HORTICULTURAL CROPS PRODUCTION

LEVEL -I

Learning Guide -07

Unit of Competence: Apply 3S

Module Title: Applying 3S

LG Code: AGR HCP1 M03 LO1-LG07

TTLM Code: AGR HCP1TTLM1219v1

LO1: Organize Junior Kaizen Promotion Team (KPT)

Instruction Sheet	Learning Guide -07

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

- Identifying basics, principles and stages of KPT.
  - ✓Basics of KPT
  - ✓Stages of KPT
  - ✓Kaizen principle, pillars and concept
  - ✓Key characteristic of Kaizen
- Establishing structure of Junior KPT.
- Making effective and appropriate contributions to team activities and objectives.
- Using effective and appropriate forms of communications.
- Preparing and using Kaizen Board (Visual Management Board).

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 –**

- Identify basic, principles and stages of KPT.
- Establish structure of Junior KPT.
- Make effective and appropriate contributions to team activities and objectives.
- Use effective and appropriate forms of communications.
- Prepare and use Kaizen Board (Visual Management Board).

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 3 to 7.
3. Read the information written in the “Information Sheets 1”. Try to understand what are being discussed. Ask your teacher for assistance if you have hard time understanding them.
4. Accomplish the “Self-check 1 to 5 **on page -.** 13,18,27,30 and 32 respectively
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-check 1).
6. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.

7. Do the lab test on page 32

Information Sheet-1	Identifying basics, principles and stages of KPT

1. Kaizen Basics

1.1 The Meaning of Kaizen

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.”

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".

1.2 The Stages of KPT

Kaizen developed and spread in Japan and later to the world in four phases.
Phase 1 - 1950s (end of world war II): This phase was the absorption of foreign technique by Japan to make improvements and catch-up with the international industrial development. Because, at this time products made by Japan were known as low quality and low price in the world market.

Many companies developed their own systems of kaizen, including the globally known Toyota Production System (TPS) developed by the Toyota Motor Corporation.

Phase 2 - 1970s -180s: This phase was the diffusion of Kaizen among Japanese companies, including small and medium sized companies. This led to a rapid increase in the number of Quality Control Circles (QCC).

Phase 3 - mid 1980s: through Japanese firms abroad and various public organizations Kaizen spread in the world. In 1985 Japanese manufacturing companies shifted their production bases to East Asia where they introduced kaizen philosophy and practices.

Phase 4 – In this phase Kaizen diffused to developing regions in Latin America & Eastern Europe including Africa (mainly in Sub-Saharan Africa). East Asia together with the Japanese government's TICAD IV initiative for promoting trade and investment in Africa an opportunity was provided for Japan to more actively publicize and introduce kaizen in developing regions. Kaizen also spread through Imai's first book- 'Kaizen: The Key to Japan's Competitive Success' published on 1986. Most Japanese enterprises are now endowed with world-leading capability.

JICA (Japan International Cooperation Agency) has also offered assistance for Kaizen to many developing countries. JICA's assistance with Kaizen started in Asian countries like Singapore in 1983 than in Malaysia, Philippines, Thailand, Indonesia and Vietnam. And, in Latin America countries like Costa Rica, Chile, Argentina, Paraguay, Brazil and Mexico, In Eastern European Countries like Poland, Hungary, Baltic countries (Estonia, Latvia, Lithuania), Armenia, Bosnia Herzegovina, and Serbia.

a) Clarification of safety passages

b) b) Visual Control Board

Fig 1.1 Clarification of safety passages and Visual Control Board

JICA Kaizen assistance in Africa started in Egypt, Tunisia, and then in Ethiopia**,** Kenya, Zambia, Ghana, Tanzania.

1.3 Kaizen principle, pillars and concept

A. guiding principles of kaizen :

- Proactive and spontaneous participation of front-line workers (they are centre of Kaizen activities).
- Focus on the improvements of workplace/Gemba (the foundation of all the improvement efforts). It is a key entry to endless revolving activities of Kaizen.
- Practicing kaizen that lead to a corporate culture.
- Kaizen fosters process as well as result oriented thinking.
- Speak with data - collect, verify and analyse data.
- Put quality first even than cost and delivery.
- Bottom-up approach i.e. integrated total company approach: genuine participation of top management, middle managers and front-line employees in a collaborative working system throughout company organizations
- Continuous and endless activities in revolving cycles of PDCA resulting in significant improvements.
- Top management commitment.
- Learning process and customization
- Customer satisfaction

Kaizen is crucial for any sector because factories and organizations of any sector are like living organisms. The healthiest organisms move and change in a flexible manner in accordance with their environment.

In the business world:

- ✓ Customer needs are always changing,
- ✓ New technologies are continually being developed and
- ✓ Generations after generation of new products appear on the market.

Sales competition is becoming tougher each year as companies strive to manufacture more sophisticated products at lower cost. The same is true with the service providing industries. In the presence of these challenges, therefore factories or organizations must find new ways to ensure their survival by adapting to the changing business environment. They must move beyond old organizational concepts and customs that no longer apply and must adopt new methods that are appropriate to the new times.

one of the objectives of a company is increasing profits. If sufficient profits are generated, the continuation of a company and the living conditions of its employees also ensured.

- ✓ Quality,

- ✓ cost reduction, and
- ✓ delivery time

Are the three biggest contributors to the profit increase through elimination of wastes/Muda.

In general Kaizen is indispensable to:

- ✹ Make optimal use of peoples' skills
- ✹ Reduce overall cost
- ✹ Maintain high quality (or improve quality)
- ✹ Reduce or eliminate wastes (MUDA)
- ✹ Improve productivity
- ✹ Improve Safety
- ✹ Shorten lead time & improve delivery time
- ✹ Improve space utilization etc

Masaaki Imai proposed Kaizen as "the unifying thread running through the philosophy, the systems, and problem solving tools developed in Japan over the last 30 years".

B. **The three pillars of Kaizen are:**

1) As a philosophy
2) Kaizen systems
3) Kaizen tools

1.3.1 Kaizen as a Philosophy

Kaizen is a philosophy of continuous undertaking by an organization to improve its activities and processes with the goal to always improve Kaizen elements:

- ✓ Productivity,
- ✓ Quality,
- ✓ Cost,
- ✓ Delivery time,
- ✓ Moral,
- ✓ Safety,
- ✓ Environment and
- ✓ Gender equality

Kaizen starts with the recognition that any corporation has problems and it solves these problems by:

- Establishing corporate culture
- Following a customer-driven strategy to increase customer satisfaction. Management's role should be to make a constant effort to provide better products at lower prices. Management should devote at least 50 percent of its attention to Kaizen.
- Emphasizing on process or process-oriented way of thinking.
- Supporting and acknowledging people's process-oriented efforts for improvement rather than evaluating people's performance on the basis of results.

Kaizen as a philosophy is built-in and run through guiding principles. These guiding principles can be summarized as follows:

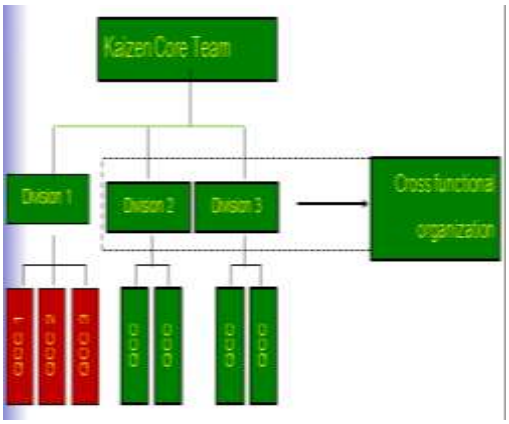
- Improve everything continuously.
- Abolish old, traditional concepts.
- Accept no excuses and make things happen.
- Say no to the status quo of implementing new methods and assuming they will work.
- If something is wrong, correct it.
- Empower everyone to take part in problem solving
- Proactive and spontaneous participation of front-line workers (they are centre of Kaizen activities).
- Focus on the improvements of workplace/Gemba (the foundation of all the improvement efforts). It is a key entry to endless revolving activities of Kaizen.
- Practicing kaizen that lead to a corporate culture.
- Kaizen fosters process as well as result oriented thinking.
- Speak with data - collect, verify and analyse data.
- Put quality first even than cost and delivery.
- Bottom-up approach i.e. integrated total company approach: genuine participation of top management, middle managers and front-line employees in a collaborative working system throughout company organizations
- Continuous and endless activities in revolving cycles of PDCA resulting in significant improvements.
- Top management commitment.

- Learning process and customization
- Customer satisfaction

1.1.4. Key characteristic of Kaizen

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.

- ***Continuity:*** Kaizen is a dynamic activity in revolving cycles of PDCA (Plan, Do, Check and Act). Once a new improvement becomes a new standard, the next cycle is set up to seek further improvement. Kaizen is a continuous challenge towards ever higher-level improvement, cycle by cycle, without an end.
- ***Participatory approach:*** Kaizen is built in and run with an integrated and company-wide approach through the collaboration of all the levels of the organisation that are top management, middle managers and front-line employees. Commitment, genuine participation and motivation of all the three actors are critical factors. As shown in diagram 1 Kaizen core team is a team of the management bodies of an organization whose duties are to lead and direct all teams established in each department and cross functional teams with members from different departments. Cross functional teams are formed to solve problems that cannot be solved by departments. Diagram 2 shows Kaizen dissemination in an organization by selecting and implementing Kaizen in sample and model work areas and then building on and expanding the success in company-wide scale. For fruitful participation, giving training and education as well as communication is very important. To utilize individual workers ideas suggestion system can be introduced.



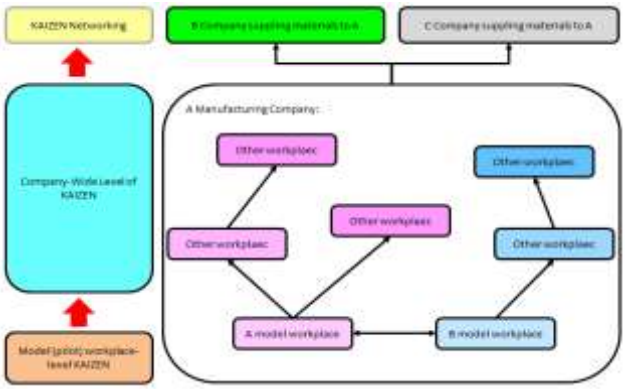


Diagram 1: Core team, cross functional team and and Institutionalisation

Diagram 2: Kaizen dissemination QCC (Quality Control Circles)

- ***Accumulation of small Improvement:*** Japanese people say “accumulation of a small dust builds a mountain”. Significant and greater results can be attained through accumulation of small improvements or by carrying out repeatedly minor or small improvements as opposed to innovation.

- ***Needs small investment:*** Waste elimination may not require investment or may require little investment through the introduction of basic Kaizen technique such as 5S. To conduct 5S i.e. to sort or separate necessary and unnecessary items , to set or place items in locations suitable for work and to shine or clean: red tags, paint, shelves, racks, display boards and cleaning materials etc. are needed which can be bought with small investment. A company shouldn’t have to make large investment to buy machines and make Kaizen/improvements. If machines are used before eliminating wastes from the work area and operations, this will lead to the mechanization of wasteful operations. There will not be a value adding works in the company.
- ***Widely Applicable:*** Kaizen refers to a philosophy or practices that focus upon continuous improvement in manufacturing activities, business activities, and even life in general, depending on interpretation and usage. It is widely applicable in manufacturing, service, public or non-profit organizations and others. Kaizen techniques are now universally applicable to all sectors.

Requisites of Kaizen: to understand and successfully implement Kaizen the following Kaizen requisites should be fulfilled.

- ***K****nowledge 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.
- ***A****ttitude 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.

- ***I**nvolvement 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

- ***E**ducation about Kaizen (training):* Kaizen is human-oriented i.e. it is implemented by employees therefore education or training about Kaizen is vital.
- ***N**ever-ending activity:* Kaizen is continuous and practical, aiming always for best improvement through accumulation of small improvements.

Self-Check 1	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Define the word Kaizen? (3 points)
2. Write the origin of Kaizen? (6 points)
3. What are the three pillars of Kaizen? (3 points)
4. What are the characteristics of Kaizen? (5 points)
5. What are the principles and benefits of Kaizen? (6 points)
6. List the elements of Kaizen. (8 points)

Note: **Satisfactory rating - 20 points** **Unsatisfactory - below 20 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-2	Establishing structure of Junior KPT

2.1. Junior Kaizen Promotion Team (KPT)

2.1.1 Basics of KPT

The QCC method is a Japanese-made institutional development tool by which employees continuously strive for improvement in their work. It enhances people's problem-solving skills as a leading management policy in all types of organization. QC Circles are small groups consisting of front-line employees who continually and collectively find a problem and discuss on alternative remedies to control and improve the quality of their work, products and services.

