

Textile Processing Technology

Level-I

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Acronym

- KPT = Kaizen Promotion Team.
- TPS = Toyota Production System.
- LAP = Learning Performance Activity.
- PDCA = Plan, Do, Check, Act.

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Introduction to the module

The 5S method was created and developed in Japan, as an important part of the TPS. This system was promoted by two Japanese experts, Osada and Hirano, as a way to keep the workspace clean, tidy and accessible, influencing self-esteem and morale. Hiroyuki Hirano, in a case study on manufacturing systems, had firstly integrated production data and many western managers have considered that the phenomenon belongs to rational knowledge. In practice, the management is always based on the development of production and best practice elements and Hirano developed a structure for improving, a knowledge based production development management system. He pointed out a number of steps that can be identified, each being based on the previous one.

“Quality starts with you” is the motto and as far as we know, the proper functioning base of a company is the trust and the climate of the working environment. The confidence is developing if each employee carries out correctly his duties and respects the existing rules. If

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there is certainty that each individual will do the right thing, the next step of the analysis is done more efficiently and with confidence. Quality begins with people and therefore, with order and cleanliness, that one can use the 5S methodologies to reach a high quality level.

5S is a fundamental tool to promote continuous improvement process in organizations and represents a transformation in 5 steps of a job, which is characterized by maximum efficiency at the micro level and minimum loss. The system creates an environment where all objects are easier to find and any deviation from the normal situation becomes apparent by visual management methods. In the same time, 5S techniques maintain quality, promote a significant costs reduction by eliminating the losses and provides the best framework for progress throughout the organization.

The 5 phases are Seiri, Seiton, Seiso, Seiketsu and Shitsuke, which can be translate as Sort, Set in order, Scrub, Standardize, and Sustain, focusing on orderliness and being applied especially in Japanese factories. In some companies, the 6th S is added – the Safety step, combining orderliness with safety and being described by clean, safe, and orderly. There are other phases as security and satisfaction that could be added, enhancing the consciousness. Since improve the industry status as one key factor due to high wastages of resources especially in textile processing sector the 5s principle should be done practically.

This module covers the units:

- Prepare for work
- Sorting
- Set in order
- shine
- Standardize 5S
- Sustain 5S

Learning Objective of the Module

- Prepare for work
- Sort items
- Set all items in order
- Perform shine activities
- Standardize 5S

Module Instruction

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For effective use this modules trainees are expected to follow the following module instruction:

1. Read the information written in each unit
2. Accomplish the Self-checks at the end of each unit
3. Perform Operation Sheets which were provided at the end of units
4. Do the “LAP test” giver at the end of each unit and
5. Read the identified reference book for Examples and exercise

Unit one: Prepare for work

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

- Using work instructions
- Reading and interpreting Job specifications
- Preparing and using 5S tools and equipment
- Identifying and checking safety equipment and tools

Preparing and using Kaizen Board This unit will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Using work instructions
- Reading and interpreting Job specifications
- Preparing and using 5S tools and equipment
- Identifying and checking safety equipment and tools
- Preparing and using Kaizen Board

1.1. Work instruction

- Identify and check safety equipment and tools for safe and effective operation.

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 too

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

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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.

1.2. Job Specification

A statement of employee/workers characteristics and qualifications required for satisfactory performance of defined duties and tasks comprising a specific job or function on the following interpretation specifically in textile department on all streams.

- Kaizen Basics and textile processing sector.
- Improve 5S in textile process area.
- Describe Kaizen principles, pillars and concept.
- Identify basics, principles and stages of KPT.
- Establish structure of Junior KPT in accordance with the organizational procedures.
- Make effective and appropriate contributions to complement team activities and objectives based on individual skills and competences.
- Develop team work plans based on an understanding of KPT’s role and objectives.
- Use effective and appropriate forms of communications and undertake interactions with KPT members who contribute to known KPT activities and objectives.
- Prepare and use Kaizen board (Visual Management board) in accordance with workplace situation.

1.3. 5S tools and equipment



Figure 1.1 5S tools and equipment

Mr. Masaaki Imai is one of the Japanese people who contributed to spreading of the term Kaizen throughout the world. Mr. Imai today serves as the president of a consulting company Cambridge Research Institute. In his book entitled “Kaizen: The Key to Japan’s Competitive Success’ published In 1986, defined Kaizen as “a Japanese business philosophy that assumes our way of life be it our working life, our

social life, or our home life – should focus on continual improvement efforts”. The Oxford English Dictionary also gives the following definition of Kaizen “a Japanese business philosophy of continuous improvement of working practices, personal efficiency, etc.”



Cambridge Research Institute, President. Mr. Imai’s 1st book on 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. Mr. Imai also stated “Kaizen is not just a management technique but a philosophy which instructs how a human should conduct his or her life. Kaizen focuses on how people conduct their work. It shows how management and workers can change their mindset together to improve their productivity”. Not a day should go by without some kind of improvement being made. We have to ask always: how can we do the job better tomorrow, than we are doing it today? Engineers at Japanese plants are often warned, “There will be no progress if you keep on doing things exactly the same way all the time.” For the U.S, Kaizen’s clear message is “do it better, make it better, and improve it even if it isn’t broke, because if we don’t, we can’t compete with those who do.” The Ethiopian Kaizen Institute developed its own working definition as follows: "Kaizen is a philosophy of continual, participatory and self-disciplined innovation management having its own integrated systems and problem solving tools, implemented with the highest level of commitments at all levels of owners, leaders and employees through enhancing their absorptive capability step by step aiming at creating new and advanced corporate culture to catch-up and attain world class competitiveness". 5S is a systematized approach to standardize work environment of an organization so as to create a workplace that is more organized, more efficient, safer, cleaner, and more pleasant to

work in, and to maintain it on an on-going basis. The pillars of 5S are all Japanese words beginning with the letter S. Since their adoption within Western implementations of lean, various anglicized versions of the terms have been adopted by different writers and educators. 5S consists of: (1) Seiri = Sort; (2) Seiton= Set in Order; (3) Seiso = Shine; (4) Seiketsu = Standardize; (5) Shitsuke = Sustain.

5S represents a starting point of Kaizen, i.e. by establishing and maintaining standardization of work environment, it provides the basis for future improvements in the operations of the organization. These five pillars represent a starting point for any company that seeks to be recognized as a responsible manufacturer eligible for world-class status. When we say something about 5s tools there is kaizen in its internal structural system of all over the fundamental key issue on our day to day life. QC 7 tools are the most frequently used analytical tools for QC activities and Kaizen activities. They are: (1) graphs; (2) check sheets; (3) histogram; (4) control charts; (5) Pareto charts; (6) fish-bone charts (cause-and-effect diagrams); and (7) scatter diagram.

