



Ethiopian TVET-System



Irrigation & Drainage Construction

Level II

Based on, March 2017 G.C. Occupational Standard

Module Title: Standardizing and Sustaining 3S

TTLM Code: EIS IDC2 TTLM 0920v2



This module includes the following Learning Guides

LG1: Prepare for work

LG Code: EIS IDC2 M01 0920 LG-01

LG2: Standardize 3S

LG Code: EIS IDC2 M01 0920 LG-02

LG3: Sustain 3S

LG Code: EIS IDC2 M01 0920 LG-03

Instruction sheet-1	Learning Guide -1: Prepare for work
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This learning guide is developed to provide you the necessary information regarding the following content coverage and topics –

- Understanding concepts of Kaizen
- Using work instruction for job requirements
- Read and interpret Job specifications
- Identifying OHS requirements
- Preparing and using safety equipment and tools
- Identifying 3S tools and equipment

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to –

- Use work instructions to determine job requirements, including method, material and equipment.
- Read and interpret job specifications following working manual.
- Observe OHS requirements, including dust and fume collection, breathing apparatus and eye and ear personal protection needs throughout the work.
- Identify and check safety equipment and tools for safe and effective operation.
- Prepare and use tools and equipment to implement 3S

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below
3. Read the information written in the “Information Sheets 1,2,3,4,and 5”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks” in each information sheets on pages 10,17,25,28 and 32
5. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
6. Ensure you have a formative assessment and get a satisfactory result; Then proceed to the next LG.

Information Sheet-1	Understanding concepts of Kaizen
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1.1. Introduction to Kaizen

Kaizen is a Japanese philosophy for improvement that can be traced to the meaning of the Japanese words ‘Kai’ and ‘Zen’, which translate roughly into: ‘Kai’ - change, alter ‘zen’ - better, right.

The above two words combine to mean “change for better” or “Continuous improvement.” Kaizen means improvement, continuous improvement involving everyone in the organization from top management, to managers then to supervisors, and to workers. It is a philosophy of never being satisfied with what was accomplished last week, last year or last time. Kaizen as a management strategy has its characteristics. These are Kaizen has continuity, follows participatory approach, accumulation of small Improvement, applied using small investment and widely applicable.

To understand and successfully implement Kaizen the following Kaizen requisites should be fulfilled.

- Knowledge of Kaizen concepts and techniques is essential for doing Kaizen activities. Kaizen is easy to understand and should be started from the easy Kaizen techniques such as 5S and QC7 tools.
- Attitude with positive thinking is necessary for understanding and implementing Kaizen and Kaizen concept and techniques can also build positive attitude and can bring corporate culture.
- Involvement of all from top management to front-line workers: top management with commitment and interest on Kaizen, participation of all workers and establishment and involvement of cross-functional teams are essential for success and continuity of Kaizen.
- Zealous support for Kaizen: Kaizen needs zealous attention like support for one football team.
- Education about Kaizen (training): Kaizen is human-oriented i.e. it is implemented by employees therefore education or training about Kaizen is vital.
- Never-ending activity: Kaizen is continuous and practical, aiming always for best improvement through accumulation of small improvements.

1.2. Identifying elements of Kaizen

Improvement/change for the better and ongoing/continuity are the two elements that construct Kaizen. Absence of one of the elements would not be Kaizen.

The key elements of Kaizen are:

- Quality
- Effort
- Involvement of all employees
- Willingness to change and
- Communication

There are also five foundation elements of Kaizen:

- Teamwork
- Personal discipline
- Improved moral
- Quality circles and
- Suggestions for improvement

1.3. Identifying ways to improve Kaizen elements

Kaizen is the ongoing, systematic, incremental improvement in the way things are done. It is a relentless attempt to eliminate the unnecessary activities, delay, waste, and variation of business processes that add cost without adding value. Kaizen results in improved lead-time, efficiency, quality, productivity and customer loyalty.

"The goals of continuous improvement are simple: 1) make things easier 2) better 3) faster and 4) cheaper". It is the new "best solution"—from the customer's point of view (five customer types).

Below are ways to help the philosophy of Kaizen—Continuous Improvement—take hold in your organization.

- Involve Everyone – Kaizen is a strategy that involves every employee, from management to the cleaning crew.
- Challenge the Status Quo – Throw out all your old fixed ideas on how to do things. Avoid the emotional traps of blaming people or making excuses that prevent you from discovering the real problem. Once you have established the new best-way of doing something, stick with it until a better way is found.

- Get Specific –Asking “why” until you get to the root cause of the problem. Improve specific steps or components in your business systems and processes; there is no other way! Get defects to less than 1%.
- Start with yourself –Get connected with your numbers (leading and lagging indicators), and with customer, employee, and vendor feedback. Read skill-based business books and articles. Seek ways to improve your own personal performance, and encourage those around you to do the same.
- Keep It Simple and Inexpensive – Ideas for incremental improvements that bubble up from workers are usually easier to implement and less expensive. Follow the 80-20 Rule; do the twenty-percent of things that get you eighty-percent of improvement results. And do it NOW! Don’t wait until you can achieve perfection.
- Focus on the Right Things – Improve the core business systems that enable you to find and keep customers, and earn more money. Find ways to provide customers greater value and a better buying experience. Remember: quality plus speed equals low cost.
- Provide Training – Kaizen involves setting performance standards for your business systems and processes and then striving to elevate those standards. Continuous Improvement requires ongoing development of your most important asset.
- Look for Breakthroughs – Up to this point, we have focused on small incremental changes. However, Kaizen will sometimes produce breakthrough improvements.
- Never Stop Improving – Halt the process immediately to fix quality or customer-related problems. Don’t let problems accumulate for later handling. Reflect daily on your opportunities for improvement and innovation. Just one improvement a day is 260 improvements a year!

Kaizen (*Continuous Improvement*)

5 Principles



Figure 1: Five principles of continuous improvement

1.4. Understanding benefits of improving Kaizen elements

Kaizen aims for improvements in productivity, effectiveness, safety, and waste reduction, and those who follow the approach often find a whole lot more in return:

- Less waste – inventory is used more efficiently as are employee skills.
- People are more satisfied – they have a direct impact on the way things are done.
- Improved commitment – team members have more of a stake in their job and are more inclined to commit to doing a good job.
- Improved retention – satisfied and engaged people are more likely to stay.
- Improved competitiveness – increases in efficiency tend to contribute to lower costs and higher quality products.
- Improved consumer satisfaction – coming from higher quality products with fewer faults.
- Improved problem solving – looking at processes from a solutions perspective allows employees to solve problems continuously.
- Improved teams – working together to solve problems helps build and strengthen existing teams.

1.5. Understanding the fourth pillar of 5S

5S is based on five basic principles or “Pillars”. Those principles are:

- The First Pillar: Sort
- The Second Pillar: Set in Order
- The Third Pillar: Shine
- The Fourth Pillar: Standardize
- The Fifth Pillar: Sustain
 - ✓ Sort – Sort means that you remove all items from the workplace that are not needed for current production operations. The intent of Sort is to start fresh. Take a step back and review the work site for all unneeded materials, supplies and inventory.
 - ✓ Set in Order – Set In Order can be defined as arranging needed items so that they are easy to use and labeling them so that they are easy to find and put away. Set In Order should always be implemented with Sort.
 - ✓ Shine – The third pillar is Shine. Shine basically means keep clean. Much inefficiency and cost occur because of machinery or equipment accumulating dirt. This impacts its operations and sometimes causes unnecessary repair or maintenance which reduces productivity through increase machinery downtime (One of the 8 deadly wastes.)
 - ✓ Standardize – Standardize differs from Sort, Set in Place and Shine. These first three pillars can be thought of as activities. In contrast, standardize (the 4th pillar) is the method you use to maintain the first three pillars.
 - ✓ Sustain – Sustain means making a habit of properly maintaining correct procedures. Without the Sustain pillar, the first four pillars will not last very long.

1.6. Analyzing and preparing shop layout of the workplace

Layout planning is deciding on the best physical arrangement of all resources that consume space within a facility. These resources might include a desk, a work center, a cabinet, a person, an entire office, or even a department. Decisions about the arrangement of resources in a business are not made only when a new facility is being designed; they are made any time there is a change in the arrangement of resources, such as a new worker being added, a machine being moved, or a change in procedure being implemented. Also, layout planning is performed any time there is an expansion in the facility or a space reduction.

There are two general objectives which layout planners should seek to meet through careful organization of the site for construction:

- First, the site must be designed to maximize efficiency of operations in order to promote worker productivity, to shorten project time and to reduce cost.
- Second, the final plan must create a project with a good work environment in order to attract and retain the best personnel and thus contribute to better work quality and productivity.

The following are items to consider:

- Flooring
- Building framework
- Building height
- Roof trusses
- Building cladding
- Material storage
- Access
- Movement
- Machinery and equipment
- Covered space

In the absence of a precise work shop layout plan, the following problems may occur:

- Material stacks wrongly located
- Plant and equipment wrongly located
- Inadequate space allowed
- Site huts wrongly located in relation to their effective use

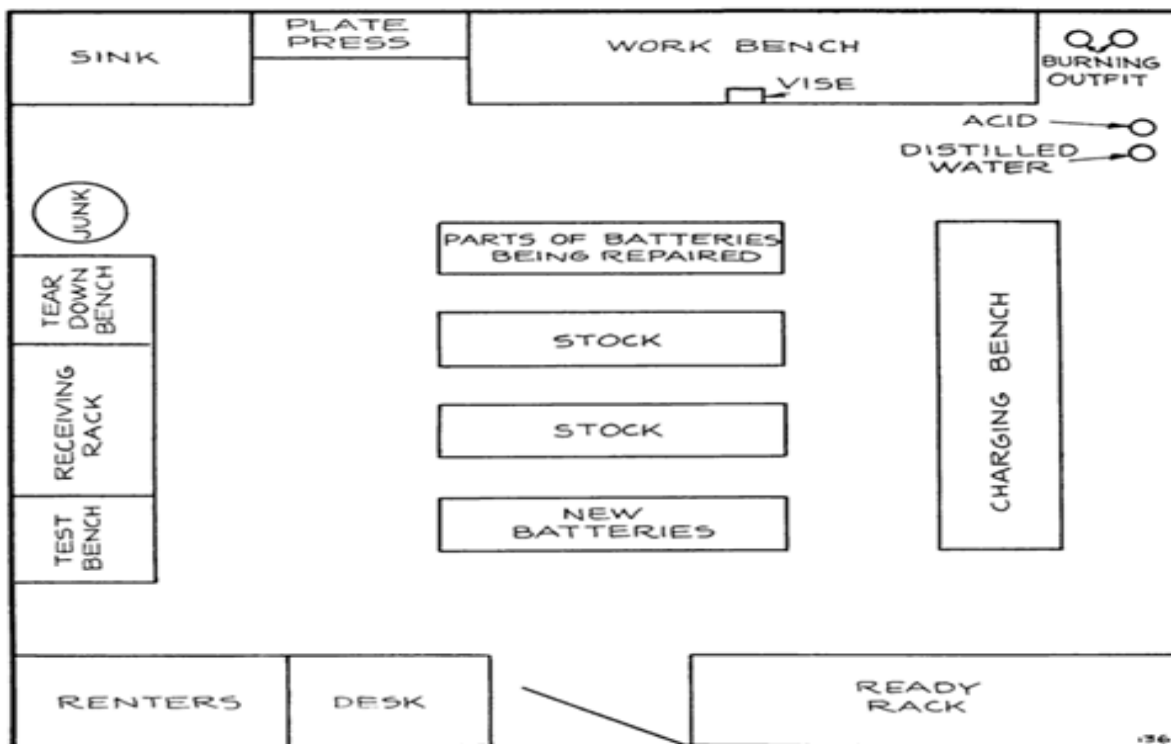


Figure 2: Sample work shop layout

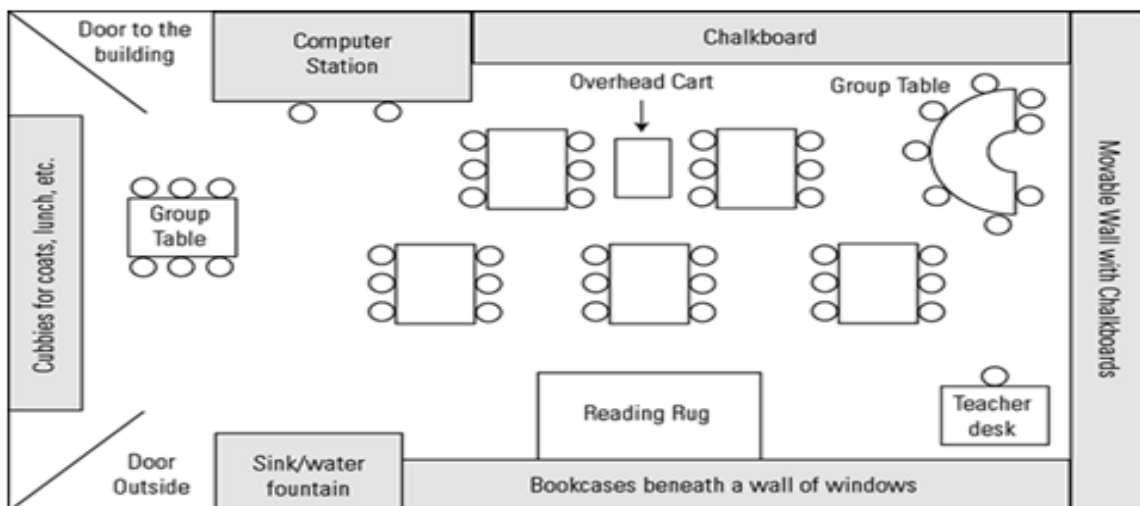


Figure 3: Sample work shop layout

Self-Check-1	Written test
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Name: _____ ID: _____ Date: _____

Direction I: Multiple choice questions

Instruction: Choice the best answer from the given alternative and write your answer on the answer sheet provided in the next page (2 point each)

- One of the following is an element of kaizen
 - Team work
 - Quality
 - Personal discipline
 - Improved moral
- One of the following is foundation elements of Kaizen
 - Team work
 - Quality
 - Effort
 - Willingness to change
- It is the 4th pillar of 5S
 - Sort
 - Set in order
 - Standardize
 - Shine
- One of the following is benefits of improving Kaizen elements
 - People are more satisfied
 - Improved commitment
 - Improved problem solving
 - All

Note: Satisfactory rating – 4 points

Unsatisfactory - below 4 points

You can ask you trainer for the copy of the correct answers.