Fig 3. QCC

Packing section workers as members of QCC

QCC are formed by a small group between three and ten members who do the same or similar work, voluntarily meeting together regularly for about an hour per week in paid time, usually under the leadership of their own supervisor, and trained to identify, analyze, and solve some of the problems in their work, presenting solutions to management, and where possible, implementing the solutions themselves.

QCCs solve problems autonomously related to workplace such as problems of quality, cost, morale, safety etc. QCCs use several kaizen tools like QC 7 tools (Pareto diagram, Fishbone diagram etc), 5S, Brainstorming, Why-Why Approach, 5W1H etc. Activities of QC Circle are

to learn through QC Circle, to manage the work place (workplace rules, standards, 5s…) and solve problems at the work places.

2.1.2. The structure and role of the components of KPT

QCC/KPT structure is governed by unique conditions and eventually, integrated and the concept woven in the fabric of company's total operations as way of life.

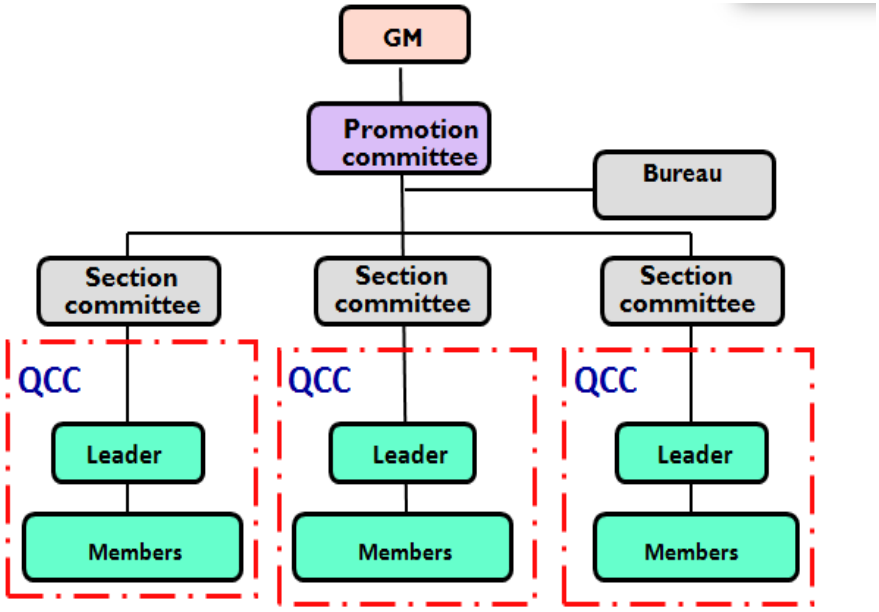


Fig 4 structure of KPT

Role of Promotion committees/Kaizen Core Team

- Set clear policy and goal for QCC/KPT program in the company.
- Establish operational guidelines & plans (master plan, plan on how to monitor, evaluate & recognize the exemplary performance of QCC leaders, members)
- Follow the condition of QCC.
- Give guidance, support, and cooperate actively.
- Coordination of QCC activities in the company.
- Formulate a budget for the program and identify sources of funds.
- Define qualifications and functions of facilitators (section committees).

- Evaluate the overall status of the QC Circle program, including training, rewards and recognition, promotional activities at least once a year using criteria and give advice as needed.
- Formulate corrective and preventive actions based on findings in the evaluation.

Role of Section committees/ facilitators

- Provide active support to the QCC & motivate QCC leaders & members.
- Organizes training courses & programs for new QCC.
- Organize QCC presentations.
- Coordinate and ensure availability of facilities to all QCC.
- Act as a counsellor to Promotion committee and QCC leaders.
- It implements the policies and plans formulated by the Promotion Committee.
- It handles all paperwork and maintains records like the QC Circle registry, minutes of meetings, and QC Circle cases.
- It organizes promotional activities like competitions and visits to other companies with QC Circles.
- Each department selects one to three facilitators, depending on the size of the company.
- In the beginning, one facilitator is usually assigned to three QC Circles.
- The QC Circle leaders call on the facilitator when they need support during meetings.

Role of Leader

- Conducting QC Circle meetings & direct activities of QC circle.
- Make clear the purpose of the QC circle's activities.
- Perform as a member in the QC circle activities.
- Maintain good atmosphere in which all members can express their opinions.
- Establish annual activity plan.
- Encouraging members
- Train next leader.
- Participating in industry-wide conventions.

- Studying about QC Circle activities and disseminating the knowledge.
- Seeking advise and support from the QCC Office on behalf of its members
- Manage QC circle activities with appropriately assigning roles to all the members.

Member's role

- Follow the workplace rule and discipline.
- Members listen to each other at all times.
- Participate and speak actively in QC Circle me
- Perform and be responsible to assigned activi
- Cooperate with other members.
- Arrive at meetings on time.

2.1.3 Establish Junior KPT

QC Circle Introduction Process

Fig 5. QC Circle Introduction Process

2.1.4. Implementation - Launch of a Pilot Circle

QCC program are tried on a small scale for prior experience. First-line supervisors start on a voluntary basis so as to encourage their subordinates too. The implementation stage consists of eight steps:

2.1.5. Sustaining QC Circle Activities

Implementation of a Company-wide QCC Program based on pilot experience, more Circles are organized depending on Steering Committee plans following the same training procedures.

Self-Check 2	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Define the word Kaizen? (3 points)
2. Write the origin of Kaizen? (6 points)
3. What are the three pillars of Kaizen? (3 points)
4. What are the Role of Section committees/ facilitators? (5 points)
5. What are the role of leader? (6 points)

Note: **Satisfactory rating - 20 points** **Unsatisfactory - below 20 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-3	Making effective and appropriate contributions to team activities and objectives.

3.1. Requisites of Kaizen

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

- ***K****nowledge 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.

- ***A****ttitude 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.

- ***I****nvolvement 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.

- ***Z****ealous support for Kaizen*: Kaizen needs zealous attention like support for one football team.

- ***E****ducation about Kaizen (training):* Kaizen is human-oriented i.e. it is implemented by employees therefore education or training about Kaizen is vital.

- ***N****ever-ending activity:* Kaizen is continuous and practical, aiming always for best improvement through accumulation of small improvements.

3.1. Kaizen Systems

Underlying the Kaizen strategy is the recognition that management must seek to satisfy the customer and serve customer needs if it is to stay in business and make a profit. This Kaizen strategy has systems that can be applied to realize planned goals and targets. These systems include:

3.2. Kaizen Tools

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.

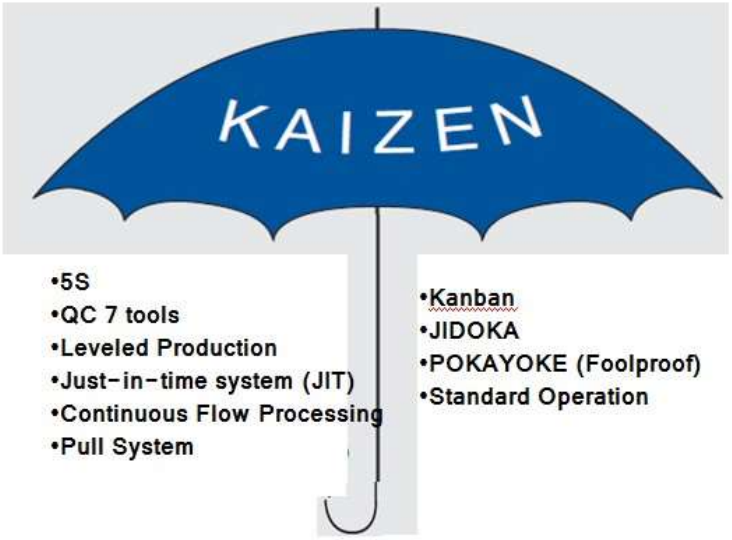


Fig. Some basic Kaizen techniques.

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.

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.

Leveled production means levelling of type and/or volume of items produced at anytime. It is avoiding variance in product types and/or volume.

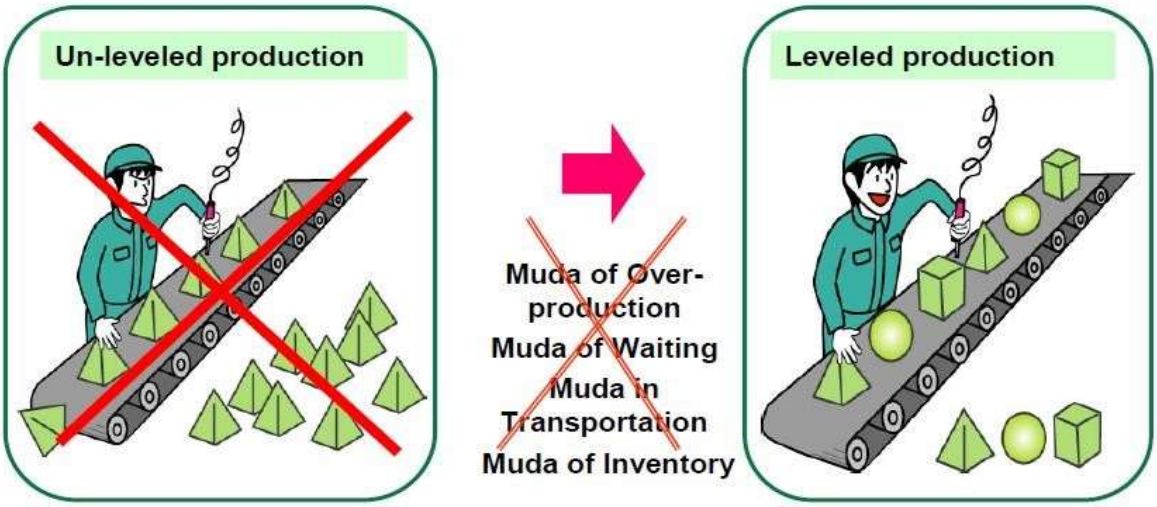
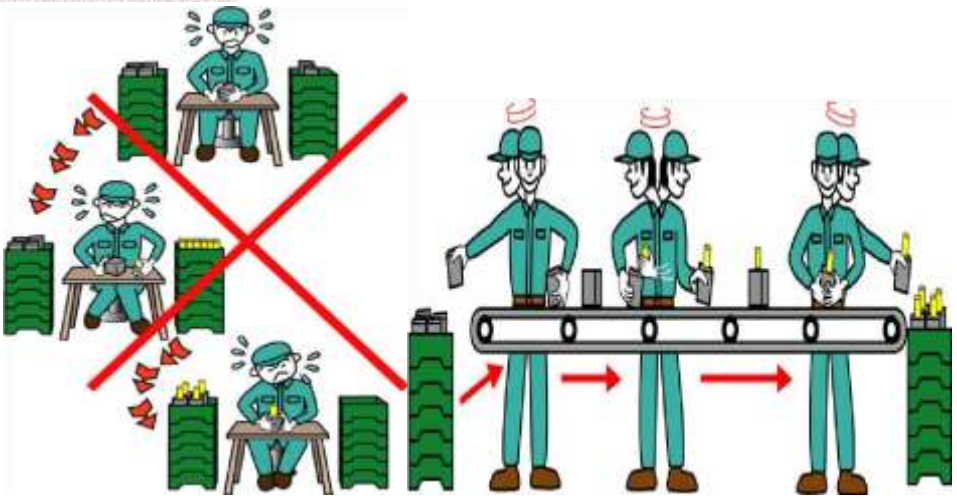


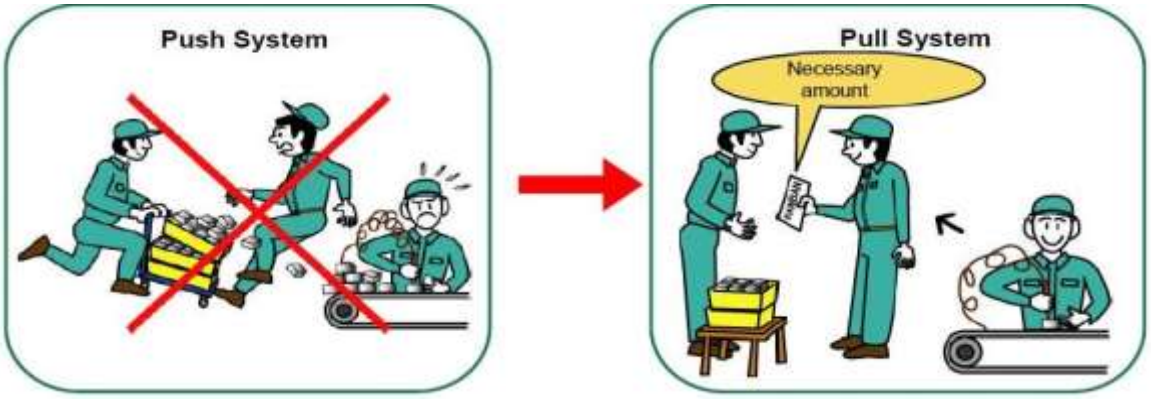
Fig. comparison of UN leveled and leveled production

Just-in-time is a method of production in which a production line produces just what is needed, only when needed, and in exact quantity needed.