1.4. Safety equipment and tools

The main issue of use safety equipment and tools reduce or eliminate like, physical risks, chemical, ergonomic and physiologically, working hours, incorrect ventilation, dust chemical and noise are some of the things that can preventing safety equipment to protect from harm cause. Textile industries involve diverse operation including pretreatment in textile wet processing room. Textile operations have been studied extensively and found numerous health and safety issues associated with the textile industry materials. Synthetic dyes have provided a wide range of colorfast, bright hues. However their toxic nature has become a cause of grave concern to environmentalists. Use of synthetic dyes has an adverse effect on all forms of life. Presence of sulphur, naphthol, vat dyes, nitrates, acetic acid, soaps, enzymes chromium compounds and heavy metals like copper, arsenic, lead, cad- mium, mercury, nickel, and cobalt and certain auxiliary chemicals all collectively make the textile effluent highly toxic.



Figure1.2 safety

1.5. Kaizen board

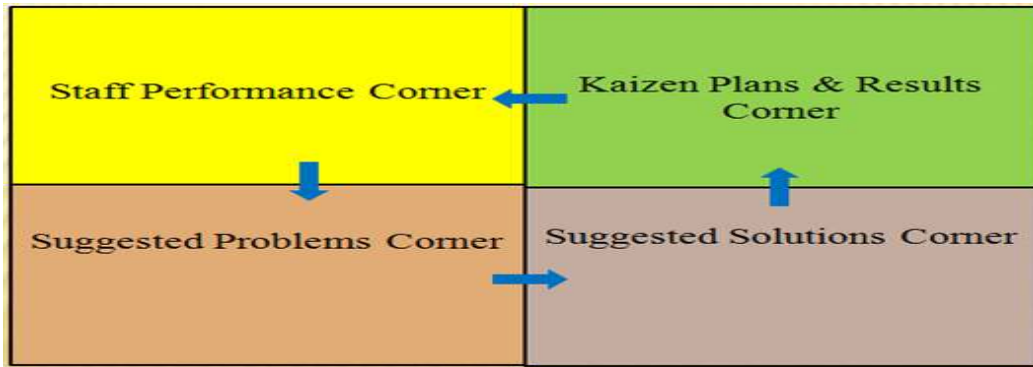


Figure1.3 Kaizen board

Self-check-1

Instruction I: write if the statement is correct say true or if the given statement is not correct say false

1. Personal protective equipment is **not** mandatory for dyeing operation. (2 points)
2. Textile industries involve diverse operation including pretreatment in textile wet processing room.(2points)

Instruction II: Choose the best answer from the following alternative

1. From the following alternative which concept is **not** true about personal protective equipment?
A/ use safety shoe B/ use safety glasses, C/eye shoe, D/ all the above
2. Among the following one is necessary for job requirement?
A/ qualify with practice about dyeing B/ Tenetative skill practice, C/no need any requirement, D/ A&B

Instruction III: write short answer for the given question. You are provided 3 minute for each question and each point has 5Points.

1. Define the word kaizen according to textile wet processing area?
2. Define the word standard operation procedure as a kaizen in textile dyeing?

Note: Satisfactory rating – above 60% Unsatisfactory - below 60%

You can ask you teacher for the copy of the correct answers

Unit Two: Sorting

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

- Sorting
- Cleaning activities
- Identifying workplace
- Necessary and unnecessary items
- Red tag strategy
- Unnecessary items
- Record and quantify necessary items
- Performance results
- Items in the workplace

Preparing and using Kaizen Board This unit will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Prepare sorting plan
- Perform Cleaning activities
- Identify workplace items
- List necessary and unnecessary items
- Use red tag strategy
- Evaluate and placing unnecessary items
- Record and quantify necessary items
- Report performance results
- Check necessary items in the workplace

2.1. Sorting

Preparing means to make ready beforehand for a specific purpose, as for an event or occasion: the teacher prepared the students for...to put together or make by combining various elements or ingredients; manufacture or compound: prepared a meal; to fit out; equip: prepared the ship for an arctic expedition. The first step in 5S is to eliminate all the things in the workspace that are not being used and store them away. If a tool or material is not used on a daily basis, eliminate it from the workstation. A plan is typically any diagram or list of steps with details of timing and resources, used to achieve an objective to do something. It is commonly understood as a temporal set of intended actions through which one expects to achieve a goal.



Figure 2.1 Chemical Laboratory store without kaizen



Figure 2.2 sorting

Sorting is the 1st action from five components of 5S. It means sorting out necessary and unnecessary items in the workplace, dispose of the unnecessary and keep only those items necessary for the current operations of the workplace.

Sort is also defined as Separate what is needed and what is not needed, and keep only those things that are needed in the workplace. Discard unnecessary items, sort is an organization: distinguish between what is necessary and what is less essential, removing unnecessary items or tools from the workplace. Sort means Separate the required equipment, materials, and instructions from those that are not needed. Remove anything from the work area that isn't required.

Table 2.1. Plan template

Activities	Timing							
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Establish kaizen promotion team (KPT)								
Recognition of current place								
Decide target areas								
Set goal								
e.t.c								

NB, Time may be hour day, month, 1/4year, 1/2year, & year e.t.c.

2.2. Cleaning activity

Cleaning is a system cleaner **removes unnecessary files from targeted (wet processing area) when it is run.** It takes care of temporary files like Internet browsing caches or leftovers after Windows Updates activities. There are different types of cleaning system, like dry cleaning, pressure cleaners, sweepers and polishers, but also vacuum cleaners. It is important to choose the right equipment for a certain cleaning job.

- i. **Pressure cleaners** are machines that use high-powered steam to get rid of stains and dirt. They are especially ideal for cleaning concrete regions such as walls, patios, and walkways. They can ideally be used to clean cars, Lorries, and caravans. Pressure cleaners come in various shapes and sizes.
- ii. **A sweeper** is controlled by a driver who sits on a commercial sweeper and uses a driving wheel to steer the device. These are especially useful for cleaning vast outdoor areas like the pavement outside a huge commercial place or on roads.
- iii. **A carpet cleaner** is another essential. These cleaners have the ability to remove stubborn stains from almost any carpet area. They are quite essential when it comes to cleaning as they are one of the best devices to remove hard to budge stains without the need to replace the carpets.