Answer Sheet

1. _____ 2. _____ 3. _____ 4. _____

Information Sheet-2	Job Requirements
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2.1. Job Requirements

A Job can be defined as:

- A piece of work, especially a specific task done as part of the routine of one's occupation or for an agreed price.
- a post of employment; full-time or part-time position
- Anything a person is expected or obliged to do, duty, responsibility
- An affair, matter, occurrence, or state of affairs
- The material, project, assignment, etc., being worked upon
- The process or requirements, details, etc., of working
- The execution or performance of a task

2.1.1 .Definition of Job requirements

Job requirements are job qualifications and skills necessary for a certain position. Job requirements are usually written in form of a list that contains most important job qualifications, skills and qualities that a candidate must possess in order to be able to perform certain job duties. Job requirements are a crucial part of both job descriptions and job postings (job ads). Job requirements are “must haves” that an employer is looking for in a candidate for a certain job position.

2.1.2 Important job requirements

Job requirements are equally important for both employers and job seekers. Their main goal is to let candidates know what is required of them before they apply.

A. For employers

- For an employer, job requirements are a way of preselecting potential candidates. They are used to communicate employer's expectations from job seekers.
- By laying out clearly defined job requirements, employers can attract the right type of candidates. Over or under qualified candidates will be turned away from applying, thus saving employers a lot of time and money in the long run.

B. For job seekers

For job seekers, job requirements are the crucial part of job postings (job ads). Job requirements section of the job ads should clearly state what an employer is looking for. That way, potential candidates can know what is required of them before applying. If they

match all the job requirements criteria, it means they are a good fit for a job and they have a chance of actually getting it.

2.1.3 How-to-write-job-requirements

To write efficient job requirements, you should combine your job description with your candidate persona and choose the most important, key job qualifications and skills desired in your perfect candidate. We'll start with the content, explain the best format for presenting job requirements, optimal length and introduce possible job requirements sections.

A. Content

The golden rule for writing the content of your job requirements is very simple - it's KISS (Keep It Short and Simple).

Here are the 8 most important job requirements types:

- 1 Work experience - types and amounts (years) of work experience
- 2 Skills (soft skills and/or technical skills)
- 3 Specific knowledge
- 4 Education level and type
- 5 Professional licenses, accreditations and certifications
- 6 Personal qualities and attributes
- 7 Languages
- 8 Physical abilities.

Pick those types that are relevant for a specific job position you are looking to fill.

B. Format

Avoid writing job requirements in a form of whole sentences to avoid overwhelming and scaring off potential candidates. The best practice is to write job requirements in a form of short, bullet-point listing.

C. Length

Your job requirements should be shortest possible. Avoid writing the entire Wishlist of all your preferred skills and qualifications. The best practice is to list no more than 7 bullet points.

E.Sections

If you absolutely must list more than 7 bullet points, the best practice is to split your job requirements paragraph into 2 separate sections. In first you should list the absolute “must haves” for this job position, and in the second you can list your “nice to haves”.

You “must haves” should entail essential qualification to be considered for the job. However,

if you also have the additional “nice to haves”, you will have an even better chance of getting it. The basic requirements for a job remain the same no matter what the job is, where it is located or what professional and educational qualifications are required for it. These are as follows:

- **Discipline:** Nothing is possible without discipline.
- **Enthusiasm:** Enthusiasm for work is also a pre-requisite for any job.
- **Qualifications:** This is a more material, tactile need for a job which can be conveyed through degrees and certificates.
- **Soft Skills:** Soft skills include those skills which ensure that a job is executed well, and the employee can carry himself in the proper manner too.

2.2. Work Instruction

Information about the work

- Describe what workers need to be able to do on the job
 - ✓ Work functions
 - ✓ Key activities of each work function
 - ✓ Performance indicators
- Describe what task to be done or work roles in a certain occupation

Work instruction is a description of the specific tasks and activities within an organization. A work instruction in a business will generally outline all of the different jobs needed for the operation of the firm in great detail and is a key element to running a business smoothly.

In other words, it is a document containing detailed instructions that specify exactly what steps to follow to carry out an activity. It contains much more detail than a Procedure and is only created if very detailed instructions are needed. For example, describing precisely how a Request for Change record is created in the Change Management software support tool.

2.2.1 Procedures vs. Work Instructions

Many people confuse “procedures” with “work instructions”. In fact, most people write work instructions and call them procedures. Knowing the differences of procedures vs work instructions can help you understand the documentation process much better and, therefore, procedure documentation.

Procedures describe a process, while a work instruction describes how to perform the

conversion itself. Process descriptions include details about the inputs, what conversion takes place (of inputs into outputs), the outputs, and the feedback necessary to ensure consistent results. The PDCA process approach (Plan, Do, Check, Act) is used to capture the relevant information.

Questions that need to be answered in a procedure include:

- Where do the inputs come from (suppliers)?
- Where do the outputs go (customers)?
- Who performs what action when (responsibilities)?
- How do you know when you have done it right (effectiveness criteria)?
- What feedback should be captured (metrics)?
- How do we communicate results (charts, graphs and reports)?
- What laws (regulations) or standards apply (e.g., ISO 9001, 8th EU Directive, IFRS, Sarbanes-Oxley)?

2.3.2 Read and interpret procedures

In any given industry, every workplace has standard procedures that all employees must adhere to. A procedure is a term used in a variety of industries to define a series of steps, taken together, to achieve a desired result. Procedures explain how to accomplish a task. A procedure is sometimes called a work instruction. There are procedures for most given scenarios in the workplace such as fire evacuation procedures, machine operation procedures or official procedures for filing a complaint.

Read the procedures below. Does your workplace have something similar?

Evacuation procedures in the event of a general evacuation

1. Collect your valuables and prepare to leave
2. Make all equipment safe
3. Evacuate the room area in an orderly manner
4. move to designated assembly area by the nearest exit or as directed
5. ensure any disabled persons are assisted
6. remain at the assembly area to allow everyone to be accounted for
7. do not re-enter building until advised by the building warden, security or emergency services

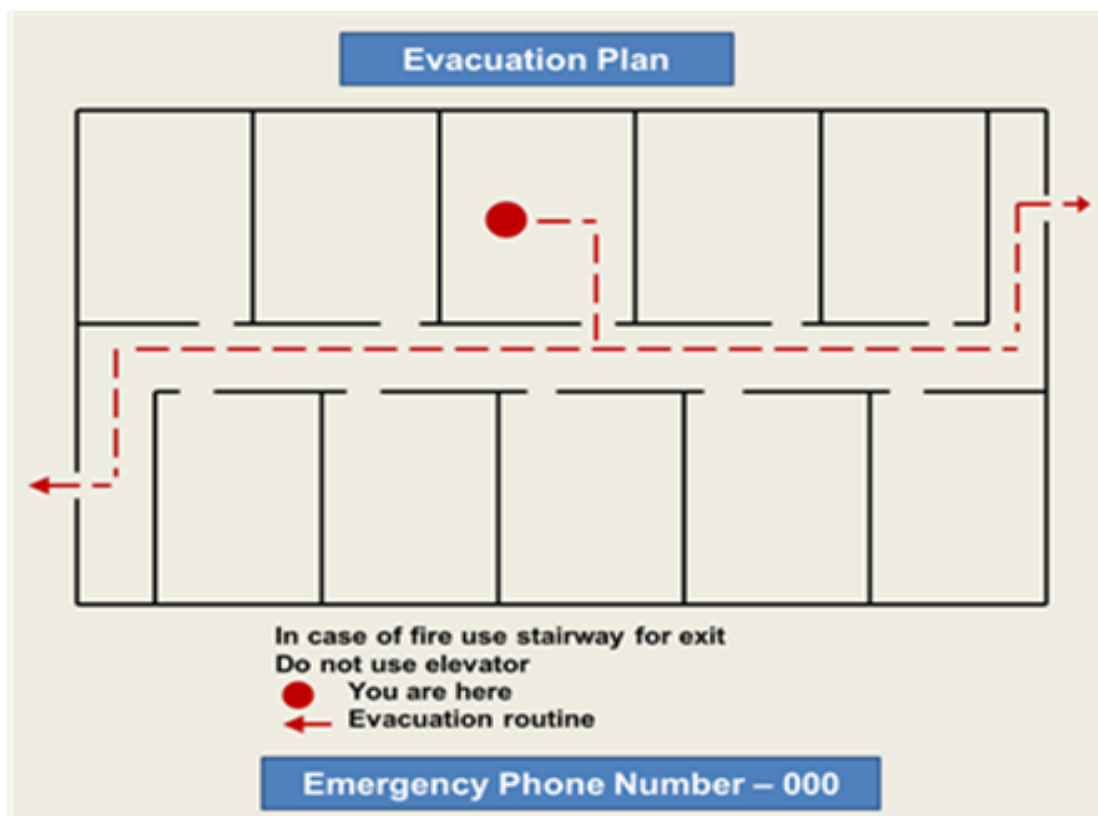


Figure-4: Evacuation plan

2.3.3 Read and interpret basic instructions, directions and/or diagrams

In every realm of employment there are instructions to follow, which are often placed within directions or diagrams. It is essential to know how to dissect, analyze and complete a given set of instructions in order to complete a given task. Often when you are in your own workplace, or even visit others, you will notice a variety of signs containing directions and diagrams all around you. This is often because of health and safety, and also because it is important for the customers and staff to follow the rules as exactly as they are presented. Many such signs contain pictures and diagrams in order to attract your attention and present information simply and clearly within picture format.



Figure-5: Basic instructions, directions and/or diagrams

2.4. Job Specification

A job specification describes the knowledge, skills, education, abilities and experience that are essential to a particular job. In short, a job specification describes the exact person that a company requires for a particular role. A job specification is not identical to a job description. A job description defines the duties and requirements of an employee's job in detail; however, most job specifications will include an overview of the duties included in the position.

2.4.1 Components of a Job Specification

Experience: The number of years of experience you have had in the role in which you desire to fill. A job specification will detail the number of years of work experience a candidate needs in order to successfully fill a position. Positions that require more complex and responsible duties, and supervisory and managerial roles, will always require more work experience.

Education: The training, degrees or certifications required for the position.

Required Skills, Knowledge and Characteristics: This is where the employer states the skills, knowledge and characteristics of other employees who were previously in this position, or what the employer requires to fill the role. Characteristics refer to personality traits that the ideal candidate must possess. These might be patience or leadership, or good time management, flexibility or attention to detail.

Overview of Job Duties: This is where the employer repeats the requirements and activities that the prospective employee must undertake in the position.

A statement of employee/workers characteristics and qualifications required for satisfactory performance of defined duties and tasks comprising a specific job or function.

Self-Check-2	Written test
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Name: _____ ID _____ Date: _____

Direction I: Multiple choice questions

- Describes the knowledge, skills, education, abilities and experience that are essential to a particular job.
 - Job requirement
 - Job specification
 - Read and interpreter procedure
 - Work instruction
- One of the following is a component of job specification
 - Required Skills
 - Education
 - Experience:
 - All
- It is a description of the specific tasks and activities within an organization
 - Job specification
 - Read and interpreter procedure
 - Work instruction
 - Job requirement

Note: Satisfactory rating – 3 points

Unsatisfactory - below 3 points

You can ask you trainer for the copy of the correct answers.