Continuous flow processing s a method of production in which products move from one work station to the next piece by piece in succession and in Correct sequence of processing to complete a process.

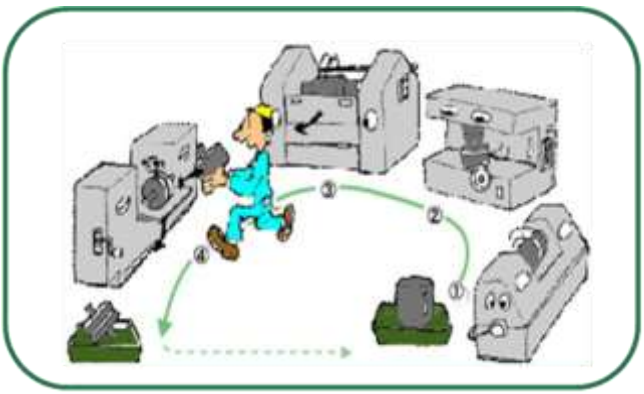


Pull System is when products in the previous process are taken by the workers in the next process when needed and in the amount needed. In the previous process operation, only the amount taken is produced. *Kanban* is used as the communication tool to request parts, semi-products or materials from the upstream process (previous process) in exact quantity & specifications needed.



JIDOKA is a systematic approach to prevent defects or abnormalities from passing to the next process. Operation stops automatically by a **programmed machine** at the time of detection of an abnormality or stopped **by the worker** who detected the abnormality.

Standard operation is an efficient production method/procedure that can be followed by anyone assigned for a task. It helps to clarify the rules for the production method and find out what is wasteful, uneven, and overburdening.



"All I need to do is to follow the same cycle!"

3.3 Kaizen targets or elements

PQCDSMEG are targets of Kaizen activities. PQCDSMEG stands for Productivity, Quality, Cost, Delivery time, Safety, Moral, Environment, and Gender equality (added by EKI). If this eight targets can be achieved then success of the organization and customer satisfaction are confirmed.QCD refers to the three elements of satisfying customer requirements: Quality, Cost and Delivery.

Productivity: is expressed as the ratio of output to input. A general productivity measure often used in production control is the quantity or value of products produced per unit time. Another commonly used productivity measure is labour productivity, i.e., the quantity or value of products produced per worker per hour.

Quality: means degree of fulfillment of requirements. In a market economy or where competition is prevalent, these requirements are ultimately what the customers' demand of products or services they want to purchase. In most cases, companies providing the products or services determine the requirements based on their best attempt to meet the customer needs. In other words, quality refers to conformance to specifications and customer requirements. For instance, Product quality requirements relate to the product's shape, appearance, performance, reliability, durability, and so forth. These product requirements are ultimately what the customers want.

In a broader sense, quality refers to the quality of process or work in designing, producing, delivering, and after-servicing the products or services. The foremost concern is with the *quality of people.* The three building blocks of a business are hardware, software, and "human ware." Only after human ware is squarely in place should the hardware and software aspects of a business be considered. Building quality into people means helping them become Kaizen conscious.

Cost: is monetary value of all the inputs to produce a product. In accounting terms, cost includes cost of labour, cost of materials, and other expenses. The cost items that can be directly attributable to a product manufacturing process is called direct expense, while others are called indirect expense. Total manufacturing cost, or product cost, is the sum of the two. Unit manufacturing cost (unit product cost) is used in the factory level or workplace level cost management, therefore, used often times in KAIZEN activities as well. Cost is one of the three primary targets of improvement in KAIZEN activities along with quality and deliver.

Manufacturing/Service cost = (material + labor + facility + utility + others)cost

The word cost usually refers to cost management, and not cost cutting. Cost management refers to managing various resources properly, and eliminating all sorts of wastes/Muda in such a way that the overall cost goes down.

Delivery time: refers to the timely delivery of the volume of products or services to meet the customer's needs. On-time product delivery to the customer or adhering to the due date is critical to achieve customer satisfaction together with quality and cost in a competitive market environment.

Moral / Motivation: Morale generally refers to people's confidence, enthusiasm and discipline as a person or as a group. Morale at workplace is therefore employees' confidence, enthusiasm and discipline in terms of the work and goals of the workplace. People have the desire to demonstrate their capability fully, to be recognized, to grow, and to become fulfilled. KAIZEN activities at the workplace

with genuine participation of employees provide such opportunities to the employees, and as the result, boost their morale. This is to create a virtuous cycle of KAIZEN's advancement and the employees' growth as individual persons progressing in tandem. In order to achieve such a virtuous cycle, company management should develop and maintain a management principle of trust and empowerment for employees, in which employee participation and their initiatives at the workplace are fully supported; delegation of authority to managers/supervisors is properly done; and training opportunities are provided to employees. And motivation is people's willingness to work on tasks, activities and any other engagements they undertake.

Safety: Kaizen is also used as a methodology for making safety improvements. Safety is the condition of a “steady state” of an organization or place doing what it is supposed to do. In the world of everyday affairs, not all goes as planned. Some entity’s steady state is challenged. This is where security science, which is of more recent date, enters. Drawing from the definition of safety, then: Security is the process or means, physical or human, of delaying, preventing, and otherwise protecting against external or internal, defects, dangers, loss, criminals, and other actions that threaten, hinder or destroy an organization’s “steady state,” and deprive it of its intended purpose for being. For instance, home safety may indicate a building's ability to protect against external harm events (such as weather, home invasion, etc.), or may indicate that its internal installations (such as appliances, stairs, etc.) are safe (not dangerous or harmful) for its inhabitants.

Ensuring that a workplace is safe and lively to the satisfaction of the employees working there, and it is also indispensable as corporate activities. In particular, safety is directly related to each worker. The employees are expected to have a strong stance of creating a workplace which is safe and full of vitality. Each year thousands of employees are killed or seriously injured at work. The vast majority of these deaths could be prevented, and the severity of the injuries could be greatly reduced. There are nine key sets of actions that you can take to improve safety in your company.

- Mark emergency exits and put up warning signs
- Provide protective clothing and tools
- Raise safety awareness
- Establish safety standards and regulations
- Set up safety committees and patrols
- Ensure facilities and equipment are safe
- Keep accident records
- Set safety targets
- Be prepared to deal with disasters

A safe workplace is a place with decreased in negligent errors, decreased or zero accidents, reduction of fatigue, comfortable environment, proper arrangement, clean etc.

Environment: The environment has many resources essential for life. These resources must be used wisely for generations to continue. Such resources include air, water, light, land/space etc. which should be utilized efficiently. Wastes that occur on the environment should be reduced by recycling as much as possible. Applying Kaizen also helps to make efficient use of the environment and to conserve it. Hence, environment should be one of the targets of Kaizen..

Gender equality: Gender can refer to the unconsciously constructed roles of men and women, as well as their mutual relationships, based on such factors as culture, tradition, and customs. Deep-rooted gender inequality, especially in developing nations, frequently places women in a disadvantaged position with regard to education, healthcare, labor, and other aspects of society. The promotion of gender equality and empowerment of women is a priority of the Millennium Development Goals and will remain an important part of the development agenda. Kaizen can convey this gender equality by changing the attitude of people. Hence bringing gender equality should be one of the targets of Kaizen. Gender should be considered in conducting any activities.

Self-Check 3	Written Test

Instructions: **Read the following questions and write your answers in the answer sheet provided:**

1. What are Kaizen requisites? (3 points)
2. What are Kaizen targets or elements**?** (3 points)
3. Describe Standard operation? (6 points)

Note: **Satisfactory rating - 12 points** **Unsatisfactory - below 12 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-4	**Use effective and appropriate forms of communications.**

4.1. Method of communication in a team

Teamwork can provide a real opportunity for people to work together to achieve improvement. People who work on their own are often unfamiliar with the work that is done even by people who work quite near to them: as a result they are unaware of the consequences of poor quality in the work they themselves do. Bringing people together in teams, with a common goal of improvement, aids communication between departmental or functional activities. Teamwork slowly breaks down the communication barriers and acts as a platform for change. Communication is part of the cement that holds together the bricks of Kaizen processes supporting the principle of people-based management.

To communicate properly, it is necessary to focus on the receiver of the message. Communication is very much a two-way process. For successful communication, you need to build credibility into the message and in the person giving the message. Anything that detracts from this does damage to both. Teamwork also enables a group of people to work as a task force, looking at cross-functional problems, or as an action team, solving local problems, in order to identify and adopt new ways of doing things.

Effective communication: is an essential facet of people management. For business success, regular, two-way communication, particularly face to face with employees and team members, is an important factor in establishing trust and a feeling of being valued. Two-way communication is regarded as both a core management competency and as a key management responsibility. For example, a typical list of management responsibilities for effective communication is to:

- Regularly meet all the members.
- Ensure people are briefed on key issues in a language free of technical jargon.

- Communicate honestly and as fully as possible on all issues which affect the employees.
- Encourage team members/employees to discuss company issues and give upward feedback.
- Ensure issues from team members/employees are fed back to senior managers and timely replies given.

Brainstorming: Brainstorming is a method of getting a group of people to generate a lot of ideas in a short space of time without assessing their value. Group thinking usually produces more ideas than individual thinking. It is used in teams, when trying to identify possible root causes or when seeking solution to a problem. Brainstorming can also be used when deciding what problem or improvement activity to work on, and when planning the steps of a project.

Brainstorming is a technique that was developed in 1930 by Alex Osborne as a way of encouraging groups to be more creative with their ideas. It is important to recognize that there are barriers to creative thinking. One is the tendency to assume that the way things have always been done is the only way they can be done. We often hear people say, “Yes, but we’ve always done it this way!” Another barrier is the fear of looking foolish. This fear limits our range of contribution—to things that are safe and conventional—and leads to our giving the expected answer. A third barrier is the tendency to make hasty judgment on what is said, without careful consideration. How many ideas get thrown in the waste bin without anyone really thinking about them and trying them, merely because they initially seem impractical, impossible, or crazy? A fourth barrier is the commonly held view that there is always one right solution to every problem. This leads people to look for the obvious and logical answer rather than the less obvious, creative solution.

Brainstorming seems very simple. It works best when the team meeting is informal. To help this there are eight basic rules:

1. Keep the meeting relaxed.
2. Select a leader to write the ideas on a flip chart.
3. Involve the right people in the team.

4. Define the problem clearly. You will need to check that everyone present has the same understanding of the problem. This can be difficult to achieve in practice. A useful first stage of any brainstorm could involve a brief discussion of the problem before a definition is agreed.
5. Generate as many ideas as possible without discussion or evaluation. The more creative ideas the better. There are two main ways of doing this. The first is simply to invite people to contribute and write the ideas down as they are suggested. This is called the 'free wheeling' method. The second is to go round the room asking each person in turn for his or her contribution. This is called the 'round robin' method.
6. Encourage everyone to contribute. This is best done by beginning the session with a trivial example, such as 'uses of a paper cup', to get everyone started before moving on to the question in hand.
7. Write down every idea. There should be no censorship and there is no such thing as a bad idea. Sometimes strange ideas open up a new area of thought. Build on other people's ideas.
8. Following the brainstorm, a technique such as list reduction method should be used to reduce the brainstormed list to manageable proportions.
9. Don't criticize other people's ideas.
10. Every member should speak freely, there are no dumb ideas.