Dry cleaning

Dry cleaning is a cleaning process for textiles using a chemical solvent rather than water. by using tetrachloroethylene(perchloethylene),sometime trichloroethane can substitute tetrachloroethylene.



Figure2.3. tetrachloroethylene(perchloethylene) cleaning

2.3. Workplace items

Work place is an area which is use to activate or perform the plan someone succeed necessary things on the required purpose.



Figure2.3 workplace items

Identify means to determine who or what someone or something is or distinguish something.

- **Necessary items**

The 5S Pillars **Sort**, the first S, focuses on eliminating unnecessary items from the workplace that are needed for current production operations.

2.4. Red tag strategy

The 5S Red Tag process is a great way to clean and organize your workspace to optimize efficiency. As the name implies, the Red Tag process utilizes 5S red tags to sort through items that are taking up space and may no longer be needed. It's the first step of the larger 5S methodology for a lean workplace the red tag strategy is a simple method for identifying potentionally unneeded items in the cell, evaluating their usefulness, and dealing with them appropriately.



Figure2.4 red tag

2.5. Evaluate and place unnecessary items

Sorting through the contents of the workplace and removing unnecessary items. This is an action to identify and eliminate all unnecessary items from the workplace. Evaluating information sources is important part of the research process. Not all information is reliable or true, nor will all information be suitable for your paper or project. Print and Internet sources vary widely in their authority, accuracy, objectivity, currency, and coverage. You, as the information consumer, must be able to critically evaluate the appropriateness of all types of information sources prior to relying on the information. The Internet has

surpassed most libraries in the quantity of information it makes available. However, the Internet has not surpassed libraries in the overall quality of information it makes available.

Five steps to evaluate the content

- Preparing your content evaluation. First, think about the purpose of your audit.
- Making an inventory of your content.
- Identifying weak and strong content.
- Presenting your findings to your colleagues.
- Regularly repeating content evaluation.

2.6. Record and quantify necessary items

Something that records: such as something that recalls or relates past events. An official document that records the acts of a public body or officer.

2.7. Report performance results

To create a performance report of the data, consider following these five steps, organize the data Collaborate with teams to collect the relevant data you need for report.

- Follow a template.
- Write the report.
- Proofread before sharing.
- Monitor continuously.

2.8. Necessary items in the workplace

Balance board. Balance boards can be great additions to a company or home office, especially if you like to work on your feet.

- Heating pad.
- Personal fan.
- Notepad.
- Clock.
- Laptop stand.
- Healthy snacks.
- Small humidifier.
- On dying apparatus check.



Figure2.5 necessary items in the work place

Self-check-2

Instruction I: write if the statement is correct say true or if the given statement is not correct say false

1. Sorting is the 2nd action from five components of 5S.(2 marks)
2. Kaizen is **not** essential in textile laboratory shelf.(2 marks)

Instruction II: choose the best answer from the following alternative.

1. Which activity is 1st from 5s components? A/ shine B/ set in order, C/sort, D/ standardize
2. ___ means select necessary and unnecessary items? A/ shine B/ set in order, C/sort, D/ standardize

Instruction III: give your short Answer for the following questions. You are provided 4 minute for each question.

1. Define the term sorting as a kaizen practice?(4marks)
2. List at least two main target of sorting?(4marks)

Operation Sheet 2	
Operation Title	Sorting
Purpose	To understand the skill of sorting on the wet processing/targeted place, practical class room,environment,compound.
Instruction	By using the given chemicals recipe which is found in procedure the dyeing sorting activity.
Tools, Equipment and Materials	<ul style="list-style-type: none"> • Healthy snacks, Small humidifier, dying apparatus, Record book/Agenda,Meter,Spoon,Beaker,Stirrer,Thermometer, indicator/litmus, Oven dryer,Stove, Personal fan and Cutter.
Precautions	<p>→ Follow the correct procedure/steps in listed bellow.</p> <p>→ Perform the given operation based on the operational requirement including by applying sorting.</p>
Procedures in doing the task	<p>→ Review the procedure and learning guide manual</p> <p>→ Identify necessary equipment & tools</p> <p>→ Follow the procedure which is found bellow “A”correctly</p>
Conditions or situations for the operation	<p>→ The practical class room (dyeing laboratory) safe and well organized.</p> <p>→ The class room must be suitable and chemicals sort in the lab shelf.</p> <p>→ Instruments and machineries available in working lab (safe arrangement).</p>
Quality criteria	→ Apply Sorting activity.

Procedure “A”

Step1. prepare kaizen board.

Step2, clean the room and the environment

Step3, plan the cleaning schedule based on the the order of the the Trainer/Instructor.

Step4,check the system which is doing based on the current situaion.

Step5,return the whole hand tools,equipments, and other things which is use for preparation.

LAP Test

Task 1: Clean the wholee environmet.

Task2:Measure the necessary things/raw materials

Task3: Apply sorting activity based on the the order of the the Trainer/Instructor

Task4: Add the prepared recipe, mix fabric with beaker and apply reactive dye.

Task,Return the whole hand tools,equipments, and other things which is use for preparation.

k 5: Check the system which is doing based on the current situaion.

Note: Satisfactory rating – above 60% Unsatisfactory - below 60%

You can ask you teacher for the copy of the correct answers

Unit Three: Set in order

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

- Set in order
- General cleaning activities
- Layout and indicate methods
- Necessary tools and equipment
- Items & their assigned locations
- Return used items
- Report results
- Check item's location

This unit will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to

- set in order plan
- Perform general cleaning activities
- Decide locate/Layout, storage and indication methods
- Prepare and using necessary tools and equipment
- Place items in their assigned locations
- Return used items
- Report performance results
- Check each item's location and order

3.1. Set in order

Set all items in order set in order was originally called “seiton,” which translates to “orderliness.” A variety of names have been used in English: “Systematic Organization,” “Straightening Out,” and “Simplify,” for example. No matter what it’s called, the goal of this step is to organize the work area. Each item should be easy to find, use, and return: a place for everything, and everything in its place. Draw up a map, and then implement it Physically arrange the workplace first, and then map it out Map as you go, testing ideas and writing down what works well no matter which approach is used to create it, the resulting 5S map should be kept as a training tool, used for reference in later steps of 5S, and updated over time as the work area changes. Communicating the Plan: Is storage a location is assign; each storage area should be labeled. Label the outside of cabinet doors to help workers quickly identify what’s inside each one.

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Then, label any interior shelves to show where different supplies belong. The same ideas extend to rack labels, bins, and other storage systems.