Answer Sheet

- ..
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Information Sheet-3	OHS Requirements
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3.1. Definitions of OHS

"Occupational Health and Safety deals with all aspects of health and safety in the workplace and has a strong focus on primary prevention of hazards." Occupational safety and health (OSH) also commonly referred to as occupational health and safety (OHS) or workplace health and safety (WHS) is an area concerned with the safety, health and welfare of people engaged in work or employment. Health has been defined as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."

Occupational health is a multidisciplinary field of healthcare concerned with enabling an individual to undertake their occupation, in the way that causes least harm to their health. For example, with the promotion of health and safety at work, which is concerned with preventing harm from any incidental hazards, arising in the workplace. Occupational health and safety are a planned system of working to prevent illness and injury where you work by recognizing and identifying hazards and risks.

The main focus in occupational health is on three different objectives:

- The maintenance and promotion of workers' health and working capacity;
- The improvement of working environment and work to become conducive to safety and health
- Development of work organizations and working cultures in a direction which supports health and safety at work and
- Promotes a positive social climate and smooth operation

3.2 OHS Requirements

OHS requirements are legislation/regulations/codes of practice and enterprise safety policies and procedures. This may include protective clothing and equipment, use of tooling and equipment, workplace environment and safety, handling of material, use of firefighting equipment, enterprise first aid, hazard control and hazardous materials and substances.

Personal protective equipment includes those prescribed under legislation/regulations/codes of practice and workplace policies and practices. Safe operating procedures include the conduct of operational risk assessment and treatments associated with workplace organization. Emergency procedures include emergency shutdown and stopping of equipment, extinguishing fires, enterprise first aid requirements and site

evacuation.

3.3 Safety policies and procedures

A typical OHS policy includes procedures for the following:

- Emergency situation plan
- First aid plan
- Ground and venue checklist
- Handling chemicals checklist
- Induction processes for new staff, members and volunteers
- Risk identification for members and participants

From time to time Work Safe must make decisions about how it will interpret something that is referred to in legislation, or act on a particular issue, to ensure clarity. In these circumstances, Work Safe will develop a policy. A policy is a statement of what Work Safe understands something to mean, or what Work Safe will do in certain circumstances. Health, safety, the environment and loss control in the workplace are everyone's responsibility.



Figure-6: Essential OHS policy areas

Healthy and safety procedure is the responsibility of all person in the organization. A procedure sets out the steps to be followed for work activities.

You must consult with affected workers when developing procedures for:

- resolving work health and safety issues

- consulting with workers on work health and safety
- monitoring workers' health and workplace conditions
- Providing information and training.

Procedures should be in writing to provide clarity and certainty at the workplace and demonstrate compliance. They should clearly set out the role of health and safety representatives, and any other parties involved in the activity. The procedures should be easily accessible, for example by placing them on noticeboards and intranet sites.

In the context of issue resolution where procedures are agreed to, the Work, Health and Safety Regulations 2011 include minimum requirements including that these procedures are set out in writing and communicated to all workers to whom the procedure applies.

Many workplaces are required by law to have health and safety committees, which help develop standards, rules and procedures for health and safety that are to be followed or complied with at the workplace. According to the Work Health and Safety Regulations 2011, when it comes to risk management, a procedure is a form of 'administrative control' that means a method of work, a process or a procedure designed to minimize risk.

The Work Health and Safety Act (2011) states that while at work, a worker must co-operate with any reasonable policy or procedure of the person conducting the business or undertaking (PCBU) relating to health or safety at the workplace that has been notified to workers.

3.4 OHS Standards

The followings are standards of OHS:

- Identify the hazard
- Clear the area closed to the hazard
- Partition the hazard off or clearly identify the area to protect other people from harm
- If the hazard is easily and safely cleared, then do so

3.5. Observing personal protection needs

As an employer, you are in charge of a safe and healthy working environment for your employees. You are familiar with the safety risks within your sector, as well as the measures

you can take to counteract these risks.

3.5.1 What is personal protective equipment (PPE)?

PPE means personal protective equipment or equipment you use to guarantee your (own) safety. Use PPE always and anywhere where necessary. Observe the instructions for use, maintain them well and check regularly if they still offer sufficient protection.

3.5.2. Seven types of personal protective equipment (PPE)

A. Safety for the head safety

Wearing a helmet offers protection and can prevent head injuries. Select a sturdy helmet that is adapted to the working conditions. These days you can find many elegant designs and you can choose extra options such as an adjustable interior harness and comfortable sweatbands.



Hard hat



Bump cap

Figure-7: Head safety tools

B. Protect your eyes protect eyes

The eyes are the most complex and fragile parts of our body. Each day, more than 600 people worldwide sustain eye injuries during their work. Thanks to a good pair of safety glasses, these injuries could be prevented. Do you come into contact with bright light or infrared radiation? Then welding goggles or a shield offer the ideal protection!



Goggles



Safety glasses



Full-face shield



Laser eyewear



Welding helmet

Figure-8: Eye protection tools

C. Hearing protection hearing

Do you work in an environment with high sound levels? In that case it is very important to consider hearing protection. Earplugs are very comfortable, but earmuffs are convenient on the work floor as you can quickly put these on or take them off.



Ear muffs



Ear plugs



Ear caps

Figure-9: Hearing protection tools

D. Maintain a good respiration

Wearing a mask at work is no luxury, definitely not when coming into contact with hazardous materials. 15% of the employees within the EU inhale vapors, smoke, powder or dust while performing their job. Dust masks offer protection against fine dust and other dangerous particles. If the materials are truly toxic, use a full-face mask. This adheres tightly to the face, to protect the nose and mouth against harmful pollution.



Dust mask



Half-face respirator



Full-face respirator

Figure-10: Respiratory protection tools

E. Protect your hands with the right gloves protection

Hands and fingers are often injured, so it is vital to protect them properly. Depending on the sector you work in, you can choose from gloves for different applications:

- protection against vibrations
- protection against cuts by sharp materials
- protection against cold or heat

- protection against bacteriological risks
- Protection against splashes from diluted chemicals.



Figure-11: Hand protection tools

F. Protection for the feet protection

Even your feet need solid protection. Safety shoes (type Sb, S1, S2 or S3) and boots (type S4 or S5) are the ideal solution to protect the feet against heavy weights. An antiskid sole is useful when working in a damp environment, definitely if you know that 16,2% of all industrial accidents are caused by tripping or sliding. On slippery surfaces, such as snow and ice, shoe claws are recommended. Special socks can provide extra comfort.



Figure-12: Feet protection tools

F. Wear the correct work clothing work clothing

Preventing accidents is crucial in a crowded workshop. That is why a good visibility at work is a must: a high-visibility jacket and pants made of a strong fabric can help prevent accidents. Just like the hand protection, there are versions for different applications.



Apron



Tyvek suit



Chemical protective suit

Figure-13: Work clothing

Self-Check-3	Written test
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Name: _____ ID _____ Date: _____

Direction I: Multiple choice questions

1. One of the following is OHS standard
 - A. Identify the hazard
 - B. Clear the area closed to the hazard
 - C. Partition the hazard off
 - D. All
2. The following PPE protect the head from injury
 - A. Hard hat
 - B. Apron
 - C. Boot
 - D. Goggle
3. deals with all aspects of health and safety in the workplace and has a strong focus on primary prevention of hazards
 - A. PPE
 - B. OHS
 - C. Regulation
 - D. Policy

Note: Satisfactory rating – 4 points Unsatisfactory - below 4 points

You can ask you trainer for the copy of the correct answers.

Answer Sheet

1. ..
2.
3.

Information Sheet-4**Preparing and using safety equipment and tools****4.1 Using Safety equipment and tools**

The use of PPE generally implies working in a potentially hazardous work environment and its use is a major means of injury prevention. Therefore, it is of prime importance to ensure that the equipment chosen is both reliable and effective, it is being properly used and maintained, and the user has undergone adequate training.

PPE should fit properly, snug but not tight or loose, and it should not impede movement or communication. Select the right PPE for the task. Do not wear PPE that could potentially cause injury, such as loose-fitting gloves that could be caught in moving parts of equipment or machinery. For loose fitting gloves, tape or fold a cuff on the gloves to prevent chemicals from running down the user's arm.

Do not wear PPE outside of laboratory or shop areas to prevent spreading contamination to other areas. Employees must be trained in how to don and doff PPE and the limitations of the PPE for the specific procedure. Workers need to handle PPE safely when removing it from the body to avoid contaminating themselves and surfaces nearby. Disposable gloves, sleeves, shoe covers and Type clothing and potentially contaminated PPE such as aprons, lab coats and other items need to be removed so that any contamination is not exposed. Disposable items should be peeled off turning them inside out as they are removed. Reusable gloves, aprons and other potentially contaminated items should be rinsed off before removing them, and then peeled off or folded so that the contaminated surface is inside.

4.2. Key Points on the Proper Use of Personal Protective Equipment**4.2.1. Proper selection**

You must first understand the nature and degree of the potential hazards, and then select appropriate PPE that meets the relevant standards. Furthermore, some PPE (such as breathing apparatus) must properly fit the physique of the user before they can be effective. PPE must meet the demands of the work environment and should be as comfortable and easy to use as possible.

4.2.2. Correct use

You must fully understand and abide by the correct usage methods of the PPE. Examples of incorrect use include different brands of filter being fitted to a respirator or the filters being cleaned with water.

4.2.3. Correct maintenance

PPE should be cleaned and dried after use, properly stored and regularly inspected. If you Discover any damage to the PPE; you should immediately report this to your supervisor so That it can be replaced.

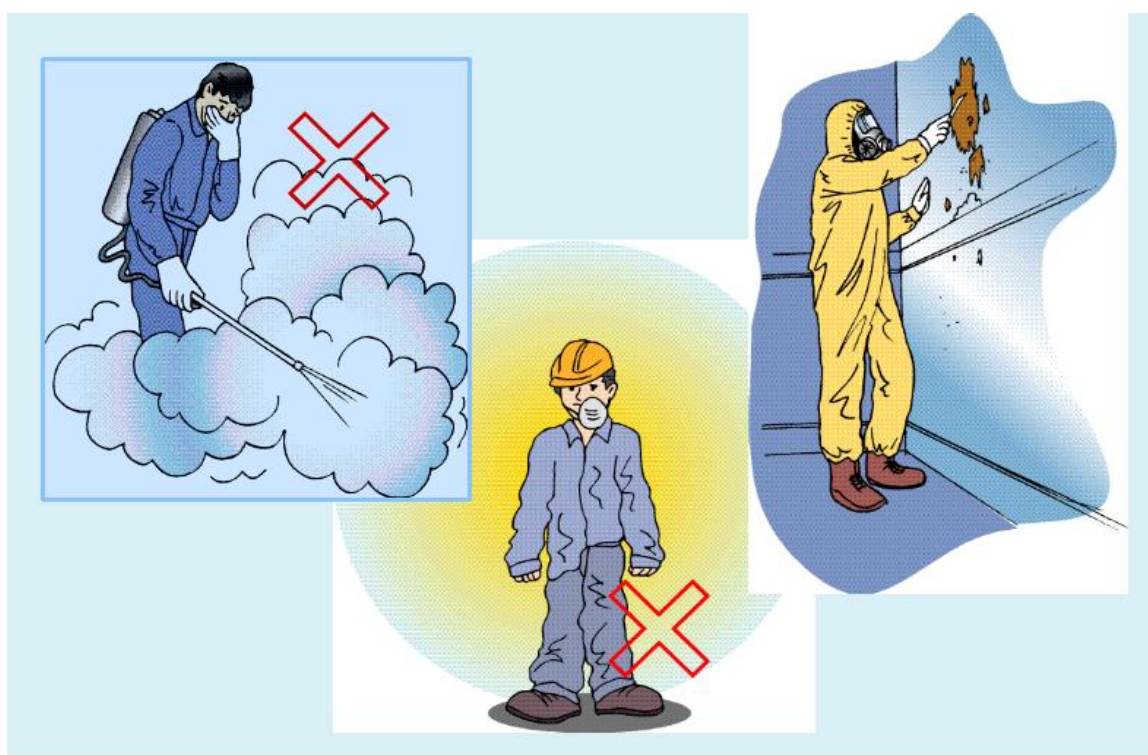


Figure-14: Correct maintenance procedure

Self-Check-4	Written test
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Name: _____ ID _____ Date: _____

Direction I: Multiple choice questions

1. The requirement to use PPE properly

- A. Proper selection
- B. Correct use
- C. Correct maintenance
- D. all

Note: Satisfactory rating – 1 points

Unsatisfactory - below 1 points

You can ask you trainer for the copy of the correct answers.

Answer Sheet

- 1. ..
- 2.
- 3.