Benefits of brainstorming: by encouraging everyone to contribute, brainstorming breaks down barriers between departments and levels of hierarchy. It therefore allows everyone to contribute equally to the team. Brainstorming encourages cooperative and collaborative behavior and is also useful in the development of group work skills. Remember that brainstorming involves collecting people's ideas and opinions and that it might be necessary to collect data following the brainstorm to allow any decisions to be taken on the basis of fact.

Self-Check 4	**Written Test**

Instructions: **Read the following questions and write your answers in the answer sheet provided:**

4. What is Effective communication? (3 points)
5. What is a Brainstorming**?** (3 points)
6. Describe the Benefits of brainstorming? (6 points)

Note: **Satisfactory rating - 12 points** **Unsatisfactory - below 12 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-5	**Prepare and use Kaizen Board (Visual Management Board).**

5.1. Concept and parts of Kaizen board

Kaizen board is a bulletin board set up at a workplace or in a publicly accessible place in the factory or the company in order to disseminate information about the Kaizen activities at the workplace and the company. Information put up on the board includes various Kaizen-related news and announcements, either company-wide one or particular workplace related. A summary of QC Circle activity result can be posted. It is a means of management -employee communication. Information sharing in this manner helps foster employees' sense of participation, recognition and motivation in Kaizen activities.

Every working team or KPT has to prepare and use a Kaizen board. This encourages for the teams to work “as independent as possible” and transform their ideas to improvements. As long as every team uses a Kaizen board, it becomes also easy for the management to be informed at any time, just by walking around and checking the information on the board. In general a Kaizen board is important for:

- Continuous Kaizen activity in a company or organization.
- Participation of all employees during Kaizen activity through Suggestion system.

- Employees including management to know about Kaizen performance in their work area or organization.
- Employees and management to know about production plans and performance.

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.

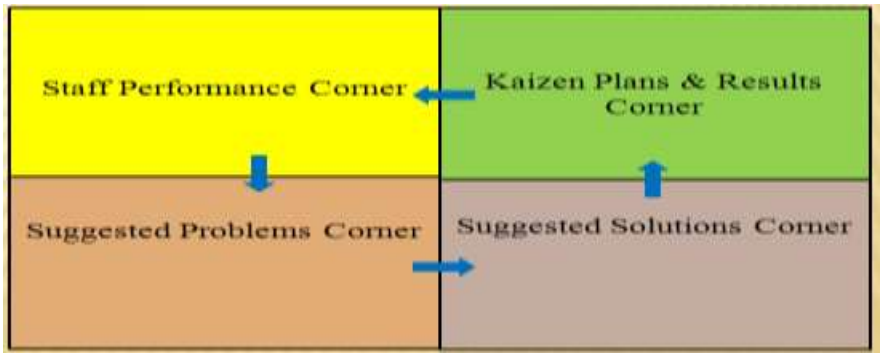


Fig Kaizen board

- The “staff performance corner” shows the actual performance of the staff and the gabs 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”.
- The “suggested solutions corner” displays the solutions suggested for known problems. And the solution ideas have to be implemented and the results achieved have to be shown on the “Kaizen results corner”.

Self-Check 5	Written Test

Instructions: **Read the following questions and write your answers in the answer sheet provided:**

1. What is Kaizen board? (3 points)
2. Describe benefits of a Kaizen board? (3 points)
3. Describe the size of kaizen board? (6 points)

Note: **Satisfactory rating - 12 points** **Unsatisfactory - below 12 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Operation Sheet 1	**Prepare and use Kaizen Board**

Objectives: To Prepare and use Kaizen Board:

Procedures

Step 1- wear PPE.

Step 2- select required tools and materials

Steps 3- select your material based on their size

Steps 4- measure 1m by 1m from local available material

Step 5- cut out and tight with nail on the wall

Step 7- use for different notice materials

LAP Test	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

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

Task 1: prepare a kaizen board activity in your workshop.

Task 2: Following the steps for using 5S Map, draw before and after map/ layout of your work shop.

Task 3: Following the procedures of making kaizen board in the assigned workshop.

List of Reference Materials

1. 5S Training of Trainers for Training Institutions
2. Journals/publications/magazine
3. 5S / Visual Workplace Handbook of Brady

HORTICULTURAL CROPS PRODUCTION

LEVEL I

Learning Guide -08

Unit of Competence: - Apply 3S

Module Title: Applying 3S

LG Code: AGR HCP1 M03 LO2-LG08

TTLM Code: AGR HCP1TTLM031219v1

LO2. Prepare for work.

Instruction Sheet	Learning Guide #08

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

- Using work instructions.
- Reading and interpreting Job specifications.
- Observing OHS requirements.
- Selecting materials.
- Identifying and checking safety equipment and tools.

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.
- Read and interpret Job specifications.
- Observe OHS requirements.
- Select materials.
- Identify and check safety equipment and tools.

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 3 to 20.
3. Read the information written in the “Information Sheets 1”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
4. Accomplish the “Self-check 1,2,3,4 and 5” **in page -.** 39,42,46,,49 and 51
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-check 1).

6. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.
7. Submit your accomplished Self-check. This will form part of your training portfolio

Information Sheet-1	Using work instructions

1.1. 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.

The requirements for a job vary according to the nature of the job itself. However, a certain work ethic must be cultivated to succeed in any job and this is fundamental to an individual’s sense of himself as a worker, as part of production relations and a fundamental economic being. 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. Any job requires a fundamental core of discipline from the worker or the employee and this is a quality which is independent of age, post, stature, job and so on. Discipline is absolutely indispensable and provides the impetus for work that can be strenuous, repetitive, boring and even unsatisfactory at times.

Enthusiasm: Enthusiasm for work is also a pre-requisite for any job. An innate love for the job, which in modern parlance is known as job satisfaction, is a core requirement for any job. The drive to succeed, to innovate, to do well and to make one's profession into one's livelihood is a critical drive which needs to be present in the employee or cultivated as soon as possible. No job, however perfectly carried out, can evoke the feeling of satisfaction of a job well done without the instinct for success.

Qualifications: This is a more material, tactile need for a job which can be conveyed through degrees and certificates. However education is not limited to what is taught in colleges or vocational training courses. It is the burning desire to learn more, to reach the depths of knowledge about a particular field of interest, to complete the job and learn from it that marks the true enthusiast and the truly learned.

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. For example, good and smooth communication, computer skills, proficiency in language if needed, presentable appearance, the ability to manage crises are all soft skills which are fundamentally important in any job and which must be cultivated consciously.

Thus, the requirements of a job, though specific to it, cover also a general spectrum. These make for better employees and better individuals.

1.2. 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.

1.3. 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)?

Self-Check 1	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Explain the difference between procedure and work instruction? (5 points)
2. Define job specification? (5 points)
3. List the requirements of job. (5 points)

Note: **Satisfactory rating - 15 points** **Unsatisfactory - below 15 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-2	Reading and interpreting Job specifications

2.1. 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. Job Analysis is a primary tool to collect job-related data. The process results in collecting and recording two data sets including job description and job specification. Any job vacancy cannot be filled until and unless HR manager has these two sets of data. It is necessary to define them accurately in order to fit the right person at the right place and at the right time. This helps both employer and employee understand what exactly needs to be delivered and how.

2.2. Job Description

Job description includes basic job-related data that is useful to advertise a specific job and attract a pool of talent. It includes information such as job title, job location, reporting to and of employees, job summary, nature and objectives of a job, tasks and duties to be performed, working conditions, machines, tools and equipment's to be used by a prospective worker and hazards involved in it.

Purpose of Job Description

The main purpose of job description is to collect job-related data in order to advertise for a particular job. It helps in attracting, targeting, recruiting and selecting the right candidate for the right job.

It is done to determine what needs to be delivered in a particular job. It clarifies what employees are supposed to do if selected for that particular job opening.

It gives recruiting staff a clear view what kind of candidate is required by a particular department or division to perform a specific task or job.

It also clarifies who will report to whom.

Job Specification

Also known as employee specifications, a job specification is a written statement of educational qualifications, specific qualities, level of experience, physical, emotional, technical and communication skills required to perform a job, responsibilities involved in a job and other unusual sensory demands. It also includes general health, mental health, intelligence, aptitude, memory, judgment, leadership skills, emotional ability, adaptability, flexibility, values and ethics, manners and creativity, etc.

Purpose of Job Specification

Described on the basis of job description, job specification helps candidates analyze whether are eligible to apply for a particular job vacancy or not.

It helps recruiting team of an organization understand what level of qualifications, qualities and set of characteristics should be present in a candidate to make him or her eligible for the job opening.

Job Specification gives detailed information about any job including job responsibilities, desired technical and physical skills, conversational ability and much more.

It helps in selecting the most appropriate candidate for a particular job.

Job description and job specification are two integral parts of job analysis. They define a job fully and guide both employer and employee on how to go about the whole process of recruitment and selection. Both data sets are extremely relevant for creating a right fit between job and talent, evaluate performance and analyze training needs and measuring the worth of a particular job.

Self-Check 2	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Explain Job Specification? (5 points)
2. Define job Description? (5 points)
3. List the Purpose of Job Specification (5 points)

Note: **Satisfactory rating - 15 points** **Unsatisfactory - below 15 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-3	Observing OHS requirements.

3.1. 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 include 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.

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. The goals of occupational safety and health programs include fostering a safe and healthy work environment. OSH may also protect co-workers, family members, employers, customers, and many others who might be affected by the workplace environment. In the United States the term occupational health and safety is referred to as occupational health and occupational and non-occupational safety and includes safety for activities outside work.

Occupational safety and health can be important for moral, legal, and financial reasons. In common-law jurisdictions, employers have a common law duty (reflecting an underlying moral obligation) to take reasonable care for the safety of their employees. Statute law may build upon this to impose additional general duties, introduce specific duties and create government bodies with powers to regulate workplace safety issues: details of this will vary

from jurisdiction to jurisdiction. Good OSH practices can also reduce employee injury and illness related costs, including medical care, sick leave and disability benefit costs.

As defined by the World Health Organization (WHO) "occupational health deals with all aspects of health and safety in the workplace and has a strong focus on primary prevention of hazards." 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. It contrasts, 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.

Since 1950, the International Labour Organization (ILO) and the World Health Organization (WHO) have shared a common definition of occupational health. It was adopted by the Joint ILO/WHO Committee on Occupational Health at its first session in 1950 and revised at its twelfth session in 1995. The definition reads: "The main focus in occupational health is on three different objectives: (i) the maintenance and promotion of workers' health and working capacity; (ii) the improvement of working environment and work to become conducive to safety and health and (iii) development of work organizations and working cultures in a direction which supports health and safety at work and in doing so also promotes a positive social climate and smooth operation and may enhance productivity of the undertakings. The concept of working culture is intended in this context to mean a reflection of the essential value systems adopted by the undertaking concerned. Such a culture is reflected in practice in the managerial systems, personnel policy, principles for participation, training policies and quality management of the undertaking."

3.2. Workplace hazards

Although work provides many economic and other benefits, a wide array of workplace hazards also present risks to the health and safety of people at work. These include "chemicals, biological agents, physical factors, adverse ergonomic conditions, allergens, a complex network of safety risks," and a broad range of psychosocial risk factors.

Physical and mechanical hazards

At-risk workers without appropriate safety equipment

Physical hazards are a common source of injuries in many industries. They are perhaps unavoidable in certain industries, such as construction and mining, but over time people have developed safety methods and procedures to manage the risks of physical danger in the workplace. Employment of children may pose special problems. Falls are a common cause of occupational injuries and fatalities, especially in construction, extraction, transportation, healthcare, and building cleaning and maintenance.

An engineering workshop specializing in the fabrication and welding of components has to follow the Personal Protective Equipment (PPE) at work regulations 1992. It is an employer's/workers duty to provide 'all equipment (including clothing affording protection against the weather) which is intended to be worn or held by a person at work which protects him against one or more risks to his health and safety'. In a fabrication and welding workshop an employer would be required to provide face and eye protection, safety footwear, overalls and other necessary PPE.

Machines are common place in many industries, including manufacturing, mining, construction and agriculture, and can be dangerous to workers. Many machines involve moving parts, sharp edges, hot surfaces and other hazards with the potential to crush, burn, cut, shear, stab or otherwise strike or wound workers if used unsafely. Various

safety measures exist to minimize these hazards, including lockout-tag out procedures for machine maintenance and roll over protection systems for vehicles.

Self-Check 3	**Written Test**

***Instructions**:* Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers. Write your answers in the sheet provided in the next page.