Many facilities use a “shadow board” for tool storage, to ensure that each tool is easy to put back in its correct storage place. With this approach, a label matching the shape and size of the tool is placed where that tool belongs. Workers can immediately spot where each item belongs, and know at a glance if the item is there or not. No more time wasted looking through drawers and bins.

Organization can extend to the floor too. Work areas, movement lanes, and storage for supplies and finished products can all be marked with floor marking tape. Arrange items in cabinets so they can be removed quickly and easily when needed.

Preparing and using necessary tools and equipment

As presented by Masaaki Imai, Kaizen is an umbrella concept that embraces different continuous improvement activities on an organization as shown in the figure below. There are a large number of related and often overlapping implementation methods and technical tools that belong to the kaizen Toolkit. Basing on kaizen philosophy and through following kaizen systems, Kaizen tools bring continuous improvement.

5S is a systematized approach to standardize work environment of an organization so as to create a workplace that is more organized, more efficient, safer, cleaner, and more pleasant to work in, and to maintain it on an on-going basis. It consists of Sort, Set in Order, Shine, Standardize and Sustain for textile sector tools as one component.



Figure3.1 set in order chemicals

3.1.1 Procedure

- Decide quantity and location of items to be stored in the cabinet.
 - ✓ Frequently used items are placed close and at an easily reached height.
 - ✓ Arrange by function or process.
- Determine the placement method so it can be easily seen if an item is in place.
 - ✓ If the returning task is helped by using different shapes, use a base plate with matching shapes.
 - ✓ On files, file number is written diagonally.

- Clarify contents of cabinets with labels on the outside of the door.
 - ✓ If stored in boxes, identify contents of each box.

Clarifying Location for Part Shelves and Chutes



Figure3.2 set in order documents

To organize is to set in order a group of objects, to establish a rational, methodical and systematic order of all production elements (textile wet process like pretreatment, dyeing, finishing and printing) with the aim to always have the necessary amount when they are needed. The organization is achieved in the following guidelines:

- Fix a storage location (decide where things are preserved), with the steps:
 - Removal of unnecessary things
 - Selecting a classification and organization of the deposit
 - Standardization of elements titles – labels
- Set-up a storage method (decide how to keep things), with the points:
 - ✓ choose an appropriate method for storage type
 - ✓ display the items titles
 - ✓ facilitate storage and remove items
- Maintain the regulations respecting the storage type, with the key points:
 - ✓ daily control (not to be lack of material)
 - ✓ improving of procedures

training enhances efficiency for storage and disposal actions. For unnecessary objects, a central red area is fixed. Things that can be used in the future will be placed near the work place and the absolutely necessary elements are placed into the workplace.

Since it is the 2nd of the five components of 5S. Set-in-order means deciding the place for necessary items, arrange them to keep easy access, and display signs so that they can be found immediately and returned or replenished properly.



Figure3.3 set in order in different work places

Self-check-3

Instruction I: write if the statement is correct say true or if the given statement is not correct say false

- Set in order is the 2nd action from five components of 5S.(2 marks)
- Putting randomly is better based on the kaizen principles.(2 marks)

Instruction II choose the best answer from the following alternative.

4. Which activity is 2nd from 5s components? A/ shine B/ set in order, C/sort, D/ standardize
5. ___ means arranging something items? A/ shine B/ set in order, C/sort, D/ standardize

Instruction III: give your short Answer for the following questions.

You are provided 4 minute for each question.

1. Define the term set in order as a kaizen practice?(4marks)
2. List at least two main target of set in order?(4marks)

Operation Sheet 3	
Operation Title	set in order
Purpose	To understand the skill of set in order on the wet processing/targeted place, practical class room,environment,compound.
Instruction	By using the given chemicals recipe which is found in procedure the dyeing set in order operation.
Tools, Equipment and Materials	Weighing balance,Gray fabric, Ruler,Pencil/pen/marker,Record book/Agenda,Meter,Spoon ,Beaker,Stirrer,Thermometer,PH indicator/litmus paper,Oven dryer,Stove and Cutter, Shelf, kaizen board, and kaizen manual.
Precautions	→ Follow the correct procedure/steps in listed bellow. → Perform the given operation based on the operational requirement including by applying sset in order.
Procedures in doing the task	→ Review the procedure and learning guide manual → Identify necessary equipment & tools → Follow the procedure which is found bellow “B”correctly
Conditions or situations for the operation	→ The practical class room (dyeing laboratory) safe and well organized. → The class room must be suitable and chemicals set in order in the lab shelf. → Instruments and machineries available in working lab (safe arrangement).
Quality criteria	→ Apply set in order activity.

- **Procedure “B”**

Step1. Prepare kaizen board.

Step2, Clean the room and the environment

Step3, Plan the cleaning schedule based on the the order of the the Trainner/Instructor.

Step4,Check the system which is doing based on the current situaion.

Step5,Return the whole hand tools,equipments, and other things which is use for preparation.

LAP Test

Task 1: Clean and set in order the wholee environmet.

Task2:Measure the necessary things/raw materials

Task3: Apply sorting and set in order activity based on the the order of the the Trainner/Instructor

Task4: Add the prepared recipe, mix fabric with beaker and apply reactive dye.

Task,Return the whole hand tools,equipments, and other things which is use for preparation.

k 5: Check the system putting orderly.

Note: Satisfactory rating – above 60% Unsatisfactory - below 60%

You can ask you teacher for the copy of the correct answers

Unit Four: Shine activities

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

- shine activities
- necessary tools and equipment
- Implement shine activity
- Report results and Conduct regular shining activities

This unit will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to

- Planning shine activities
- Prepare and use necessary tools and equipment
- Implement shine activity
- Report results and Conduct regular shining activities

2.9. Shine activity

Design how to clean may seem obvious, but make sure people know how to properly shine their spaces. Show employees, especially new employees, which cleaners to use, where cleaning materials are stored, and how to clean equipment, particularly if it's equipment that could be easily damaged.

2.10. Necessary tools and equipment

Buying cleaning products may not be the most exciting part of setting up a new home, but it's essential to your quality of life, and a good deep clean is a lot easier when you have the right supplies on hand.



Figure 4.1 necessary tools and equipment

- Scrub brushes
- Multi-purpose duster
- Sponges
- VacuumSpray bottle
- Microfiber cleaning cloths
- Broom and dustpan
- Mop Bucket
- Cleaning solutions
- Gloves

2.11. Implement shine activity

The third step of 5S is Shine, or “seiso,” which means “cleanliness.” While the first and second steps cleared up space and arranged the area for efficiency, this step attacks the dirt and grime that inevitably builds up underneath the clutter, and works to keep it from coming back.