Identifying 3S tools and equipment

You are required to prepare and use tools and equipment to implement sort, set in order and shine activities in to your work station. The following are some tools and equipment that help you in the implementation of 3S.

Tools and materials are required to implement sort, set in order and shine activities in work stations. The following are some tools and materials used to implement the first pillar of 5S-Sort.

- red tags
- sticker
- hook
- nails
- shelves
- chip wood
- sponge
- broom
- pencil
- shadow board/ tools board
- Formats (for recording necessary and unnecessary items, plans etc...)

The following are some tools and materials used to implement the second pillar of 5S-Set in order.


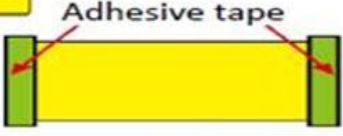

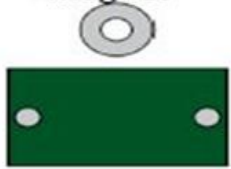
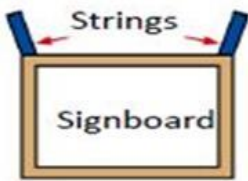


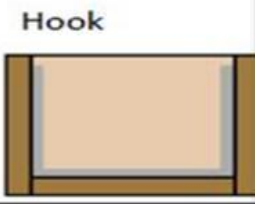
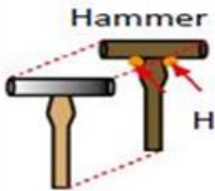
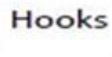






Labels	   
Signs	   
Figures	     
Partition lines	 

Figure-15: Tools and materials used to implement set in order



Figure-16: Tools and materials used to implement set in order

5.4 Tools and materials used to implement shine

The following are some tools and materials used to implement the third pillar of 5S-Shine.

- Sponges
- Brooms
- Brushes
- Spades
- Vacuum cleaners
- Waste baskets
- Dust bins
- Gloves
- Dust masks
- Detergents
- Containers
- Oils

Self-Check-5	Written test
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Name: _____ ID _____ Date: _____

Direction I: Multiple choice questions

- One of the following is a tools and materials used to implement shine
 - Sponge
 - Brooms
 - Brush
 - All
- One of the following is a tools and materials used to implement sort
 - Shelve
 - Spade
 - Wheelbarrow
 - Detergent
- One of the following is a tools and materials used to implement set in order
 - Partition line
 - Sign
 - Label
 - all

Note: Satisfactory rating – 4 points

Unsatisfactory - below 4 points

You can ask you trainer for the copy of the correct answers.

Answer Sheet

- ..
-
-

Instruction sheet	Learning Guide -2: Standardize 3S
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This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Preparing and using plan to standardize 3S activities
- Identifying tools to standardize 3S
- Understanding techniques to standardize 3S
- Understanding relevant procedures to standardize 3S
- Reporting standardize activities
- Keeping the work place to the specified standard
- Avoiding problems with standardizing activities

This guide will also assist you to attain the learning outcome stated in the cover page.

Specifically, upon completion of this Learning Guide, you will be able to:

- Prepare and use Plan to standardize 3S activities.
- Prepared and implement Tools and techniques to standardize 3S based on relevant procedures.
- Follow Checklists for standardize activities and report to relevant personnel.
- Keep the workplace to the specified standard.
- avoid Problems by standardizing activities

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below
3. Read the information written in the “Information Sheets 1, 2, 3 and 4”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks” in each information sheets on pages 37,48,51 and 56
5. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
6. If you earned a satisfactory evaluation proceed to “Operation sheets 1, on pages 56 and do the LAP Test on page 58”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity.

7. After You accomplish Operation sheets and LAP Tests, ensure you have a formative assessment and get a satisfactory result;
8. Then proceed to the next LG.

Information Sheet-1	Preparing and using plan to standardize 3S activities
----------------------------	--

1.1. Introduction to standardize

Standardization is one of the tools that can be applied in the continuous improvement of the organization. Standardized work is one of the most powerful but least used lean tools. By documenting the current best practice, standardized work forms the baseline for kaizen or continuous improvement. As the standard is improved, the new standard becomes the baseline for further improvements, and so on. Improving standardized work is a never-ending process. It reduces the variations of the process and improves the quality of products and processes. In this contribution is described 5S method, which is used in organizations to eliminate, respectively elimination of waste in the workplace through five steps.

The high standard of workplace organization can be ensured by standardization. To develop the standards employees play a great role in it. Every employee knows his responsibilities and housekeeping duties are performed in a regular routine. Best work practices are carried out and different ways are found out to ensure that every one carries out their individual activity in their workplace.

Standardization is the way in which businesses can reduce their costs (whether financial or time). It is the way an organization which aims to ensure clear, visualized and safe working environment. With proper implementation of standards prevents defects in production and at the same time constitute procedures to prevent the occurrence of other errors that could have an impact on production. It is therefore desirable to standardize all processes carried out in the manufacturing sector. The standardization process is considered the basis for continuous improvement (Kaizen). Improving standardized work is a never ending process.

Every improvement and change in the manufacturing process is completed the development of standards. Without standards, there is improvement and management. The standards define best practices for the implementation of the work. The aim is to do the job right the first time without error, without negative effects on humans and the surroundings. If you improve the standard, the new standard becomes the basis for further improvement.

1.2. Benefits of standardizing 3S

The benefits of standardized work include documentation of the current process for all shifts, reductions in variability, easier training of new operators, reductions in injuries and strain, and a baseline for improvement activities. Standardizing the work adds discipline to the culture, an element that is frequently neglected but essential for lean to take root.

The benefits are:-

- Lead to workplace standardization
 - ✓ prevent setbacks in the first three pillars
 - ✓ Make implementing them a daily habit
 - ✓ Ensure that all the three pillars are maintained in their fully implemented state
- Lead to work standardization
 - ✓ Muda elimination
 - ✓ Quality improvements
 - ✓ Cost improvements
 - ✓ Delivery time improvements
 - ✓ Process improvements
- improved safety,
- facilitate communication,
- visibility problems,
- assistance in training and education,
- increasing labor discipline,
- facilitating the response to the challenges,
- Clarification of the working procedures.
- Sizes and dimensions are co-ordinated and adapted
- Variety is reduced
- Unambiguous testing methods are established
- Easier to train new employees
- Less room for errors and scrap
- Work area is more organized
- Work area is safer

Self-Check-1	Written test
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Name: _____ ID: _____ Date: _____

Direction I: Multiple choice questions

- Benefit of standardize to workplace
 - Improve Quality
 - Eliminate mud
 - prevent setbacks in the first three pillars
 - all
- One of the following is not Benefit of standardize
 - Clarification of the working procedures
 - increasing labor discipline
 - facilitating the response to the challenges
 - none
- Where there is no standard, there can be no _____.
 - fun
 - production
 - defects
 - improvement
- Standardize is simply the result of doing the first three steps properly – namely sort, set in order, and shine.
 - True
 - False
- It is the 4th pillar of 5S
 - Sort
 - Set in order
 - Standardize
 - Sustain

Note: Satisfactory rating – 4 points

Unsatisfactory - below 4 points

You can ask you trainer for the copy of the correct answers.

Answer Sheet

1. _____ 2. _____ 3. _____ 4. _____

Information Sheet-2	Preparing and implementing Tools and techniques to standardize 3S
----------------------------	--

2.1 Common Tools and Techniques to standardize 3S

The tools and techniques used to standardize 3S are:-

- 5S Job Cycle Charts
- Visual 5S
- the Five Minute 5S
- Standardization level checklist
- 5S checklist
- The five Whys and one How approach(5W1H)
- Suspension
- Incorporation
- Use Elimination

2.1.1 5S Job Cycle Charts

5S job cycle charts, which list the 5S jobs to be done in each area, and set frequency cycle for each job (see the figure below). In the example shown in the figure below, 5S duties are sorted out according to the first three pillars and the scheduling cycle. In the figure, code letters are used for the various cycle periods:

A is for 'continuously,' B for "daily (mornings)," C for "daily (evenings)," D for "weekly," E for "monthly" and F for "occasionally." Each 5S job assignee can then use these charts as 5S Checklists. This particular example shows clearly who is responsible for each job, which area, what to do, and when to do it.

Table 1 5S Job Cycle Chart

5S Job Cycle Chart		Div./Dept./Section					Prod. Div.					
		Entered by:					Date:					
No.	5 S Job	Sort	Set in order	Shine	Standardize	Sustain	A	B	C	D	E	F
1	Red-tag strategy (occasional, companywide)	O									O	
2	Red-tag strategy (repeated)	O					O					
3	Place indicators (check or make)		O						O			
4	Item indicators (check or make)		O						O			
5	Amount indicators (check or make)		O						O			
6	Sweep around line			O				O				
7	Sweep within line			O				O				
8	Sweep around worktable			O				O				
9	Sweep on and under worktable			O				O				
10	Sweep work areas and walkways			O					O			

A job cycle code

- A. Is continuously
- B. Is daily (mornings)
- C. Is daily(evening)
- D. Is weekly
- E. Is monthly
- F. Is occasionally

2.1.2 Visual 5S

The Visual 5S approach makes the level of five pillar conditions obvious at a glance. This is particularly helpful in factories that handle a great variety and number of materials. The main point of Visual 5S is that anyone should be able to distinguish between abnormal and normal conditions at a glance.

As a factory example, consider a drill-press process where Set in order has been applied so that the position and amount of each finished work piece is clearly indicated. As an additional visual aid, the place where the last batch item goes can be marked with a thick red line to indicate that it is time to stop and send the batch to the next process.

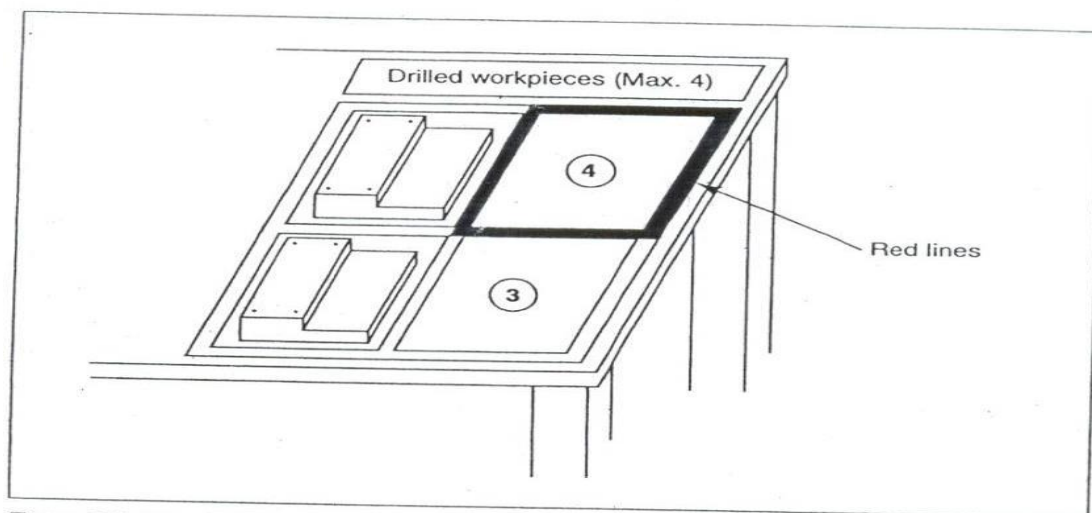
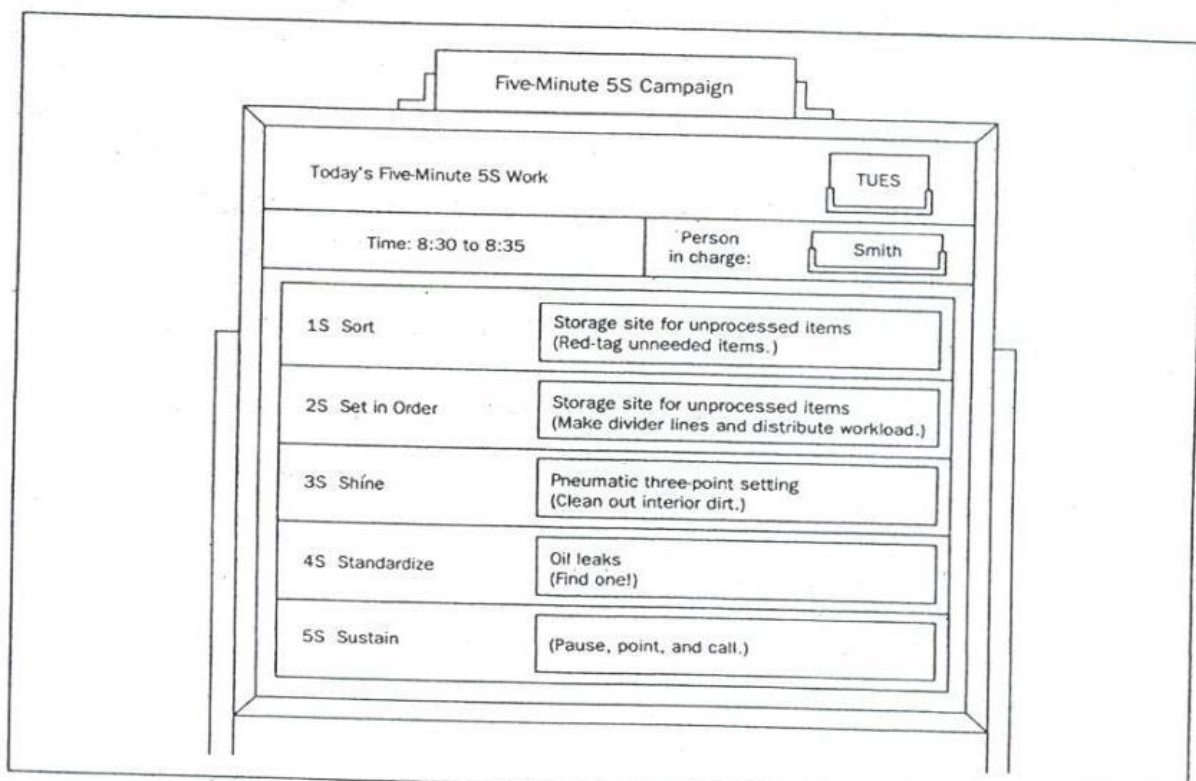