1. What is OHS represents for (2 point)
2. What is OSH represents for? (1 point)
3. What are the goals of OHS? (2 points)
4. List some examples of OHS requirements in your work areas. (10 points)
5. List at least four workplace hazards? (4 points)

Note: **Satisfactory rating - 20 points** **Unsatisfactory – below 20 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-4	Selecting materials.

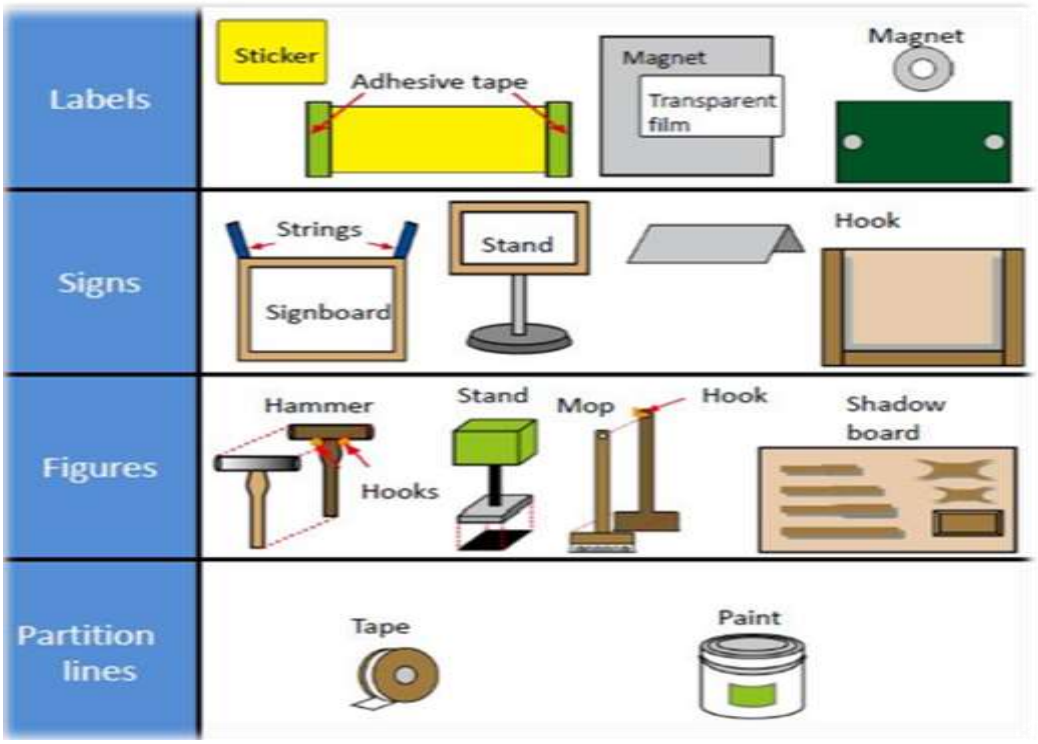
Tools and materials used to implement Sort activity

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…)

Tools and materials used to implement set in order

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



Tools and materials used to implement shine

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

- Sponge
- Broom
- Brush
- vacuum cleaner
- garbage containers
- screws etc…
- oil
- detergent s
- spade
- bolts
- floor scrubber cleaning Pads



Self-Check 4	Written Test

Instructions: Perform the following tasks. Write your answers in the answer sheet provided:

1. List at least five me tools and materials used to implement Sort. (5 points)

2. List at least six tools and materials used to implement Set in order. (6 points)

3. List at least seven tools and materials used to implement Shine. (7 points)

Note: **Satisfactory rating - 10 points** **Unsatisfactory - below 10 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-5	**Identifying and checking safety equipment and tools.**

5.1. Identifying, using, maintaining and storing PPE

Your employees may need personal protective equipment to evacuate during an emergency. Personal protective equipment must be based on the potential hazards in the workplace. Assess your workplace to determine potential hazards and the appropriate controls and protective equipment for those hazards. PPE may include items such as the following:

- Safety glasses, goggles, or face shields for eye protection;
- Hard hats and safety shoes for head and foot protection;
- Proper respirators;
- Chemical suits, gloves, hoods, and boots for body protection from chemicals;
- Special body protection for abnormal environmental conditions such as extreme temperatures; and

- Any other special equipment or warning devices necessary for hazards unique to your worksite

5.2. Undertaking basic safety checks on all machinery and equipment before operation

Pre-operational and post-startup checks

Those checks and inspections that are carried out on the excavator with grab prior to commencing any production tasks. Pre-operational checks should be performed in accordance the manufacturer's specifications (generally found in the operator's manual) and any relevant enterprise procedures. Ideally these checks are performed against a checklist which may also form part of the enterprise's quality and/or safety system

Self-Check -5	**Written Test**

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Write down safety equipment's? (6points)
2. What are Pre-operational and post-startup checks? (6points)

Note: **Satisfactory rating - 12points** **Unsatisfactory - below 12points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Operation Sheet 2	Tools and materials used to implement 3s activity

Objectives: To Prepare Tools and materials used to implement 3s activity

Procedures

Step 1- wear PPE.

Step 2- select required tools and materials

Steps 3- select your material based on their size

Steps 4- put the material based on their group

Step 5- keep material safety

LAP Test 1	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

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

Task 1: prepare materials to implement 3s activity in your workshop.

Task 2: Following the steps for using 3S Map, draw before and after map/ layout of your work shop.

Task 3: Following the procedures of to implement 3s activity in the assigned workshop.

List of Reference Materials

1. 5S for operators (1995)
2. Ethiopia Kaizen Manual (2011)

Journals/publications/magazine

HORTICULTURAL CROPS PRODUCTION

LEVEL I

Learning Guide 09

Unit of Competence: Apply 3S

Module Title: Applying 3S

LG Code: AGR HCP1 M03 LO3-LG09

TTLM Code: AGR HCP1TTLM031219v1

LO3. Sort items

Instruction Sheet	Learning Guide #09

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

- Preparing Plan.
- Performing cleaning.
- Identifying all Items and following appropriate procedures.
- Listing necessary and unnecessary items using the appropriate format.
- Using Red tag strategy.
- Evaluating and placing unnecessary items.
- Recording and quantifying Necessary items.
- Reporting performance results.
- Checking necessary items.

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 Plan.
- Perform cleaning.
- Identifying all Items and following appropriate procedures.
- List necessary and unnecessary items using the appropriate format.
- Use Red tag strategy.
- Evaluate and place unnecessary items.
- Record and quantify Necessary items.
- Report performance results.
- Check necessary items.

Learning Instructions:

1. Read the specific objectives of this Learning Guide.

2. Follow the instructions described in number 3 to 20.
3. Read the information written in the “Information Sheets 1”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
4. Accomplish the “Self-check 1, 2,3,4,5,6,7,8 and 9” **in page -.** 63,66,68,70,72,74,77,80 and 82
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 “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.
7. Do the lab test on page 82

Information Sheet-1	**Preparing Plan**

1.1. Stages of implementation

Definition of Sort

- Sort means that you remove all items from the workplace that are not needed for current production or transactional operations
- It does not mean that you only remove the items that you know you may never need
- It does not mean that you simply arrange things in a neater fashion

Stages of 5S implementation

- Implementing Sustain
- Keep everyone aware of 5S and its benefits
- Make time each day to perform daily tasks
- Make it structured
- Give recognition where it is due

The three stages implementing 5S are:

- Planning
- Implementation
- Sustaining

1.2 Planning for sorting

Steps for planning include:

1. Form Kaizen Team organizational structure
2. Recognize current condition
3. Deciding activity range
4. Goal setting
5. Planning stage
6. Budgeting
7. Kick-off

The management body or Kaizen core team with a structure similar to this diagram provides guidance and direction on 5S and company-wide Kaizen activities. Prepare over all 5S or all Kaizen implementation plan, follow up 5S or Kaizen activities, perform any other 5S or Kaizen related activities, organize training etc**.**

Duties of facilitators is to follow up the activities of KPT's activities, collect information about the KPTs and report to the core team, document plans, reports and results, consult KPTs, distributes all Kaizen formats to the KPTs, assist KPTs' activities related to kaizen, etc.

1.3 Recognition of current condition

Purpose Recognize the current condition of workplace and collect information required to identify problems, and set the direction of activity and goals.

Method: 5S Checklist

Photography Procedure kaizen promotion office gives instructions

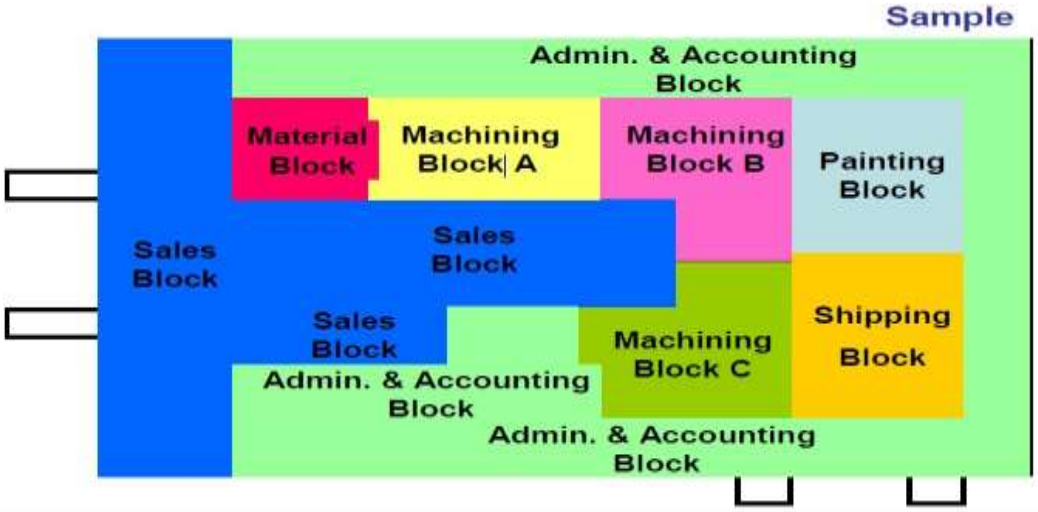
Photography

(1) Fixed-point Observation Type

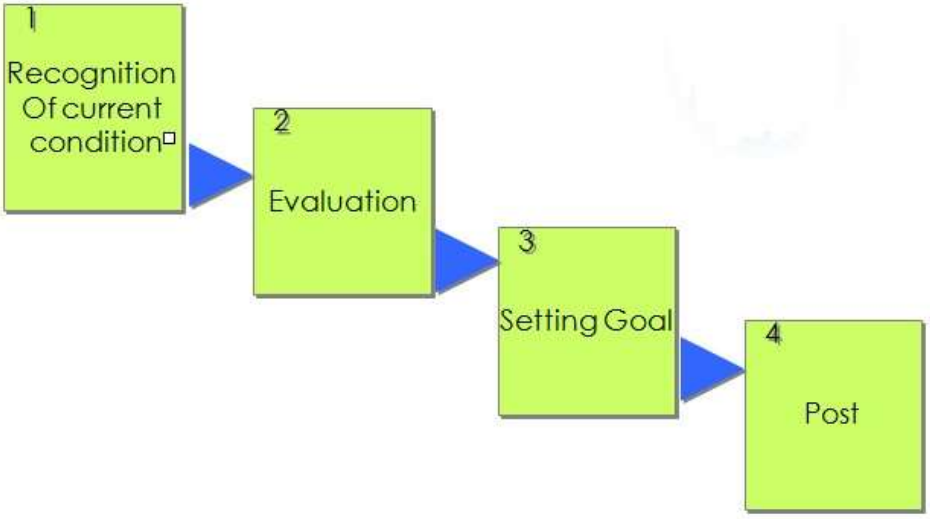
(2) Random Type

3. Decide Activity range

4.Decide 5S promotion blocks



1.4 Goal setting



2) Setup of activity time

The following table shows example of activity time plan for the 3rd component of 5S i.e. shine.

Type of cleaning	Time	Frequency (timing)
Daily cleaning	5 – 10 min.	Minor operation before/after working hour at each shop
Weekly cleaning	15 – 30 min.	Weekend
Monthly cleaning	30 – 60 min.	End of month

Big cleaning days	2 – 4 hrs.	Before national holidays
Location which is not easy to clean	1 – 2 days	In case of necessity for assistance request to other division

3) Training plan

A training plan is prepared to conduct training on 5S and other Kaizen techniques.


1.6. Budgeting

It is necessary to prepare a budget for 5S activity because it costs money although it needs small. Budget to buy signboards, labels, paint, etc.