Figure 4.2 implemnt floor shine activity

Everyone thinks they know what housekeeping is, but it's one of the easiest things to overlook, especially when work gets busy. The Shine stage of 5S focuses on cleaning up the work area, which means sweeping, mopping, dusting, wiping down surfaces, putting tools and materials away, etc.



Figure 4.3 implemnt machine shine activity

In addition to basic cleaning, Shine also involves performing regular maintenance on equipment and machinery. Planning for maintenance ahead of time means businesses can catch problems and prevent breakdowns. That means less wasted time and no loss of profits related to work stoppages.

Shining the workplace might not sound exciting, but it's important. And it shouldn't just be left up to the janitorial staff. In 5S, everyone takes responsibility for cleaning up their workspace, ideally daily. Doing so makes people take ownership of the space, which in the long run means people will be more invested in their work and the company. Clean and remove all trash, grease, and dirt. Everything must be clean, tidy, and neatly put in its appropriate place. Cleanliness provides a safe workplace and makes potential problems noticeable, e.g., equipment leaks, loose parts, missing guards, loose paperwork, or materials.



Figure 4.4 implemnt cloth shine activity

2.12. Report results and Conduct regular shining activities

Everyone should pay attention to the overall cleanliness of the workplace, being willing to pick up trash and so on. But for 5S to give the best results, each worker should take personal responsibility for their own working space. Keeping work areas clean will have many advantages. One important advantage is that it's easy to spot leaks, cracks, or misalignments. If the people keeping the area clean are the same people who work there regularly, they will be quick to recognize any of these problems. Leaving those problems unnoticed and unresolved could result in equipment failure, safety hazards, and loss of productivity. With the constant cleaning and inspections used in the Shine step of 5S, the system can feed into a preventative maintenance program. This way, 5S can extend the working life of equipment and help reduce emergency downtime. Preventing Objects from getting broken by being left unattended broken items are repaired immediately or replaced with new items. In this situation everybody or stack holder, owner, e.t.c. attentively report the result and conduct for regular activity as a habit.



Figure 4.5 report results and Conduct regular shining activities

Self-check-4

Instruction I: write if the statement is correct say true or if the given statement is not correct say false

1. shine is the 2nd action from five components of 5S.(2 marks)
2. Putting randomly is better based on the kaizen principles.(2 marks)

Instruction II: choose the best answer from the following alternative.

1. Which activity is 2nd from 5s components? A/ sort B/ set in order, C/shine, D/ standardize
2. ___ means arranging something items? A/ shine B/ set in order, C/sort, D/ standardize

Instruction III: give your short Answer for the following questions. You are provided 4 minute for each question.

1. Define the term shine as a kaizen practice?(4marks)
2. List at least two main target of shine?(4marks)

Operation Sheet 4	
Operation Title	shine
Purpose	to understand the skill of shine.
Instruction	By using the given chemicals recipe which is found in procedure the dyeing shine operation.
Tools, Equipment and Materials	Weighing balance, Gray fabric, Ruler, Pencil/pen/marker, Record book/Agenda, Meter, Scrub brushes, Multi-purpose duster, Sponges, Vacuum Spray bottle, Microfiber cleaning cloths, Broom and dustpan, Mop Bucket, Cleaning solutions, Gloves paper, Oven dryer, Stove and Cutter, Shelf, kaizen board, and kaizen manual.
Precautions	→ Follow the correct procedure/steps in listed bellow. → Perform the given operation based on the operational requirement including by applying shine.
Procedures in doing the task	→ Review the procedure and learning guide manual → Identify necessary equipment & tools → Follow the procedure which is found bellow “D” correctly
Conditions or situations for the operation	→ The practical class room (dyeing laboratory) safe and well organized. → The class room must be suitable and chemicals shine in the lab shelf. → Instruments and machineries available in working lab (safe arrangement).
Quality criteria	→ Apply shine activity.

Procedure “D”

Step1. Prepare kaizen board.

Step2, Clean the room and the environment

Step3, Plan the cleaning schedule based on the the order of the the Trainner/Instructor.

Step4,Check the system which is doing based on the current situaion.

Step5,Return the whole hand tools,equipments, and other things which is use for preparation.

LAP Test

Task 1: Clean and shine the wholee environmet.

Task2:Measure the necessary things/raw materials

Task3: Apply shine activity based on the the order of the the Trainner/Instructor

Task4: Add the prepared recipe, mix fabric with beaker and apply reactive dye.

Task,Return the whole hand tools,equipments, and other things which is use for preparation.

k 5: Check the system putting orderly.

Note: Satisfactory rating – above 60% Unsatisfactory - below 60%

You can ask you teacher for the copy of the correct answers

Unit Five: Standardize 5S

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

- standardize 5S activities
- standardize activities checklists
- Keep standard workplace
- Avoid problems standard activities

This unit will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to

- standardize 5S activities
- standardize activities checklists
- Keep standard workplace
- Avoid problems standard activities

2.13. Standardize 5S activity

The term standardize means engage the workforce to systematically perform steps sort, set in order and shine, above daily, to maintain the workplace in perfect condition as a standard process. Establish schedules and set expectations for adherence. In other words the first three steps of 5S cover the basics of clearing, organizing, and cleaning a work space; on their own, those steps will provide short-term benefits. The fourth step is Standardize, or “Seiketsu,” which simply means standardization. By writing down what is being done, where, and by whom, you can incorporate the new practices into normal work procedure. This paves the way for long-term change.



Figure 5.1 Standardize 5S

2.14. Implementing tools and techniques

Standardization denotes fixing specifications, using rules and procedures. Standardization is the key to maintain high standards of efficiency at work, ensuring visibility in the workplace can guarantee that the necessary measures are taken immediately.



Figure 5.2 Scrub brushes

A. Scrub brushes

Get yourself at least one great cleaning brush. A plastic one with strong bristles and a handle with a rubber grip is enough to tackle most messes, including scrubbing a bathtub or sink. Consider buying a brush set that comes with multiple brush heads so you can tackle different spaces.



Figure 5.3 Multi-purpose duster

B . Multi-purpose duster

An extendable wand duster will serve you well once you notice the cobwebs gathering on the ceiling fan in the living room. Look for one that has a pivoting head and enough length to reach your ceiling height, and you'll never have to worry about how to dust those tough-to-reach nooks and crannies.