Figure 17: visual 5S method for indicating maximum batch size

2.1.3. The Five Minute 5S

When using the Visual 5S approach, instant visibility can act as a trigger for taking immediate three pillar action (Sort, Set in Order, and Shine activities) against the discovered abnormalities (i.e., overproduction, disorder, and contamination). We must also deal with the question of how skillfully and efficiently these actions are carried out. Instead of following two hours for removing all of the cutting shavings from the floor, we can set up a half-hour or a one-hour Shine procedure that accomplishes the same task. The term “Five-Minute 5S” is a loose one-the actual time can be three minutes, six minutes, or whatever is appropriate. The point is to make the five pillar work brief, efficient, and habitual. In figure below shows a signboard that was made as part of a Five-Minute 5S campaign.



Five-Minute 5S Campaign	
Today's Five-Minute 5S Work	
TUES	
Time: 8:30 to 8:35	Person in charge: Smith
1S Sort	Storage site for unprocessed items (Red-tag unneeded items.)
2S Set in Order	Storage site for unprocessed items (Make divider lines and distribute workload.)
3S Shine	Pneumatic three-point setting (Clean out interior dirt.)
4S Standardize	Oil leaks (Find one!)
5S Sustain	(Pause, point, and call.)

Figure 18: Five-Minute 5s Signboard

2.1.4. Standardization level checklist

After we have assigned the three pillar jobs and have incorporated the three pillar maintenance into the everyday work routine, we need to evaluate how well the three pillars are being maintained. For this, we can use a Standardization-level Checklist as shown in the figure below.

Standardization-Level Checklist			Dept.: Assembly Dept. 1	Feb. 15, 1994	
			Assigned area	Entered by: McCarthy	Page
No.	Process and checkpoint	Sort	Set in Order	Shine	Total
1.	Work at Line A, Process 1	1 2 3 (4) 5	1 (2) 3 4 5	1 (2) 3 4 5	8
2.	"	1 (2) 3 4 5	1 2 (3) 4 5	1 2 (3) 4 5	8
3.	"	1 (2) 3 4 5	1 (2) 3 4 5	1 (2) 3 4 5	6
4.	"	1 (2) 3 4 5	1 2 (3) 4 5	1 (2) 3 4 5	7
5.	"	1 2 (3) 4 5	1 2 (3) 4 5	1 2 3 (4) 5	10
6.	"	1 2 3 (4) 5	1 2 3 (4) 5	1 2 3 (4) 5	12
7.	Average and total for Line A	1 2 (2.6) 3 4 5	1 2 (2.8) 3 4 5	1 2 (2.8) 3 4 5	(50)

Figure 19: standardization level checklist

2.1.5 5S checklist

To evaluate the effectiveness of the maintenance activities, the evaluator ranks the Sort, Set in order, and Shine levels on a scale of 1 to 5. Such checklists can be made for specific workshop and/or production processes. One example is shown in the Figure below. 5S Checklists like the one in the figure are used to check five pillar levels in the factory as a whole. When a company implements 5S Month of intensive activities, 5S Checklists should be used to make weekly evaluation of five pillar conditions.

2.1.6 The five Whys and one how approach (5W1H)

We begin by asking "why?" until we identify the underlying causes- for every answer we get we must ask "why" again. Usually we ask "why" at least five times to get to the root of the problem. When we do find the underlying cause, we ask "how" we call fix it. Accordingly, this method is called the "5W1H" approach.

Table 2 5W1H

5W1H	Description
Why?	Necessity of the standardized activity
Who?	In-charge of the standardized activity
When?	Period / Frequency of implementation of the standardized activity
Where?	Place at where the standardized activity is taken place
What?	Objectives of the implementation (verbs) or tools used for the standardized activity
How?	Methodology to carry out the standardized activity (verbs)

When we ask "why" setting in order is breakable, we find that one answer is because people make mistakes putting things back. At this point, we need to identify what types of items are not being returned correctly. Once we identify this, the question is how to achieve unbreakable setting in order by making it impossible to return them to the wrong place. If we can somehow eliminate the need to return items at all, we can achieve unbreakable setting in order.

Three techniques for doing this are:

- Suspension
- Incorporation
- Use elimination.

1. Suspension

In the Suspension technique, tools are literally suspended from above, just within reach of the user. Figure above shows this method in practice. Here a weighted pulley device is used to suspend tools from an overhead rack. When the operator finishes using the tool, he merely releases it and it automatically returns to its proper storage place.

While this technique does not eliminate the need to return items to a specific place, it does effectively eliminate the need for people to return them. People may make mistakes in returning things, but suspension devices do not. This technique achieves

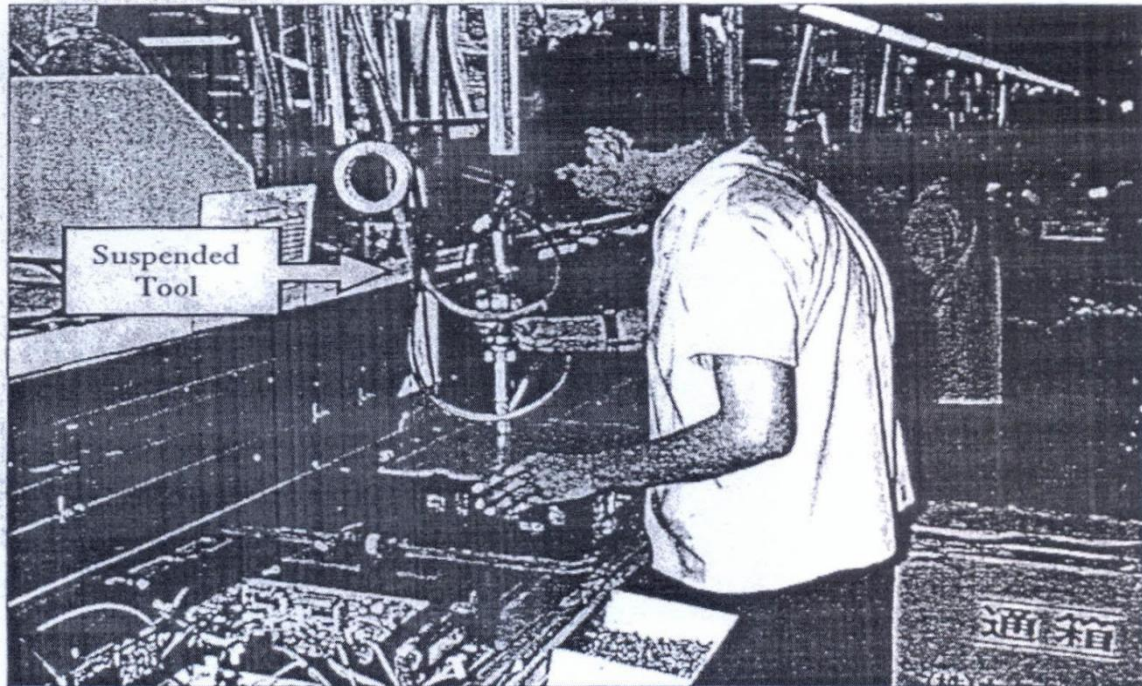


Figure 20: Tools Suspended from an Overhead Rack

2. Incorporation

It is means creating a flow of goods or operations in a factory process in which

1. jigs, tools, and measuring instruments are smoothly integrated into the process and
2. Such devices are stored where they are used and therefore do not have to be returned after use.

The figure below shows an example where a measuring gate has been incorporated into a cutting process for an automobile part. The measuring gate catches any pieces that have not been machined to the correct height. This measuring procedure is an example of "mistake-proofing" (or poka- yoke). The incorporation of the measuring gate into the cutting process means that its storage place is also its place of use. It is therefore used (for full-lot inspection)

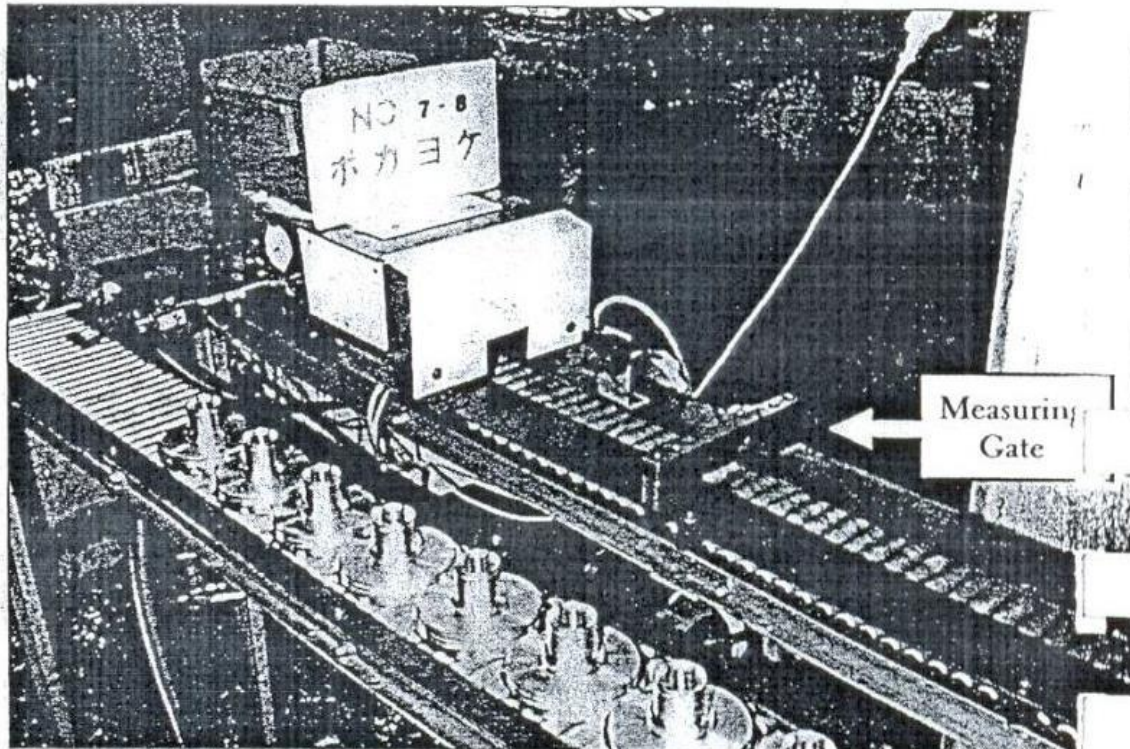


Figure 21: Incorporating a Measuring Gate into the Process Flow

3. Use elimination

Suspending or incorporating jigs, tools, or measuring instruments effectively eliminates the need to return them after each use. However, these items are still being used. The question is whether there is some way to serve the function of the tool without using the jig, tool or measuring instrument. A set in order approach that eliminates the use of a particular jig, tool or measuring instrument is in fact unbreakable setting in order.

There are three techniques for eliminating the use of certain tools:

- Tool unification
- Tool substitution
- Method substitution

Tool unification means combining the functions of two or more tools into a single tool. It is an approach that usually reaches back to the design stage. For example, we can reduce the variety of die designs to unify dies or make all fasteners that require a screw-driver conform to the same kind of screw-driver, flat-tip or Phillips.

Tool substitution means using something other than a tool to serve the tool's function, thereby eliminating the tool. For example, it is sometimes possible to replace wrench-turned bolt with hand-turned butterfly-grip bolts, thereby eliminating the need for

a wrench.