1.7. Implementation

There are procedures for implementation of each of the pillars of 5S that will be explained in the following contents. Four factors are important for successful 5S implementation. These are:

- Continued commitment and support by top management.
- 5S starts with education and training.

- There are no observers in 5S, everyone participates.
- Repeat the 5S cycle in order to achieve a higher standard.

1.8. 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.

Self-Check -1	**Written Test**

***Instructions**:* Answer all the questions listed below. Write your answers in the sheet provided in the next page.

1. What are the three stages of 5S implementation? (3 points) ____
2. What are the steps for 3S planning? (7 points) ____
3. Name two methods to recognize or collect data about the current condition of a work place. (2 points) ____

Note: **Satisfactory rating - 12 points** **Unsatisfactory - below 12 points** You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score_____

Name: _____ Date: _____

Information Sheet-2	**Performing cleaning**

2.1 Definition of Cleaning

Cleaning is so important because when we clean an area, we are also doing some inspection or checking of machinery, equipment, and work conditions. An operator cleaning a machine can find many mal-functions. When a machine is covered with oil, soot, and dust, it is difficult to identify any problems that may be developing. While cleaning the machine, however, one can easily spot oil leakage, a crack developing on the cover, or loose nuts and bolts. Once these problems are recognized, they are easily fixed.

It is said that most machines breakdowns begin with vibration (due to loose nuts and bolts), with introduction of foreign particles such as dust (due to the crack on the cover, for instance), or with inadequate oiling and greasing. For this reason shine is useful to make discoveries while cleaning machines. Hence, shine means cleaning the workplace's floors, equipment and facilities, provide inspection at the same time, and ensure that they are in good operating condition.

2.2. Benefits of cleaning

One of the more obvious purposes of shine is to turn the workplace in to clean, bright place where everyone will enjoy working. Another key purpose is to keep everything in top condition so that when someone needs to use something, it is ready to be used. Companies or organizations should avoid the tradition of annual at the end of the year or on spring cleanings. Instead, cleaning should become a deeply ingrained part of daily work habits, so that tools, equipment, and work areas will be ready for use all the time.

Fig. Workers cleaning machines

Cleanliness for factories and offices is a lot like bathing for human beings. It relieves stress and strain, removes sweat and dirt, and prepares the body and mind for the next day. Cleanliness is important for physical and mental health. Just as you would not bath only once a year, performing shine procedures in a factory should not be an annual activity. Cleaning should be done on daily basis.

Fig. Shine activities relieves stress and strain

Shine activities can play an important part in bringing work efficiency and safety. Cleanliness is also linked with the morale of employees and their awareness of improvements. Factories or workshops that do not implement the shine pillar suffer the following types of problems:

1. Poor morale and inefficiency at work. This could be due to dirty windows that can pass only little light.
2. Unable to see or find defects in dark and messy workplaces.
3. Slipping and injuries can be created due to puddles of oil and water on the floor.
4. Frequent breakdown of machines due to insufficient check-ups and maintenances which in turn leads to late deliveries.
5. Low and unsafe operating machines due to insufficient checkups and maintenance which in turn leads to hazard and accidents.
6. Defects will result due to shaving cuts getting mixed in to production or assembly processes.
7. Shaving cuts can get in to people's eyes and create injuries.
8. Low morale due to filthy work environments.

Self-Check 2	Written Test

***Instructions**:* Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers. Write your answers in the sheet provided in the next page.

1. What are the benefits of implementing cleaning activity? (4 points)
2. Define cleaning? (6 points)

Note: **Satisfactory rating – 10 points** **Unsatisfactory - below 10 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

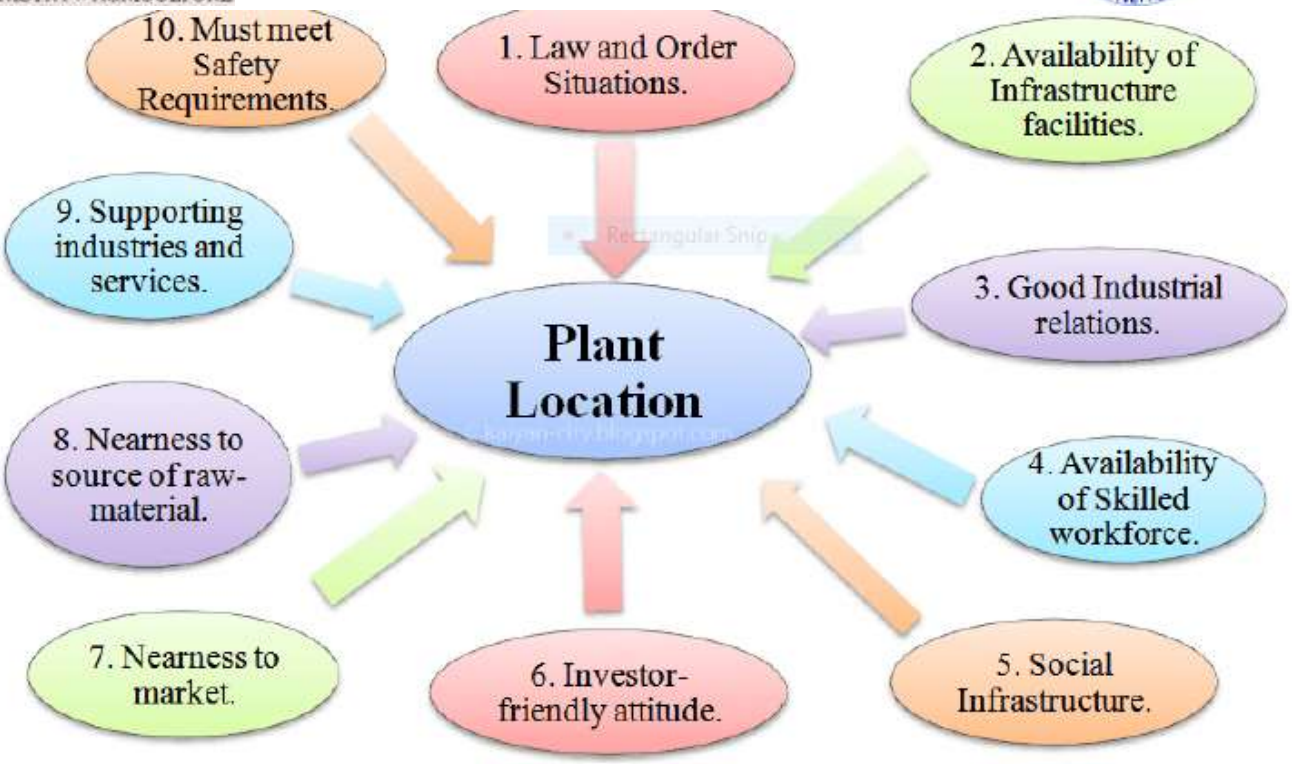
Information Sheet-3	Identifying all Items and following appropriate procedures

3.1 The following image depicts important factors affecting a plant location.

The ten main factors that affect a plant location are as follows:

1. Law and order situation,
2. Availability of infrastructure facilities,
3. Good industrial relations,
4. Availability of skilled workforce,
5. Social infrastructure,
6. Investor friendly attitude,
7. Nearness to market,
8. Nearness to raw-materials' source,
9. Nearness to supportive industries and services, and
10. Must meet safety requirements.

Now let's discuss above factors affecting the location of a plant.



Factors affecting plant location

Self-Check 3	Written Test

Instructions*:* Answer all the questions listed below. Write your answers in the sheet provided in the next page.

1, write factor affected location of industry or farm/ enterprise? (10 points)

Note: **Satisfactory rating - 3 points** **Unsatisfactory - below 3points**

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

Answer Sheet

Score_____

Name: _____ Date: _____

Information Sheet-4	Listing necessary and unnecessary items using the appropriate format

4.1. Necessary items and *unnecessary items*

Necessary items are items which are used to in working area, where as *unnecessary items not use at the moment. The reason may be excess, defect, breakage etc.*

E.g. of formats for necessary items *unnecessary items* record

No.	items	necessary	quantity	***unnecessary items***	quantity	group	

During recording you can use computer note book pen .write in cleared manner

A sample format for recording necessary items at the workplace.

Preparation date: Year Month Day

Prepared by 5S Committee

List of Stock at the Workplace

Process:	Process manager:	Line manager:	Date of check	

Target object			Quantity			Frequency of use				Common use		Storage	Remarks
Category	Item name/Part number	Control No.	Present	Regular	Red tag	a	b	c	d	A	B		

Category
A: Product, half-completed product, part or material
B: Facility, jig, tool or consumable material
C: Documentation(form, record, etc.)

Quantity
Present: Present quantity
Regular: Necessary quantity
Red tag: Surplus

Frequency of use
a: Everyday
b: A few times a week
c: A few times a month
d: A few times a year

Common use
A: Used by every worker
B: Used only by specific workers

A sample format for recording unnecessary items in the workplace

Preparation date: Year Month Day

List of Unused Items

Prepared by 5S Committee

Red Tag No.	Item name/ Part number	Site	Qty.	Date of Disposal	Reason to dispose									Disposal method					Others	Remarks
					A				B			C								
					1	2	3	4	1	2	3	1	2	3	Discard	Sell	Return	Use in other dept.	Repair	

◇Reason to dispose

A: Product, half-completed product, part or material	1. Unlisted and unused for a long period 2. Overproduced in-process stock beyond the capacity of the inter-process storage 3. Defect(processing/assembly/machining failure, or parts defect) 4. Others
B: Facility, jig, tool or consumable material	1. Unusable 2. Surplus 3. Others
C: Documentation(form, record, etc.)	1. Obsolete and unusable 2. Duplicate 3. Others

Self-Check 4	Written Test

Instructions: Answer all the questions listed below. Write your answers in the sheet provided in the next page.

1. write necessary items and ***unnecessary items*** in your work shop?(3 points)

Note: **Satisfactory rating - 3 points** **Unsatisfactory - below 3 points You** can ask you teacher for the copy of the correct answers.

Score_____

Rating:_____

Name: _____ Date: _____

Information Sheet-5	Using Red tag strategy.

5.1 Red tag strategy for unnecessary items

5.1.1 Overview of red tagging

The Red-Tag Strategy is a simple method for identifying potentially unneeded items in the factory or workshop, evaluating their usefulness and dealing with them appropriately. Red-tagging means putting red tags on items in the factory or workshop that need to be evaluated as being necessary or unnecessary. A Red tag is a red colored tag used to identify items no longer needed in a particular work area. The red tags catch people's attention because red is a colour that stands out. An item with a red tag is asking three questions:

- Is this item needed?
- If it is needed, is it needed in this quantity?
- If it is needed, does it need to be located here?

Once these items are identified, they can be held in a "Red Tag Holding Area" for a period of time to see whether they are needed, disposed of, relocated, or left exactly where they are.

red tag strategy standards

- red tag Red Tag Rules

  - When to Red Tag
  - How to Red Tag
  - What's go on the Red Tag

Rules for the Red Tag Holding Area

- When to clear out
- How to dispose of items
- More…

Red tag is a strategy card or identification card used to identify necessary item from unnecessary by applying red tag on Unecessary item.

Self-Check 5	Written Test

***Instructions**:* Answer all the questions listed below. Write your answers in the sheet provided in the next page.

1, write use of red tag in your work shop (3 points)

Note: **Satisfactory rating - 3 points** **Unsatisfactory - below 3 points** You can ask you teacher for the copy of the correct answers.

Score_____

Rating:_____

Name: _____ Date: _____

Information Sheet-6	**Evaluating and placing unnecessary items.**

Ideally, unnecessary equipment should be removed from areas where daily production activities take place. However, large equipment and equipment or machine attached to the floor may be expensive to move. It is sometimes better to leave this equipment where it is unless it interferes with daily production activities or prevents workshop improvements. Label this unneeded and difficult to move equipment with a “freeze” red tag, which indicates that its use has been “frozen,” but that it will remain in place for the time being.

Monitoring is a process to assess the advancement and constraints of work process. It should be conducted in a regular manner with standardization. Various check lists can be utilized for this purpose.