Figure 5.4 Sponges

C. Sponges

For doing dishes, look for sponges that have a soft side for delicate dishes and a rough side to blitz stuck-on food. Use non-metal, non-abrasive sponges to clean cast iron cookware, if you have it. Purchase heavy-duty sponges made of tough material for floor cleaning, ovens, and other surfaces that need a thorough scrubbing.



Figure 5.5 Vacuum

D. Vacuum

Your vacuum is your secret weapon to tidy up quickly and keep dust at bay. When choosing one, think about your space and needs. If you're short on storage space, consider a cordless stick vacuum that can be hung up behind a door. If you're in a tiny space, there are small handheld vacuums that are great for sucking up spills.



Figure 5.6 Spray bottle

E. Spray bottle

When you're trying to evenly distribute cleaning solutions, a regular water bottle won't do the trick. Invest in a few glass spray bottles and you'll always have an easy way to kick off a cleaning spree.



Figure 5.7 Microfiber cleaning cloths

F. Microfiber cleaning cloths

Microfiber cloths are gentle on surfaces and ideal for picking up dust. They're perfect for tidying up flatscreens or furniture, and they don't leave streaks on mirrors or stainless steel.



Figure 5.8 Broom and dustpan

G. Broom and dustpan

A broom and dustpan are essential for cleaning up spills, such as a knocked-over box of cereal on the wet process floor, or sweeping up clippings on your patio. They're also great for doing a little pre-cleaning before you vacuum.



Figure 5.9 Mop

H. Mop

A mop is your go-to tool for cleaning hard floor surfaces like tile, wood, or laminate and making them shine. You can buy one that has a handle you can fill with cleaning fluid, or a simple stick mop with a sponge head.



Figure 5.10 Cleaning solutions

I. Cleaning solutions

A trip to the cleaning products aisle can be a bit daunting because there are so many choices. Note that store-bought multi-purpose cleaners may not be suitable for tasks like cleaning stainless steel, so make sure to check the label before you spray on different materials.



Figure 5.11 Gloves

K. Gloves

Cleaning fluids, hot water, and soap scums can be tough on your hands, so take care to protect them. Invest in a pair of sturdy rubber gloves that will help you tackle messier home cleaning tasks with confidence. Methodology of 5S and have at their disposal all the required information. There must be a communication between different departments of the company, in order to leverage the interest of all those who are not convinced. Standardization of 5S activities refers to normal working activities and consists in developing work instructions: color schemes, aisle marking, cleanliness standards and cleaning schedules.

5S checklists

5S Transactional Assessment							
Work Area:		Key: Use sheet to rate work area 5 times (note each date) 1 = "non-existent", 3 = "average" and 5 = "excellent"					
5S Phase	Definition	Standards To Be Met	Ratings			Next Steps	
Date of Assessment							
Sort (Seiri)	The right materials are available and anything unnecessary is removed	- No unused items are stored					
		- No unneeded materials, forms or supplies					
		- There are no out-of-date posters on the wall					
		- Excess supplies are reallocated					
Set in Order (Seiton)	There is place for everything and everything is in its place	- It's clear where working vs archive files belong					
		- The shared drive is easy to navigate					
		- Signage & naming conventions are clear					
		- Equipment and supply areas are clearly labeled					
Shine (Seiso)	Everything is clean and in working order	- IT conducts regular maintenance					
		- Licenses are renewed and updated on schedule					
		- Systems suffer minimal downtime					
		- Employees have access to the right applications					
Standardize (Seiketsu)	Guidelines and practices are established to maintain first three steps	- 5S activities and locations are clearly outlined					
		- Audit forms and checklists exist					
		- There is a 5S schedule & responsibilities are clear					
		- Quantities and limits are clearly marked					
Sustain (Shitsuka)	5S is a habit that people incorporate into their daily practice	- Leadership enforces 5S habits					
		- There is accountability for ongoing 5S practices					
		- 5S results are prominently displayed					
		- Employees are recognized for 5S practice					
Total Score			0	0	0	0	0

Figure 5.13 checklist

Procedure labels and signs – Provide operating instructions, cleaning steps, and preventative maintenance procedures right where that information will be needed.



Lab Management of Printing and Dyeing Factory

Self-check-5

Instruction I: write if the statement is correct say true or if the given statement is not correct say false

1. Sustain is the 2nd action from five components of 5S.(2 marks)

1. Putting orderly one of the key role of kaizen principles.(2 marks)

Instruction II: choose the best answer from the following alternative.

1. ___ Which activity is 3rd from 5s components? A/ shine B/ set in order, C/sort, D/ standardize

2. ___ means arranging something items? A/ shine B/ set in order, C/sort, D/ standardize

Instruction III: give your short Answer for the following questions. You are provided 4 minute for each question.

1. Define the term sustain as a kaizen practice?(4marks)

2. List at least two main target of sustain?(4marks)

Operation Sheet 5	
Operation Title	Standardize
Purpose	to perform the skill of Standardize the whole system.
Instruction	By using the given chemicals recipe which is found in procedure the dyeing make it as it is standardize system.
Tools, Equipment and Materials	Weighing balance, Gray fabric, Ruler, Pencil/pen/marker, Record book/Agenda, Meter, Scrub brushes, Multi-purpose duster, Sponges, Vacuum Spray bottle, Microfiber cleaning cloths, Broom and dustpan, Mop Bucket, Cleaning solutions, Gloves paper, Oven dryer, Stove and Cutter, Shelf, kaizen board, and kaizen manual.
Precautions	→ Follow the correct procedure/steps in listed bellow. → Perform the given operation based on the operational requirement including by applying standardize.
Procedures in doing the task	→ Review the procedure and learning guide manual → Identify necessary equipment & tools → Follow the procedure which is found bellow “E” correctly
Conditions or situations for the operation	→ The practical class room (dyeing laboratory) safe and well organized. → The class room must be suitable and chemicals shine in the lab shelf. → Instruments and machineries available in working lab (safe arrangement).
Quality criteria	→ Apply /make/ it as it is standardize system.

Procedure “E”

Step1. Prepare kaizen board.

Step2, Clean the room and the environment

Step3, Plan the cleaning schedule based on the the order of the the Trainer/Instructor.

Step4,Check the system which is doing based on the current situaion.

Step5,Return the whole hand tools,equipments, and other things which is use for preparation.

LAP Test

Task 1: Clean and sustain the wholee environmet.

Task2:Measure the necessary things/raw materials

Task3: Apply sustain and standardize based on the the order of the the Trainer/Instructor

Task4: Add the prepared recipe, mix fabric with beaker and apply reactive dye.