Method of substitution:-If we substitute ordinary wrench-turned bolts with hand-turned butterfly-grip bolts, we have eliminated the wrench, but we have not eliminated the method (bolt fastening). Bolt fastening is just one way to fasten things. Fastening pins, clamps and cylinders can also be used for this purpose. We may find we can improve efficiency even more by replacing one method with another.



fixed position Indications



Figure 22: fixed position indications

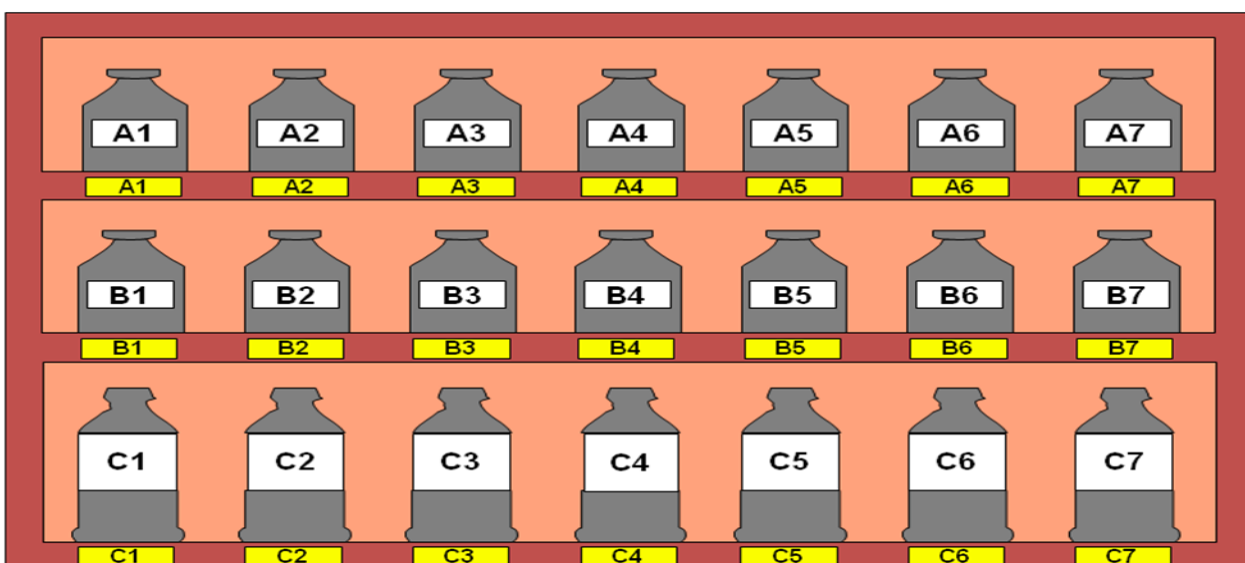


Figure 22: Indications on Shelves

Standards of pathways on premise (examples)

	Standards
Width of walkway	80 cm or more
Width of main pathway	1.2 m or more
Color of partition line	Yellow or white
Material for partition	Tape or paint

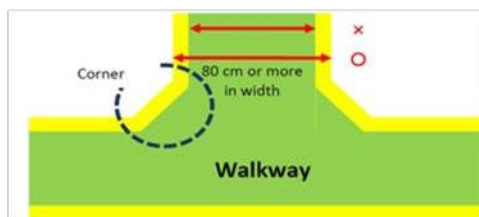


Figure 23: pathway indicator

Self-Check-2	Written test
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Name: _____ ID: _____ Date: _____

Direction I: Multiple choice questions

- One of the following is a tool and technique used to standardize 3S
 - 5S Job Cycle Charts
 - Visual 5S
 - The Five Minute 5S
 - All
- Place at where the standardized activity is taken place asks by
 - Who
 - How
 - Where
 - when

Note: Satisfactory rating –2 points

Unsatisfactory - below 2 points

You can ask you trainer for the copy of the correct answers.

Answer Sheet

- ..
-
-

Information Sheet-3

Understanding relevant procedures to standardize 3S

3.1 Relevant procedure to standardize 3S

Relevant procedures to standardize 3S are:-

- Assign 3S responsibilities
- Integrate 3S duties into regular work duties
- Check on 3S maintenance level
- OHS measures such as signage, symbols / coding and labeling of workplace and equipment
- Creating conditions to sustain your plans
- Roles in implementation

3.1.1 Assign 3S Responsibilities

When it comes to maintaining three pillar conditions, everyone must know exactly what they are responsible for doing and exactly when, where and how to do it. If people are not given clear 3S job assignments based on their own workplaces, the Sort, Set in Order, and Shine activities will not have much meaning. Similarly, clear

3S instructions must be given to the people who deliver goods from outside suppliers. The delivery sites should be clearly marked and a 5S Map posted to show where each supplier's goods are to be unloaded. At each unloading site, signboards should make it clear whose things go where and in what amount. The suppliers should be made responsible for maintaining 3S conditions at their own unloading sites and encouraged to join in full 5S implementation.

Tools for assigning 3S responsibilities include:

- 5S Maps
- 5S schedules
- 5S job cycle charts

3.1.2 Integrate 3S Duties into Regular Work Duties

If people carry out three pillar maintenance duties only when they see three pillar conditions slipping, then the five pillar implementation has not yet taken root. Maintenance must become a natural part of everyone's regular work duties. In other words, the five pillars -centered on maintaining 3S conditions-must be part

of the normal work flow. We sometimes refer to this as "5S line integration" or establishing a five pillars flow. Visual 5S and Five-Minute 5S are two approaches that help make maintenance work part of the everyday work routine.

3.1.3 Check on 3S maintenance level

Even After we have assigned 3S jobs and have incorporate 3S maintenance into everyday work routine, we still need to evaluate how well the 3S are being maintained. For this, we can set up a 5S patrol. These 5S patrols are similar to the QC patrols used in the quality control movement, except that the 5S focus is more specific and they patrol more often.

3.1.4 Roles in implementation

- integrate the benefits found through Sort, Set in Order, and Shine into the everyday work activity
- Make it a way of life
- It should be easily noticed when items are not in their place
- Keep it "visual"
- All 5S activities should be scheduled at the frequency rate necessary to maintain a clean, orderly, and safe work environment

Action steps for implementing

- Brainstorm ideas for making the 5S changes standard operating procedure. That may mean updating workplace procedures, checklists, job aids, diagrams and the like.
- Update documentation to reflect the changes. If your company has an ISO Coordinator, get the person involved to assure compliance with ISO requirements.
- Make sure all stakeholders are aware of the new standard inform and educate.

3.1.5. Creating conditions to sustain your plans

- Support from management, in terms of acknowledgement, leadership, and resources
- Rewards and Recognition for your efforts
- Satisfaction and Excitement for you and the company. 5S implementation builds as it involves more people.

Self-Check-3	Written test
---------------------	---------------------

Name: _____ ID _____ Date: _____

Direction I: Multiple choice questions

- One of the following is not a relevant procedure use to standardize 3S
 - Assign 3S responsibilities
 - 5S Job Cycle Charts
 - Integrate 3S duties into regular work duties
 - Check on 3S maintenance level
- It is a Tools for assigning 3S responsibilities
 - 5S Maps
 - 5S schedules
 - 5S job cycle charts
 - All

Note: Satisfactory rating – 2 points

Unsatisfactory - below 2 points

You can ask you trainer for the copy of the correct answers.

Answer Sheet

- ..
-

Information Sheet-4	Reporting standardize activities to relevant personnel
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4.1 Reporting

Inspection reporting shall present factual data accurately, fairly, and objectively and present findings, conclusions, and recommendations in a persuasive manner. Various means may be used to report on the results of inspection work, e.g., written reports, oral presentations, videos, or slide presentations. Regardless of the means used, there should be retrievable documentation of the reporting. The content of the reporting will be affected by the specific means used and the purpose it is serving. Reporting should be timely, complete, accurate, objective, convincing, clear, and concise.

Inspection reporting normally should describe the objective(s), scope, and methodology of the inspection and state that the inspection was conducted in accordance with the “Quality Standards for Inspection and Evaluation.” Also, inspection reporting should provide the reader with the context in which the subject matter being inspected should be viewed, such as the impact or significance of the program/activity being reviewed, to help ensure the focus is not too narrowly drawn and to give clearer understanding of the impact of any report recommendations. Reporting language should be clear and concise and, while recognizing that some inspections deal with highly technical material, should be written in terms intelligible to the intended recipients and informed professionals.

Reporting May include, but not limited to:

- Verbal responses
- Data entry into enterprise database
- Brief written reports using enterprise report formats

4.1.1 Data entry into enterprise database

An enterprise database is used by enterprises and large organizations to manage their huge collection of data. Such a database helps companies improve their efficiency. An enterprise database is robust enough to successfully handle the queries of multiple users simultaneously, and is capable of handling a range of 100 to 10,000 users at a time.

The Enterprise Manager reporting system provides flexible reporting functionality to administrators, permitting quick and easy access to information about the status, configuration, and performance of all monitored systems in their enterprise. Administrators can create, schedule, and publish a wide variety of enterprise system reports. When published to a website, these reports can be accessed by a wider audience, enabling anyone from administrators to managers to executives to quickly access information regarding their monitored environment. The reporting functionality is fully integrated with the Enterprise Manager Job scheduling system, allowing reports to be generated automatically at specific times or at regular intervals. Reports can also be generated on-demand, such as when an administrator requests to view a specific report by clicking on a link within the reporting website. The reporting system is only available for Enterprise Manager Consoles connected to a Management Server. Consoles running standalone only have access to the minimal reporting functionality that is available through the standard database management tools.

4.1.2 Brief written reports using enterprise report formats

There are five steps to follow while writing any kind of report

- Define the problem and the purpose
- Gather necessary information
- Interpret and analyze the information
- Organize the information
- Write the report

Here are some tips which might be useful in writing an activity report:

- Carefully plan the report. Identify the purpose of writing the report. ...
- Take your time in writing the report. ...
- Give your report a structure. ...
- Be honest. ...
- Write simply. ...
- Keep a backup copy of your report. ...
- Proofread.

Steps in Writing a Progress Report

- Figure out the purpose of your progress report. ...
- Begin by writing the header. ...

- Compose the introduction. ...
- Write the body of the report. ...
- Add a few details on your future plans for your project. ...
- Create a summary for your report. ...
- Review and revise your report.

4.1.3. Report Writing Format

Here are the main sections of the standard report writing format:

- **Title Section** – This includes the name of the author(s) and the date of report preparation.
- **Summary** – There needs to be a summary of the major points, conclusions, and recommendations. It needs to be short as it is a general overview of the report. Some people will read the summary and only skim the report, so make sure you include all the relevant information. It would be best to write this last so you will include everything, even the points that might be added at the last minute.
- **Introduction** – The first page of the report needs to have an introduction. You will explain the problem and show the reader why the report is being made. You need to give a definition of terms if you did not include these in the title section, and explain how the details of the report are arranged.
- **Body** – This is the main section of the report. There needs to be several sections, with each having a subtitle. Information is usually arranged in order of importance with the most important information coming first.
- **Conclusion** – This is where everything comes together. Keep this section free of jargon as most people will read the Summary and Conclusion.
- **Recommendations** – This is what needs to be done. In plain English, explain your recommendations, putting them in order of priority.
- **Appendices** – This includes information that the experts in the field will read. It has all the technical details that support your conclusions

Table -2: Report writing format

Title	
Introduction	
Body	
Conclusion	
Recommendation	

All the above report may report to the following relevant personnel such as

- Supervisors, managers and quality managers
- Administrative, laboratory and production personnel
- Internal/external contractors, customers and suppliers

Name: _____ ID: _____ Date: _____

1. One of the following is not a relevant procedure use to standardize 3S
 - A. Assign 3S responsibilities
 - B. 5S Job Cycle Charts
 - C. Integrate 3S duties into regular work duties
 - D. Check on 3S maintenance level
2. It is a Tools for assigning 3S responsibilities
 - A. 5S Maps
 - B. 5S schedules
 - C. 5S job cycle charts
 - D. All

Unsatisfactory - below 2 points

You can ask you trainer for the copy of the correct answers.

1. ..
2.

Operation Sheet 1

Procedures in Implementing Standardize

Sequence of Standardize

1. Planning for Standardization
2. Assign 3S Responsibilities for everyone in the work place by using the tools by using the tools such as 5S Maps, 5S schedules, 5S job cycle charts
3. Integrate 3S Duties into Regular Work Duties by using the two approaches: visual 5S and five- minute 5S
4. Check on 3S Maintenance Level by using Standardization-level Checklist and 5S checklist and make maintenance/correction on back sliding the 3S.
5. Prevention of back sliding of the first three pillars by using 5W1H approach, suspension, incorporation and use elimination.