The information obtained from the monitoring is provided to the decision-making of process amendment and/or adjustment of the resource input for the smooth implementation of the work. Evaluation is, generally, an activity to review the entire process of the work for extracting lessons learnt both on positive and negative outcomes. The outcomes are thereafter analyzed to formulate Better plan of action in the forthcoming phase of the work. In the context of hospital management, in General, quarterly review of the management targets, such as productivity, quality of service, cost Control, delivery of services, safety issues and

morale of the workforce, is considered as the evaluation activities. Waste can be defined as any production activity that utilizes resources but does not add any value for the customer. Since these wastes add to the cost of products, they either reduce the profit the manufacturer makes or inflate the price that the customer needs to pay. In general, customers are not willing to pay for these activities because they do not benefit from them. Therefore, eliminating waste presents a great opportunity for businesses to cut costs and improve efficiency. When speaking about waste, lean experts usually refer to seven specifically. These include: transportation, inventory, motion, waiting, over processing, overproduction, and defects. Elimination of these seven kinds of waste can help companies reduce costs, increase employee engagement and customer happiness, and increase profits. The lean management and continuous improvement philosophy (Kaizen) attempt to decrease as much waste as possible.

Types of unnecessary items

Some of types of unnecessary items are:

- Defective or excess quantities of small parts and inventory
- Outdated or broken jigs and dies
- Worn-out bits
- Outdated or broken tools and inspection gear
- Old rags and other cleaning supplies
- Electrical equipment with broken cords
- Outdated posters, signs, notices, and memos

Self-Check 6	Written Test

***Instructions**:* Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers. Write your answers in the sheet provided in the next page.

1. List some of necessary? (7 points)
2. List at least seven items that are considered as unnecessary. (7 points)
3. Name places where unnecessary items are accumulated? (6 points)

Note: **Satisfactory rating - 17 points** **Unsatisfactory - below 17 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-7	**Recording and quantifying Necessary items.**

7.1 Record and quantify all items in the work area

The following sample formats can be used to record all necessary and unnecessary items.

Types of unnecessary items

Some of types of unnecessary items are:

- defective or excess quantities of small parts and inventory
- outdated or broken jigs and dies
- worn-out bits
- outdated or broken tools and inspection gear

- old rags and other cleaning supplies
- electrical equipment with broken cords
- outdated posters, signs, notices, and memos

Unused machinery or equipment

obsolete equipment

Places where unnecessary items accumulate

Some locations where unneeded items tend to accumulate are:

- in rooms or areas not designated for any particular purpose
- in corners next to entrances or exists
- Along interior and exterior walls, next to partitions, and behind pillars.
- Under the eaves of warehouses.
- under desks and shelves and in desk and cabinet drawers
- near the bottom of tall stacks of items
- on unused management and production schedule boards
- in tools boxes that are not clearly sorted

A sample format for recording all items at the workplace.

List of All the Items at the Workplace

No.	Name	Q'ty	Category

No.	Name	Q'ty	Category

7.2. Sort Necessary and unnecessary items

1. Decide Red tag Holding Areas
2. Attach red tag to unnecessary items
3. Taking unnecessary things to “Red tag Holding Areas“
4. Decision Making
5. Listing all unnecessary things in the Unused Article List

Listing all necessary things in the Shop Stock Use formats.

- First In First Out FIFO
- Setting Set-In-Order Rule
- Visual management

Self-Check 7	Written Test

Instructions*:* Answer all the questions listed below. Write your answers in the sheet provided in the next page.

1, Listing all necessary things in the Shop Stock Use formats?(3 points)

._____

_____

Note: **Satisfactory rating - 3 points** **Unsatisfactory - below 3points**

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

Information Sheet-8	Reporting performance results.

Reporting quantitative and qualitative results gained by implementing the 1st S – Sort using the following formats. All or some of the improvement indicators can be used.

Quantitative Results

Record tangible/quantitative results and changes that are achieved by applying Sort activity using the following indicators.

No	Improvement Indicators	Before Kaizen	Target	After Kaizen	Improvement (%)	Remark
1	Free floor space					
2	Searching time for tools, materials, etc					
3	Transaction made/income generated					
4	Labor saving					
5	Parts saving					
6	Tools& Equipment found					
7	Raw Material saving					
8	Transportation/travel					
9	Inventory					

10	Lead time					
11	Machine down time					
12	Frequency of Machine failure					
13	Production volume per day					
14	Labour productivity					
15	Delivery Time					
16	Defect rate					
17	Number of Customer complaints					
18	Minimized Cost of Production					

Qualitative Results

Record intangible/qualitative results and changes that are achieved by applying Sort activity using the following indicators.

No	Improvement Indicators	Description of the Result
1	Knowledge of the 1st S - Sort	
2	Team work	
3	Morale of workers	
4	Communications between workers by removing unnecessary materials	
5	Corporate culture of kaizen	
6	Fatigue or stress	

7	Relationship with customers	
8	Awareness of safety	
9	Orderliness of work place	
10	Other	

Self-Check 8	Written Test

***Instructions**:* Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers. Write your answers in the sheet provided in the next page.

1. **What is the importance of reporting quantitative and qualitative results? (6points)**

Note: **Satisfactory rating - 6 points** **Unsatisfactory - below 6 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-9	Checking necessary items

Pre-operational and safety checks

Per-operational conditions that should be considered are selecting the required type of tools, equipment's and machineries restoring and check them functional in relation to safety verification of tools, equipment and machineries. Here we have to have all the required materials with functional condition and its safety should be checked and demonstrated before starting any operations of arboricultural works. Because any mistakes done before operation may result in harm and injury.

1. Every employer shall nominate a competent person to be in charge of each operation. That person shall exercise such supervision as will ensure that the work is performed in a safe manner at all times. A competent person shall be nominated to take charge if it is necessary for this person to leave the operation.
2. Every employer shall exercise such supervisions will ensure that work is performed in a safe manner at all times.

Use this format for reporting necessary item

Preparation date: Year Month Day

Prepared by 5S Committee

List of Stock at the Workplace

Process:	Process manager:	Line manager:	Date of check	

Target object			Quantity			Frequency of use				Common use		Storage	Remarks
Category	Item name/Part number	Control No.	Present	Regular	Red tag	a	b	c	d	A	B		

Category
A: Product, half-completed product, part or material
B: Facility, jig, tool or consumable material
C: Documentation(form, record, etc.)

Quantity
Present: Present quantity
Regular: Necessary quantity
Red tag: Surplus

Frequency of use
a: Everyday
b: A few times a week
c: A few times a month
d: A few times a year

Common use
A: Used by every worker
B: Used only by specific workers

Self-Check -9	**Written Test**

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. What pre-operational and safety checks on tools, equipment and machinery would be conducted in ground support operations? (4 point)

Note: **Satisfactory rating - 2 points and above** **Unsatisfactory – below 2 points**

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Operation Sheet 3	Performing cleaning

Objectives: To Performing cleaning Techniques:

Procedures

Step 1- wear PPE.

Step 2- select required tools and materials

Steps 3- arrange your material based on their order

Steps 4- clean the material with water.

Step 5- avoid unnecessary material

Step 6-store in dry place materials

Step 7- use necessary materials for the next

LAP Test 3	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

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

Task 1: prepare a plan to Performing cleaning activity in your workshop.

Task 2: Following the steps for using 3S Map, draw before and after map/ layout of your work shop.

Task 3: Following the procedures of performing cleaning activity in the assigned workshop.

List of Reference Materials

4. 5S Training of Trainers for Training Institutions
5. Journals/publications/magazine
6. 5S / Visual Workplace Handbook of Brady

HORTICULTURAL CROPS PRODUCTION

LEVEL I

Learning Guide -10

Unit of Competence: Apply 3S

Module Title: Applying 3S

LG Code: AGR HCP1 M03 LO4-LG10

TTLM Code: AGR HCP1TTLM031219v1

LO 4: Set all items in order

Instruction Sheet	Learning Guide #10

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

- Preparing plan.
- .Performing general cleaning activities.
- . Deciding Location/layout, storage and indication methods.
- . Preparing and using tools and equipment.
- . Placing Items in their locations.
- .Returning items after use.
- . Reporting performance results.
- . Checking items.

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 plan.
- Perform general cleaning activities.
- Decide Location/layout, storage and indication methods.
- Prepare and use tools and equipment.
- Place Items in their locations.
- Return items after use.
- Report performance results.
- Check items.

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 3 to 7.
3. Read the information written in the “Information Sheets 1-8”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
4. Accomplishthe“Self-checks1,2,3,4,5,6,7and8” **in page-.** 102,104,106,108,110,111,114, and 117
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-check 1).
6. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.
7. Submit your accomplished Self-check. This will form part of your training portfolio.

Information Sheet-1	Preparing Plans to implement set in order activities

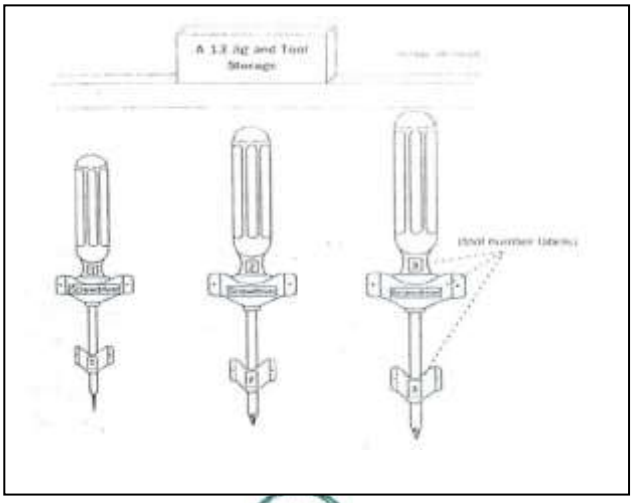
1.1 Explanation of the second pillar of 5S – Set in order

1.1.1. Definition of set in order

Sorting step focuses on the elimination of any unnecessary workplace clutter. In a process called “red tagging,” all workplace items are sorted through, with a red tag placed on any that are not absolutely necessary for completing a task. Once tools, supplies, materials and equipment have been tagged, they are then relocated to a holding area for a follow up evaluation. Items that are only seldom used can be stored closer in proximity to the workspace, while obsolete clutter should be discarded.

Suiting’s benefits include: a more effective use of space, simplified tasks, a reduction in hazards, and a significant decrease in distracting clutter

Set in order means arranging necessary items so that they are easy to use and labelling them so that anyone can find them and put them away. The key word in this definition is “anyone”. Set in order can be implemented only when the first pillar- sort is done first. No matter how well you arrange items, set in order can have little impact if many of the items are unnecessary and not sorted. Similarly, if sorting is implemented without setting in order, it is much less effective. Where necessary items should be placed should be made clear for anyone to immediately find them and return them easily. Hence, Sort and Set in order work best, when they are implemented together.



Set in order of tools

1.2. Benefits of set in order

Setting in order is important because it eliminates many kinds of waste from operations in a workplace. These include searching time waste, waste due to difficulty in using items, and waste due to difficulty in returning items. In general, the following problems and wastes are avoided when set in order is well implemented.

1. Motion wastes
2. Searching time wastes
3. The waste of human energy
4. The waste of excess inventory
5. The waste of defective products
6. The waste of unsafe conditions

The set in order step is actually at the core of so many important business principles such as safety, ergonomics, quality, inventory control, productivity, standard work, the visual workplace and employee morale. Also it is the core of standardization. This is because the workplace must be organized before any type of standardization can be implemented effectively. Standardization means creating a consistent way of doing or carrying out tasks. When we think of standardization, we have to think about anyone. For example, machinery standardization means anyone can operate the machinery. Also if we have operation standardization this means anyone can perform the operation. Even for people to get along together, they need to standardize their behaviors, at least to some extent

Set in order is the core of standardization.

In implementing set in order pillar, we use visual controls so that communications became easy and smooth. For example, we can visually know where items are placed and where to return them and so on. A visual control is any communication device used in the workplace that tells us at a glance how work should be done. Through visual controls, information such as where items belong, how many items should be placed there, what the standard procedure is for doing something, the status of work in process etc can be communicated.