Task,Return the whole hand tools,equipments, and other things which is use for preparation.

k 5: Check the system putting orderly.

Note: Satisfactory rating – above 60% Unsatisfactory - below 60%

You can ask you teacher for the copy of the correct answers

Unit Six: Sustain 5s

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

Sustain 5S

implement Tools and techniques

standard and sustainable workplace

Cleaning workplace

Recommending Improvements

Checklists and reporting

Avoiding Problems by sustaining activities

This unit will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to

Plan and follow 'sustain 5S' activities

Discuss, prepare and implement Tools and techniques

Inspect standard and sustainable workplace

Clean workplace

Recommending Improvements

Follow Checklists and reporting

Avoid Problems by sustaining activities

6.1 Sustain 5S

Organizations can create a clean, well ordered, and disciplined work environment. Many companies implement only the first three steps, hoping the last two will automatically follow.



Figure 6.1 sample of sustain

The step Sustain, or “shitsuke,” which literally means “discipline.” The idea here is continuing commitment or improvement. It’s important to follow through on the decisions that you’ve made and continually return to the earlier steps of 5S, in an ongoing cycle. Sustainment is usually the most difficult part of 5S. For a good sustenance and discipline, there are some aspects to improve:

- Understand the „empathy" concept as the ability to imagine you could be in that situation
- Develop collegiality at work, and share information with others
- Create conditions for each employee to apply what he had learned

All activities and attitudes should be standardized and repeated until they get to be part of the company culture. It is an eminently a human stage that cannot be automated

Never “Once and Done”

The 5S approach was never meant to be a one-time event, but an ongoing cycle. This is key, because early successes in 5S can open the way for problems. If open space becomes available in the Sort step, but afterward, tools and materials are allowed to gradually fill in that space without any organization, the end result can be an even bigger mess. The solution is to apply the ideas of 5S over and over, as a routine part of normal work. That’s why Sustain is so important sustaining a 5S program can mean different things in different workplaces, but there are some elements that are common in successful programs.

6.2 Implement Tools and techniques

Buying cleaning products may not be the most exciting part of setting up a new home, but it's essential to your quality of life, and a good deep clean is a lot easier when you have the right supplies on hand.



Figure 6. 2 Implement Tools and techniques

- Scrub brushes
- Multi-purpose duster
- Sponges
- VacuumSpray bottle
- Microfiber cleaning cloths
- Broom and dustpan
- Mop10. Bucket
- Cleaning solutions and Gloves

6.3 Standard and sustainable workplace

While it's the last step in the sequence, Sustain is not the end of 5S as a whole. One pass through the steps can expose problems that were hidden beforehand. Following the steps again can resolve those problems, and help discover new ways to improve. Continue through the cycle again and again to keep your facility at the top of its potential. When it comes to lean manufacturing and workplace improvement, 5S is one of the most widely known and used lean tools. It's no surprise: 5S can increase workplace efficiency, reduce costs, and improve quality. But with many lean programs, it's easy to focus only on those goals, and lose sight of the human factor. Worker safety is critical. That's why many facilities add another step to the 5S cycle, calling the result "6S" with Safety.

Unlike the first five steps, Safety is not a sequential step. It must be considered during each of the other steps. During the Sort phase, for example, you might decide that a given tool is obsolete because a newer version is safer to use.



Figure 6. 3 standard and sustainable work place

Likewise, during the Standardize step, work procedures need to be standardized to improve workplace safety, not just efficiency. Because 5S focuses on improving a workplace, and different workplaces may have little in common, it can be hard to predict the exact results of using the program.

6.4 Cleaning workplace

Cleaning is a system cleaner removes unnecessary files from targeted (wet processing area) when it is run. It takes care of temporary files like Internet browsing caches or leftovers after Windows Updates activities.



Figure 6. 4 Cleaning workplac

6.5 Recommending improvement

A. Sustaining stage

Different sustaining techniques for 5S that will be described in the following sections are used at this stage. This stage means performing the activities repeatedly and patiently in order to sustain 5S activity. Success of 5S depends on supervisor's ability to sustain the gains acquired from 5S activity.

The size of a Kaizen board should be 2 times a flip chart paper. It has four corners or parts depending on the information displayed.

- The “staff performance corner” shows the actual performance of the staff and the gaps and training needs. The staff performance can be shown on the Kaizen board using different colors such as red for low performer, blue for average performer, and green for best performer.
- The “Kaizen plans & results corner” shows the results generated from implementing Kaizen activities. Improvement graphs can be displayed and should be updated regularly at least on weekly basis. If the results are below the planned target, the team has to discuss and find the root cause and implement solution.
- The “suggested problems corner” is the place where every team members' ideas or identified problems are posted. The posted problems have to be discussed and solved by the teams and the solutions should be displayed on the next corner i.e. “suggested solutions corner”.

5S is a visual management tool and a structured methodology in creating best practice, clean, organized and efficient working environment. 5S can assist with the elimination of frustration, confusion, Stress, space limitation and inventory management. 5S is a great way to manage your laboratory. Being organized is about working smarter not harder and helps to create a safer workplace, reduce processing time, improve communication, eliminate errors, utilize space effectively and improve morale.



Figure 6.5 Comparing before and after applying kaizen.

