuals b. Safety Manuals c. Instruction Manuals d. Operation Manuals 4. This is the checking and tightening of loose fasteners, bolts, nuts, belts and chains. a. Scheduled Maintenance b. Inspection c. Tightening and Adjustment d. Cleaning and Housekeeping 5. Establishing a regular maintenance schedule based on equipment manufacturer recommendations, historical performance data, and industry best practices. Answer key: 1. a 2. c 3. d 4. c. 5. a.

	a. Scheduled Maintenance b. Inspection c. Lubrication Management d. Cleaning and Housekeeping 2. Homework Directions: The students will visit a shop of his/her choice. Find out from the shop owner or worker how preventive maintenance of tools and equipment is done. Also, find out the problems met in implementing this mandatory requirement.			
B. Teacher's Remarks	<i>Note observations on any of the following areas:</i>	Effective Practices	Problems Encountered	The teacher may take note of some observations related to the effective practices and problems encountered after utilizing the different strategies, materials used, learner engagement and other related stuff. Teachers may also suggest ways to improve the different activities explored/ lesson exemplar.
	strategies explored			
	materials used			
	learner engagement/ interaction			
	others			
C. Teacher's Reflection	<i>Reflection guide or prompt can be on:</i> <u>Principles behind the teaching</u> What principles and beliefs informed my lesson? Why did I teach the lesson the way I did? <u>Students</u> What roles did my students play in my lesson? What did my students learn? How did they learn? <u>Ways forward</u> What could I have done differently? What can I explore in the next lesson?			Teacher's reflection in every lesson conducted/ facilitated is essential and necessary to improve practice. You may also consider this as an input for the LAC/Collab sessions.