LAP Test -1	Practical Demonstration
--------------------	--------------------------------

Name: _____ **Date:** _____

Time started: _____ **Time finished:** _____

Instruction I: Given necessary templates, tools and materials you are required to perform .The following tasks within 8 hours.

Task 1: Prepare standard to the sort activities in your workplace.

Task 2: Prepare standard to the set in order activities in your workplace.

Task 3: Prepare standard to the shine activities in your workplace.

Consider the: OHS procedures

Instruction sheet	Learning guide-3: Sustain 3S
--------------------------	-------------------------------------

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Preparing and following plan to sustain 3S
- Identifying tools to sustain 3S
- Understanding techniques to sustain 3S
- Inspecting workplace for compliance
- Cleaning up workplace
- Identifying unlikely situations of compliance to standards and taking actions
- Implementing improvement to lift the level of compliance in the workplace.
- Reporting sustainable activities
- Avoiding problems with sustaining activities

This guide will also assist you to attain the learning outcome stated in the cover page.

Specifically, upon completion of this Learning Guide, you will be able to –

- Prepare and follow Plan to sustain 3S activities.
- Discuss, prepare and implement Tools and techniques to sustain 3S based on relevant procedures.
- Inspect Workplace regularly for compliance to specified standard and sustainability of 3S techniques.
- Clean up Workplace after completion of job and before commencing next job or end of shift.
- Identify Situations where compliance to standards is unlikely and actions specified in procedures are taken.
- Recommend Improvements to lift the level of compliance in the workplace.
- Follow Checklists to sustain activities and report to relevant personnel.
- Avoid Problems by sustaining activities.

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below

Information Sheet-1	Preparing and following plan to sustain 3S
---------------------	--

1.1. Introduction to sustain

Sustain means to make a habit of properly maintaining correct procedures. In your life in general, what do you mean when you talk about sustaining something? Usually, you think of it as drawing on something from inside yourself in order to maintain a course of action-even when forces in your life challenge in this effort. Means making a habit of properly maintaining correct procedures

Example of “Sustain” activities

- Regular progress reporting
- Refresher training
- Periodical evaluation of 5S activities with proper advices for continuation and further improvements
- Appreciation, recognition and awarding on good 5S activities
- Reminder using 5S corner, new letters, good practice sheet etc.

1.2. Benefits of Sustain

- cleaner, safer, working environment
- Detailed tasks are documented to make processes more efficient
- Work place is maintained in an organized fashion without clutter
- Tools and materials are easier to find
- Increasing Awareness And Morale,
- Decrease In The Amount Of Mistakes That Arise Due To Un-necessaries’,
- Improvement In Internal Communication Processes,
- Improvement In Inter-Human Relations

1.3. Sustain Implementation

1.3.1.Creating Conditions to Sustain Your Plans

The implementation of the sustain pillar is different from that of the sort, set in order, shine, or standardize pillars in that the results are not visible and cannot be measured. Commitment to it exists in people's hearts and minds and only that have shown its presence. Because of this it cannot exactly be “implemented” like a technique, However, we can create conditions that encourage the implementation of the

sustain pillar.

For instance, going back to our exercise program example, how could you create conditions in your own life that would encourage sustaining your plan to work out at a gym three times a week? You might:

- Join a gym with a friend so you can work out together and encourage each other (see Figure above).
- Create a workout schedule with your friend.
- Make a plan with your spouse to eat dinner later three nights a week so you can go to the gym after work.
- Get extra sleep on the nights before you work out, so that you will not be too tired by the end of the day to follow through with your exercise plan.

These conditions would make it easier for you to sustain your schedule for exercising at the gym three times a week.

Similarly, you and your company can create conditions or structure that will help sustain to the five pillars. The types of conditions that are most useful for this are:

- **Awareness.** You and your coworkers need to understand what the five pillars are and how important it is to sustain them.
- **Time.** You need to have or make enough time in your work schedule to perform 5S implementation.
- **Structure.** You need to have a structure for how and when 5S activities will be implemented.
- **Support.** You need to have support for your efforts from management in terms of acknowledgement, leadership, and resource
- **Rewards and Recognition.** Your efforts need to be rewarded.
- **Satisfaction and Excitement.** The implementation of the five pillars needs to be fun and satisfying for you and the company. This excitement and satisfaction gets communicated from person to person, allowing 5S implementation to build as it involves more people.

1.4 Roles in Implementation

In order to sustain 5S implementation in your company, both you and the company management have important roles to play. Part of this role involves creating the conditions that sustain 5S activities. The other part involves demonstrating a commitment to 5S yourself.

A. The Role of Management

The supervisors and managers in your company have a major role to play in ensuring the success of the five pillars by creating conditions that help sustain 5S activities. This role includes:

- educating you and your coworkers about 5S concepts, tools, and techniques;
- creating team for implementation
- allowing time for implementation and creating schedules for this work
- Providing resources for 5S implementation. such as supplies-s
- acknowledging and supporting 5S efforts
- Encouraging creative involvement by all workers, listening to their ideas, and acting on them.
- creating both tangible and intangible rewards for 5S efforts
- promoting ongoing 5S efforts

Our supervisors and managers also have an important role to play in implementing the fifth pillar in their own work. When they sustain the first four pillars, they perform three very important functions.

- improving the quality and efficiency of their own work
- teaching by example
- demonstrating the company's commitment to 5 implementation

B. Yours Role

Similarly, you have an important role to play in creating the conditions that Sustain 5S activities. This role includes:

- continuing to learn more about 5S implementation
- helping to educate your coworkers about the 5S
- being enthusiastic about 5S implementation
- helping to promote 5S implementation efforts

You also have an important role to play in order to sustain 5S activities in your own work. This role includes:

- taking the initiative to figure out ways to implement the five pillars in your work on a daily basis
- asking your supervisor or manager for the support or resources you need to implement the five pillars
- participating fully in company 5S implementation efforts
- bringing to your supervisor or manager your creative ideas for promoting or implementing the five pillars
- participating fully in company 5S promotion efforts

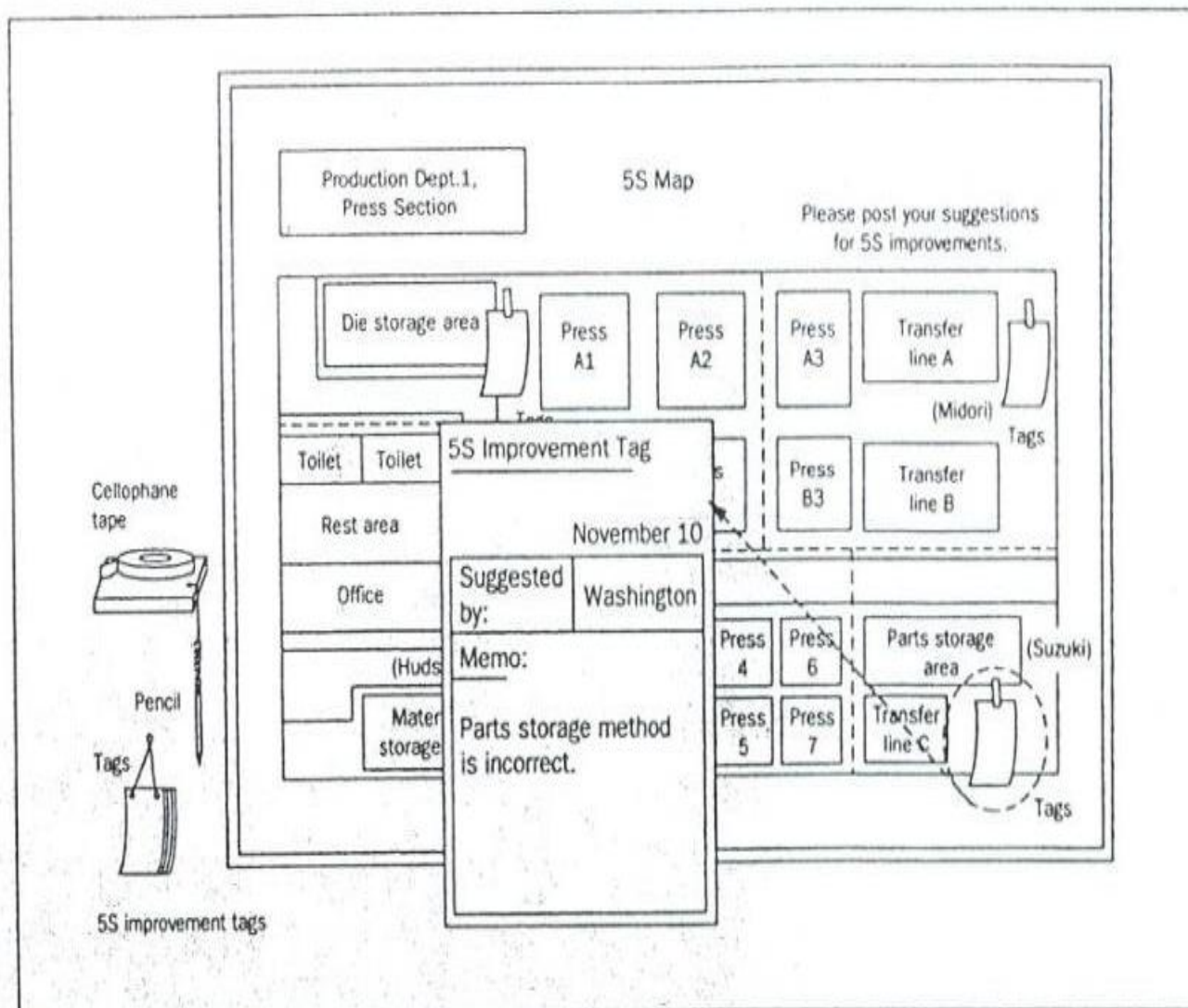


Figure-24: S map used to gather improvement suggestions

Self-Check -1	Written Test
---------------	--------------

1. it is the 5th pillar of 5S
 - A. standardize
 - B. sustain
 - C. set in order
 - D. sort
2. one of the following is the benefit from sustain
 - A. Tools and materials are easier to find
 - B. Increasing Awareness And Morale
 - C. Improvement In Inter-Human Relations
 - D. all

Note: Satisfactory rating – 2 points

Unsatisfactory - below 2 points

You can ask you trainer for the copy of the correct answers.

Answer Sheet

1. ..
2.

Information Sheet- 2	Tools and techniques to sustain 5s
-----------------------------	---

2.1 Common Tools and techniques to sustain 5s

here are many tools and techniques your company can use to help sustain commitment to 5S implementation. We offer these below so you will be aware of them. At some point in your 5S implementation work, you may be called upon to use or even coordinate the use of these techniques.

These are:

- 5S posters
- 5S photo exhibits and storyboards
- 5S newsletter
- 5S maps
- 5S pocket manuals
- 5S department/benchmarking tours
- 5S months
- 5S audit
- Awarding system
- Big cleaning day
- Patrolling system May include, but not limited to:
 - ✓ Top management Patrol
 - ✓ 5S Committee members and Promotion office Patrol
 - ✓ Mutual patrol
 - ✓ Self-patrol
 - ✓ Checklist and
 - ✓ Camera patrols

2.2.1.5S Slogans

5S Slogans communicate the themes of the five pillar campaign in your company. They are most effective when they are suggested by you and your co-workers. They can be displayed on buttons, stickers, flags, or posters.

- It encourages all the participants.

2.2.3. Samples of slogan

“Refresh yourself and workplaces by 5S activity.”

“Let's maintain current 5S activity and KAIZEN for tomorrow” “We polish “Our Minds” as well as our factories”

2.2.3.5S Posters

Posters displaying 5S Slogans or descriptions of 5S activities can be posted throughout the workplace. They can serve to remind everyone of the importance of the five pillars, or to communicate the results or status of 5S activities.

- posted throughout the workplace
- remind everyone of the importance of five pillars
- communicate results/status of 5S activities



Figure-25: S map used to gather improvement suggestions

2.4.5S Photo Exhibits and Storyboards

When it comes to communication about 5S implementation, the old saying that a "picture is worth a thousand words" is definitely true. Photo Exhibits and Story boards

showing the before and after of 5S implementation activities are powerful tools for promoting the five pillars. Photos and Storyboards can also communicate the status of five pillar activities.

- powerful tools for promoting five pillars
- communicate status of five pillar activities

2.4.2.5S Newsletters

5S Newsletters are in-house news bulletins centered on five pillar topics. They carry factory reports on 5S conditions and activities. 5S Newsletters are most effective when issued on a regular basis, perhaps once or twice a month and at staff meetings.

- In-house news bulletins centered on 5S topics
- Carry factory reports on 5S conditions/activities

2.4.3.5S Maps

5S Maps can also be used to get employees involved in five pillar improvement on an ongoing basis. 5S improvement Maps should be hung in a central location with suggestion cards attached so anyone can suggest improvements.