6.6 Standardize activities checklists

Table 6.checklist & reporting

	A	B	Evaluation items	Evaluation po	Remarks about problems
Seiri	<input type="radio"/>		1) Necessary things and unnecessary things can be identified easily.		
	<input type="radio"/>		2) Unnecessary things are discarded, or clarified in time limit for handling.		
	<input type="radio"/>		3) Quantity of each thing is kept as specified.		
	<input type="radio"/>		4) Bulletins and control sheets are replaced with updates.		
			Subtotal		
Seiton	<input type="radio"/>		5) Things are located at each given place.		
	<input type="radio"/>		6) Fixed positions of things are clarified by signboard, delineating, etc.		
	<input type="radio"/>		7) Things are positioned so as to facilitate first-in first-out system.		
	<input type="radio"/>		8) Small improvement realizes easy transfer of things into and from each given place.		
			Subtotal		
Seiso	<input type="radio"/>		9) There are no stain, trash, dust, etc. (facilities, floor, building, lighting, etc.)		
	<input type="radio"/>		10) Upstream solutions are provided against stain, trash, dust, etc.		
	<input type="radio"/>		11) Voluntary inspection of facilities is conducted.		
	<input type="radio"/>		12) Processes, aisles, etc. are delineated with paint colors, etc. so that cleaning area can be easily identified.		
	<input type="radio"/>		13) There are no stain/separation/unevenness/cracks in painted/delineated part on the floor.		
	<input type="radio"/>		14) There are no obstacles on aisles. (carts, pallets, parts, etc.)		
	<input type="radio"/>		15) Cleaning is facilitated with creative efforts.		
		Subtotal			
Seiketsu	<input type="radio"/>		16) Judgment criteria for necessary/unnecessary things are specified.		<div style="border: 1px solid black; padding: 5px; width: fit-content;"> Items to evaluate the system of 3S (Red Tag Operation, Signboard Operation, and Tidy-it-Up Operation) </div>
	<input type="radio"/>		17) Judgment criteria for disposing unnecessary things are specified.		
	<input type="radio"/>		18) Quantities of necessary things are specified.		
	<input type="radio"/>		19) Fixed positions of necessary things are specified by signboards, layout chart, etc.		
	<input type="radio"/>		20) Heights of racks, etc. are specified.		
	<input type="radio"/>		21) Method/procedure/responsible person/time frame of cleaning are specified.		
	<input type="radio"/>		22) Contents/procedure/responsible person/time frame of voluntary facility inspection are specified.		
	<input type="radio"/>		23) Workers keep neat appearance and have no stain on their clothes, etc.		
	<input type="radio"/>		24) Progress/normality/abnormality in 3S (Seiri, Seiton, Seiso) can be easily identified.		
	<input type="radio"/>		25) Comfortable worksite is maintained through repeated 3S activity.		
		Subtotal			
Shitsuke	<input type="radio"/>		26) Annual policy for 5S activity is set.		
	<input type="radio"/>		27) Annual basic plan for 5S activity is set.		
	<input type="radio"/>		28) 5S activity plan is set for each worksite.		
	<input type="radio"/>		29) Awareness campaign, education, events, and patrols are included in activity plan.		
	<input type="radio"/>		30) 5S evaluation sheet is specially prepared for each worksite.		
	<input type="radio"/>		31) Supervisor prepares "Shitsuke Evaluation Sheet" for workers.		
	<input type="radio"/>		32) Supervisor repeatedly instructs workers on their weak points in Shitsuke.		
	<input type="radio"/>		33) Patrols by the person in each duty position are provided.		
	<input type="radio"/>		34) Responsible persons for patrols properly give advices and take actions.		
	<input type="radio"/>		35) Activity bulletin board is efficiently utilized for timely notice and understandability.		
<input type="radio"/>		36) Bottom-up activities such as small improvements are invigorated.			
		Subtotal			
				Total	/105
				Achievement rate	%

A: Evaluation of appearance
B: Evaluation of system completion

<Evaluation criteria>

Grade the results of each activity in each evaluation item on a scale of zero to three as follows:

3 points	85% or more
2 points	60% or more but less than 85%
1 point	30% or more but less than 60%
0 point	Less than 30%

Figure 6.6 checklists and reports

6.7 Avoiding waste things

Avoiding waste things by using 5s (by sort, set, & shine parameter)

And then remove unwanted materials.

Problems by sustaining activities



Figure 6.7. Chemical Laboratory store without kaizen

6.8 Conclusion

5S can be considered a philosophy, a way of life, which can raise the morale and create a good impression to customers and enhance the efficiency. Any company that applied the 5S program will have quick and visible results, reducing different types of waste, in respect of lean manufacturing principles, removing all the forms of waste from the value stream (cycle time, labor, materials, and energy).

The benefits of applying this method in the company are the following:

- support the timely delivery;
- improve the products quality and reduce the number of defects;
- increase the productivity;
- reduce the loss of material, time and space (prevents waste);
- reduce the warehousing and inventory costs;
- reduce the downtime due to equipment malfunction, and increase employment security.

The employees will feel more comfortable at work and the continuous improvement actions will lead to less waste and better quality, affecting the company's profitability and competitiveness.



figure 6.8 conclusion 5s

Self -check-6

InstructionI: write if the statement is correct say true or if the given statement is not correct say false

1. Sustain development is the 2nd action from five components of 5S.(2 marks)
2. Putting randomly is better based on the kaizen principles.(2 marks)

InstructionII: choose the best answer from the following alternative.

1. ___ Which activity is 2nd from 5s components? A/ shine B/ set in order, C/sort, D/ standardize
2. ___ means arranging something items? A/ shine B/ set in order, C/sort, D/ standardize

InstructionIII: give your short Answer for the following questions. You are provided 4 minute for each question.

1. Define the term sustain as a kaizen practice?(4marks)
2. List at least two main target of sustain?(4marks)

Operation Sheet 6	
Operation Title	Sustain
Purpose	to perform/keep/ it with sustain development.
Instruction	By using the given chemicals recipe which is found in procedure the dyeing keep up or in sustain development.
Tools, Equipment and Materials	Weighing balance, Gray fabric, Ruler, Pencil/pen/marker, Record book/Agenda, Meter, Scrub brushes, Multi-purpose duster, Sponges, Vacuum Spray bottle, Microfiber cleaning cloths, Broom and dustpan, Mop, Bucket, Cleaning solutions, Gloves, paper, Oven dryer, Stove and Cutter, Shelf, kaizen board, and kaizen manual.
Precautions	→ Follow the correct procedure/steps in listed bellow. → Perform the given operation based on the operational requirement including by applying keep up or in sustain development.
Procedures in doing the task	→ Review the procedure and learning guide manual → Identify necessary equipment & tools → Follow the procedure which is found bellow “F” correctly
Conditions or situations for the operation	→ The practical class room (dyeing laboratory) safe and well organized. → The class room must be suitable and chemicals shine in the lab shelf. → Instruments and machineries available in working lab (safe arrangement).
Quality criteria	→ Apply keep it up/make/ or in sustain development.

Procedure “F”

Step1. Prepare kaizen board.

Step2, Clean the room and the environment

Step3, Plan the cleaning schedule based on the the order of the the Trainer/Instructor.

Step4,Check the system which is doing based on the current situaion.

Step5,Return the whole hand tools,equipments, and other things which is use for preparation.

LAP Test

Task 1: Clean and set in order the wholee environmet.

Task2:Measure the necessary things/raw materials

Task3: Apply sorting and sustain development based on the the order of the the Trainer/Instructor

Task4: Add the prepared recipe, mix fabric with beaker and apply reactive dye.

Task,Return the whole hand tools,equipments, and other things which is use for preparation.

k 5: Check the system putting orderly.

Note: Satisfactory rating – above 60% Unsatisfactory - below 60%

You can ask you teacher for the copy of the correct answers

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