- Hang in central location with suggestion cards attached so anyone can suggest improvements

2.4.5.5S Pocket Manual

A 5S Pocket Manual can be created that contains five pillar definitions and descriptions, and is small enough to fit into the pocket of work clothes. Shop floor workers, supervisors, and managers can all use 5S Pocket Manuals for easy reference to the 5S essentials.

- Create 5S Pocket Manual that contains five pillar definitions and descriptions, and is small enough to fit into the pocket of work clothes.

2.4.6.5S Department Tours

When one department in a company has implemented the five pillars successfully, it can serve as a model area for other departments to come visit. Since "seeing is believing," this technique is extremely effective for promoting 5S implementation throughout a company.

- When one department has implemented the five pillars successfully, it can serve as a model area for other departments to come and visit

Companies should designate two, three, or four months every year as "5S Months." During these months, various activities such as 5S seminars, field trips, and contests can be carried out to further promote 5S implementation in the company.

- Companies should designate two, three, or four months every year as "5S Months"—5S seminars, field trips, and contests can be carried out to further promote 5S implementation

2.7.5s Audit

- The purpose of this audit is to outline an approach making 5S a success in industrial as well as our working areas.
- Enable 5S teams to design and establish a simple, effective and visual workplace organization, which creates a professional workplace and culture that is effective, organized and disciplined.
- Continual Improvement internal audit program enhance excellent service delivery
- Audit findings can be used to identify trends and the key issues.

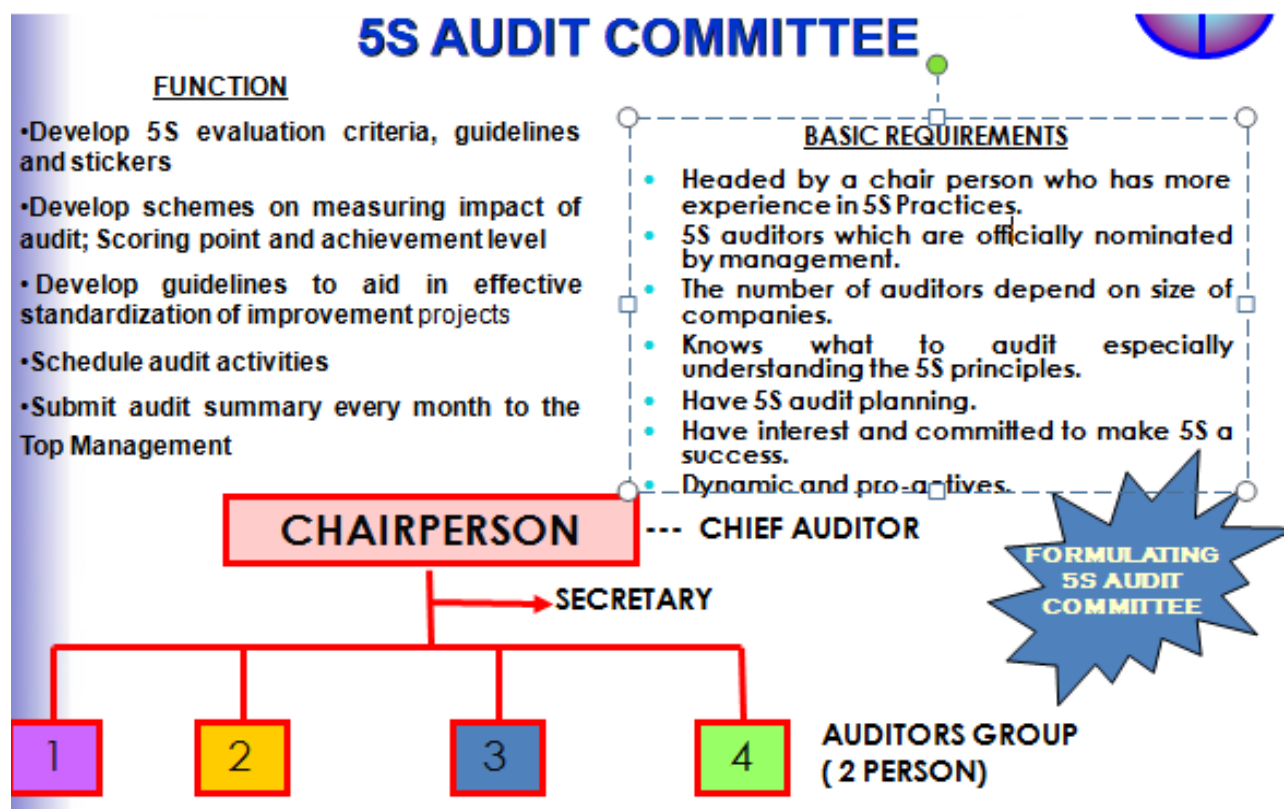


Figure-26: Establishment of 5s Committee

2.4. Performing Audit

2.4.1.Preparation

- All 5S auditors gather at the meeting room ½ hour before audit
- Briefing by 5S audit chairman:-
 - ✓ Activities of the day
 - ✓ Highlight any new criteria to be checked
 - ✓ Action date on sticker (2 weeks from audit date)
 - ✓ Time to report back
- Wearing 5S auditor tag
- Every auditor is only allowed to use up to 3 stickers at each audit to each 5S zone. It is purposely not put burden to 5S team to make improvement in very drastic manner.
- Previous audit summary report will be distributed to the auditors' team as a reference in order to avoid in consistency auditing.

2.4.2.During Audit

Bring all audit materials e.g. checklist, stickers, file holder & audit summary report

- Get the KPT leader or facilitator to accompany auditor
- Good public Relation
- Check outstanding matter from the previous audit summary report
- Proper issue of stickers & justified
- Propose idea for improvement and justified.
- Close matter when action has been taken. Remove sticker
- Issue new sticker when action is not fully satisfied (old sticker still remain) and also for new matter noted
- Provide positive suggestion for improvement if stickers is not appropriate
- Prepare audit report of each working area on the Audit summary
- Document must be signed by auditor & team leader
- Audit to the next area
- You may take 10 – 15 minutes for one zone

- Do the Top and Middle managers support 5S program?
- Are people proud of their workplaces?
- Are workplaces clean and organized?
- Are workplaces safe for people to work in?
- Are machines and equipment clean and well maintained?
- Are items easy to retrieve?
- Are machines and tools conveniently located?
- Are inventories stored for FIFO retrieval?
- Are products free from dust?
- Do people clean daily without prompting?
- Are the uniforms worn by people clean and tidy?
- Is a good image of the enterprise reflected in its people?

Develop 5S Evaluation Criteria & Guidelines

1. Set up audit checklist criteria according to area of 5S team

ASPECTS	N O	AUDITED ASPECT	SCORE					REMARKS
			5	4	3	2	1	
FLOOR	1	NO DUST ON THE FLOOR						
	2							
	3							
EQUIPMENTS ARRANGEMENT	4	TIDY AND WELL ARRANGED						
	5							
	6							
EQUIPMENTS AND TOOLS	7	IN GOOD CONDITION AND BEING USED						
	8							
	9							

2. Set-up “Audit Summary Report”

Audit Area : Group 5S
Date:

No	Areas of Audit	Improvement Needed			Contoh Cemerlang	Situation During Audit	Proposed Enhancement
		Sort	Set In Order	Shine			

Auditor: a)

Signature:

b)

Signature:

CRITERIA FOR 5S AUDIT RATING

RATING ACCORDING TO SCALE 1 TO 5

Evaluation Scale	5S Practice	5S Theory	Data/Fact
1 (0 - 30 %)	<ul style="list-style-type: none"> Nothing at all and no sense of commitment. Not doing 5S at all. 	<ul style="list-style-type: none"> No knowledge and cannot explain. 	<ul style="list-style-type: none"> No data. No improvement effort.
2 (31 - 50 %)	<ul style="list-style-type: none"> Doing some but not sufficient. Doing before auditors arrival. 	<ul style="list-style-type: none"> There is a knowledge but people do not know how to practice. 	<ul style="list-style-type: none"> There is data but superficial.
3 (51 - 70 %)	<ul style="list-style-type: none"> Doing what is supposed to do but need to put more effort. 	<ul style="list-style-type: none"> Understand and have overall knowledge. 	<ul style="list-style-type: none"> Sufficient data but not in order.
4 (71 - 90 %)	<ul style="list-style-type: none"> Almost ok, but not fully completed yet or insufficient. 	<ul style="list-style-type: none"> Almost ok, but in some are need further improve. 	<ul style="list-style-type: none"> Sufficient data and in order. Able to explain.
5 (91 - 100 %)	<ul style="list-style-type: none"> There is a proper evidence of 5S. 5S culture can be seen. 	<ul style="list-style-type: none"> Completely YES 	<ul style="list-style-type: none"> Orderly stratified data. Can show and answer immediately Visual Control is functional.

2.5.Awarding System

Awarding for 5S promotion results according to evaluation is recommended.

Awards may be:

- For Good performance
- Award for efforts
- Award for good Ideas
- Prize winner
 - ✓ Group
 - ✓ Individual

2.5.1. Big Cleaning Day

It is a cleaning that carried out from two to four hours by the organization.

Example: Before national holidays

2.5.2. Patrolling System

- Top management Patrol
 - ✓ Check Up the activities Comprehensively
 - ✓ Give emphasis on sustaining of the activity

- | | | | |
|---|--|---|----------------------|
| <p>Irrigation and Drainage Construction</p> <p>Level II</p> | <p>Author/Copyright: Federal TVET Agency</p> | <p>Version -2</p> <p>September 2020</p> | <p>Page 74 of 82</p> |
|---|--|---|----------------------|

Self-Check -2**Written Test**

1. One of the following is a tools and techniques sustain 3S
 - A. 5S Job Cycle Charts
 - B. 5S slogans
 - C. Visual 5S
 - D. 5W1H
2. Patrol systems are
 - A. Mutual
 - B. Self
 - C. Checklist
 - D. all

Note: Satisfactory rating – 2 points

Unsatisfactory - below 2 points

You can ask you trainer for the copy of the correct answers.

Answer Sheet

1. ..
2.

Information Sheet- 3	Inspecting workplace for compliance
----------------------	-------------------------------------

3.1 Introduction to workplace inspection

Workplace inspections help prevent incidents, injuries and illnesses. Through a critical examination of the workplace, inspections help to identify and record hazards for corrective action. Health and safety committees can help plan, conduct, report and monitor inspections. Regular workplace inspections are an important part of the overall occupational health and safety program and management system, if present.

Formal inspections can take different forms and you and your representatives will need to agree the best methods for your workplace. Here are some of the ways inspections can take place.

- Safety tours - general inspections of the workplace
- Safety sampling - systematic sampling of particular dangerous activities, processes or areas
- Safety surveys - general inspections of particular dangerous activities, processes or areas
- Incident inspections carried out after an accident causing a fatality, injury, or near miss, which could have resulted in an injury, or case of ill health and has been reported to the health and safety enforcing authority.

3.1. Purpose of inspection

Inspections are important as they allow you to:

- listen to the concerns of workers and supervisors
- gain further understanding of jobs and tasks
- identify existing and potential hazards
- determine underlying causes of hazards
- recommend corrective action
- monitor steps taken to eliminate hazards or control the risk (e.g., engineering controls, administrative controls, policies, procedures, personal protective equipment)

3.3. Following-up after an inspection

After an inspection:

- Explain the reasons for any follow-up action you decide to take to your representatives.
- Let the representative who notified you of the inspection have the opportunity to inspect again so they can check if the issues raised got appropriate attention, and record their views.
- Share the follow-up action taken throughout the workplace and other relevant parts of the business, including the health and safety committee where there is one.

Written test

2. Write ways of inspection(3 point)

Unsatisfactory - below 2 points

You can ask you trainer for the copy of the correct answers.

Answer Sheet

1. ..

2.

Operation sheet-1

Procedures in Implementing Sustain

Sequence of Sustain

1. Planning
 - Set schedules for sustaining techniques
2. Prepare sustaining Tools and Techniques
1. Implement sustaining activities
2. Feedback comments on the sustain results

Lap test	Practical demonstration
-----------------	--------------------------------

Name _____ Date _____

Time start _____ Time finished _____

Instructions: Given necessary templates, workshop, tools and materials you are required to perform the following tasks within ----- hours.

Task 1: Prepare slogans and posters for your work area.

Task 2: Evaluate your work place by using the 5S check list and use stickers.

Task 3: Prepare audit summary report by using the given template

3.1 identify the:

- ✓ Person -in-charge
- ✓ Technology workshop
- ✓ Work station

3.2 consider the:

- ✓ OHS procedures
- ✓ Workplace procedures and standards (work area)

3.3 Frequency of maintenance activity

Reference

1. 5S for operators (1995)
2. www.kaizen-institute.com
3. Barnes,T.,” Kaizen strategies for successful leadership”,1996, Pitman Publishing
London
4. www.leankaizen.co.uk

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