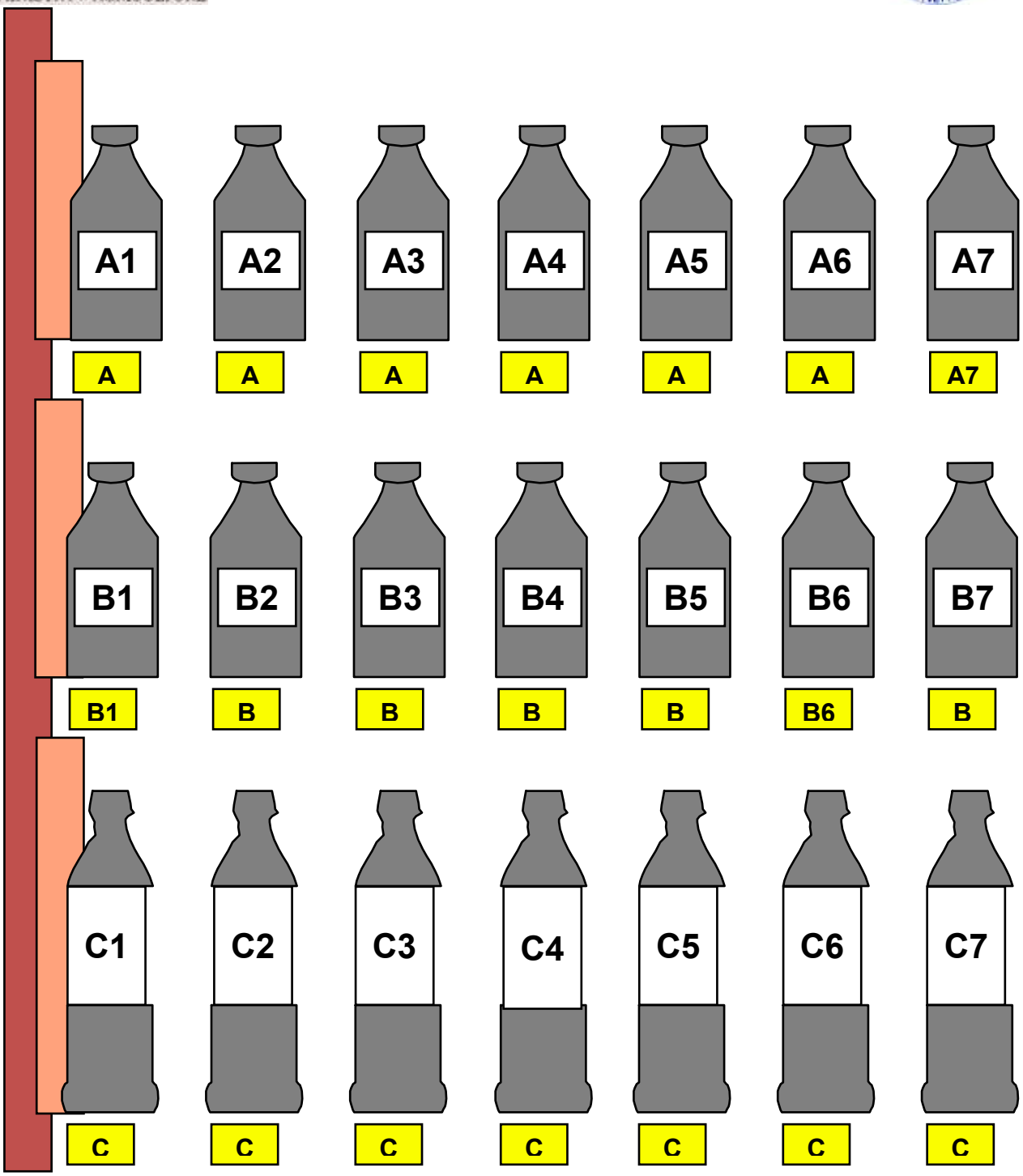


Fig. item grouping order

3. Implementing the Second Pillar of 5S – Set in order

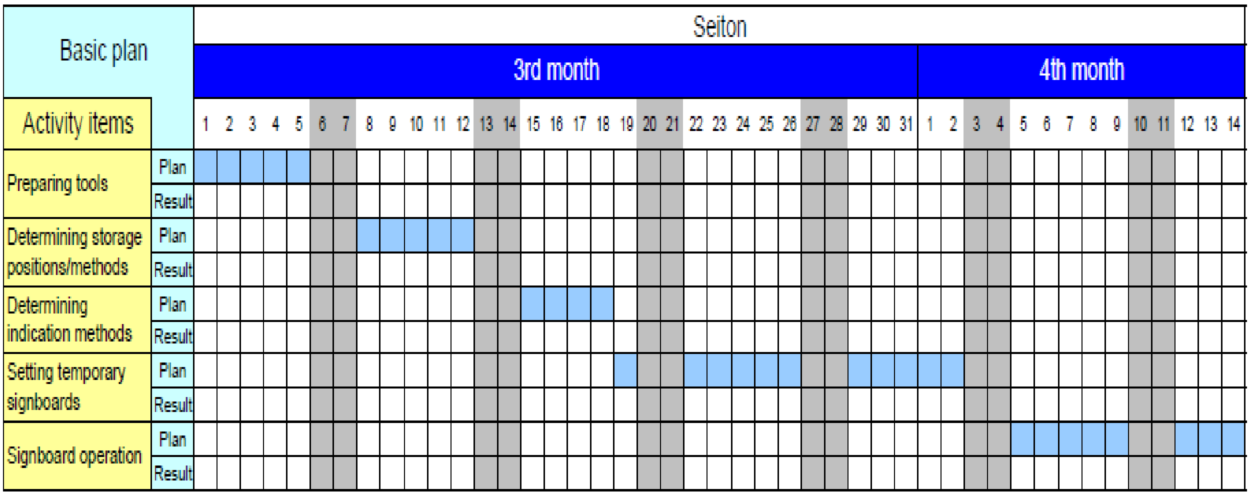
1.3. Plan and procedures for set in order

Set in order activity plan sheet (sample)

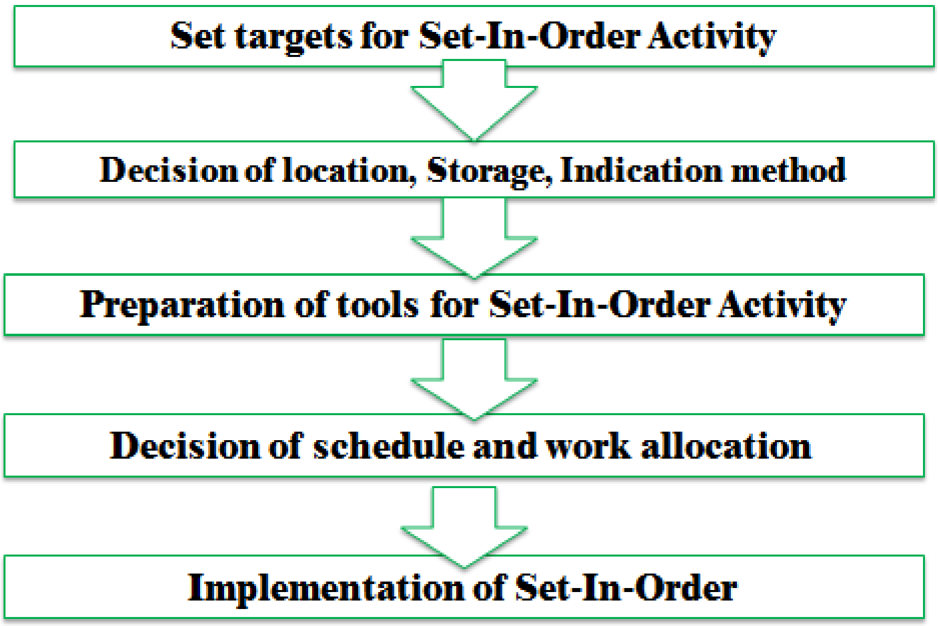
Area: M-1

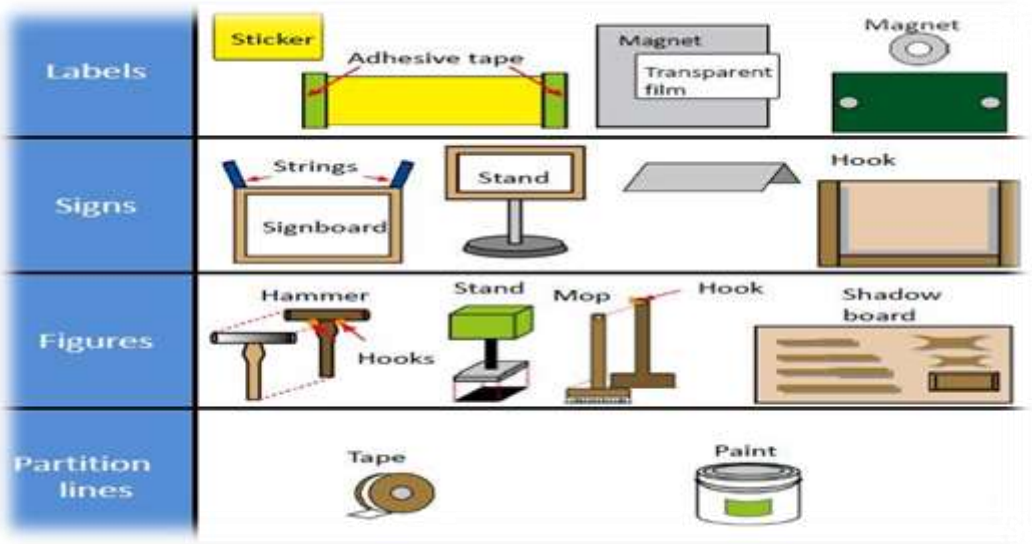
Date of issue:

Issued by: 5S Committee



Procedures for Set in order





There are some principles for deciding best locations for tools and equipments. Jigs, tools and dies differ from materials, equipments, machinery and parts in that they must be put back after each use. Some of the principles for jigs, tools and dies also apply to parts, equipments, and machinery. These are:

- Locate items in the workplace according to their frequency of use. Place frequently used items near the place of use. Store infrequently used items away from the place of use.
- Store items together if they are used together, and store them in sequence in which they are used.

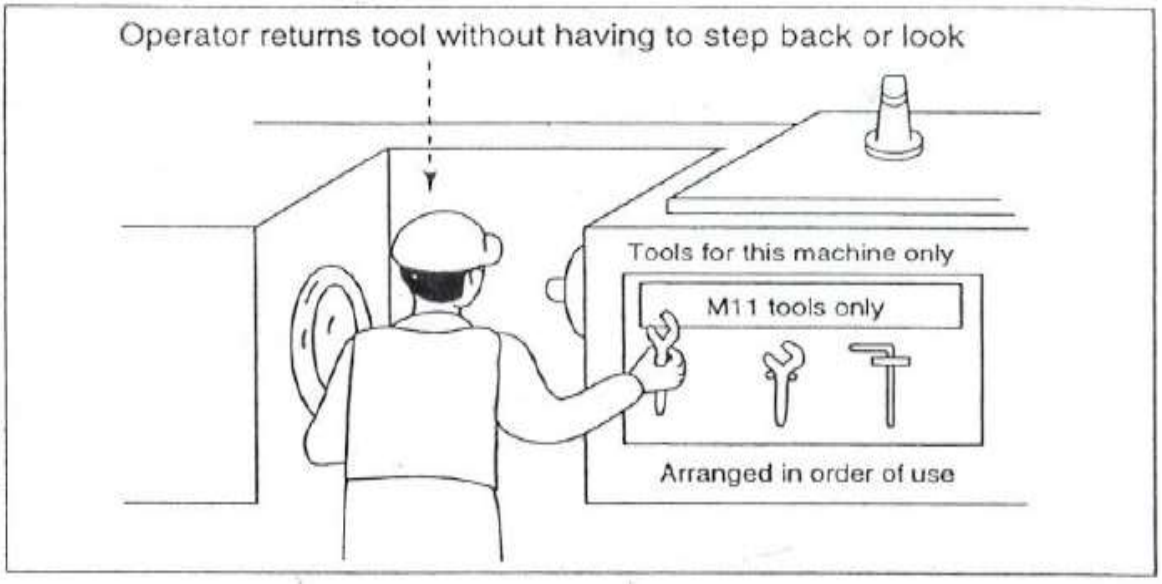


Fig. Tools kept at hand and stored in the order used.

- Device a “just let go” arrangement for tools. This approach involves suspending tools from a retractable cord just within reach so that they will automatically go back in to their correct storage position when released.
- Make storage places larger than the items stored there so that they are physically easy to remove and put back.
- Eliminate the variety of jigs, tools and dies needed by creating a few jigs, tools and dies that serve multiple functions.
- Store tools according to function or product. Function-based storage means storing tools together when they have similar functions. This works best for job-shop production. Product-based storage means storing tools together when they are used on the same product. This works best for repetitive production.

There are principles helpful in deciding the best locations for parts, equipments, and machinery, as well as tools by removing motion wastes. Motion wastes are unnecessary movements created when people move their trunks, feet, arms, and hands more than needed to perform a given operation. These wastes lead to waste of time, energy and effort. These motion wastes can be minimized by locating parts, equipments, and machinery in the best locations possible. More important than removing motion wastes is asking why it occurs. By asking ‘why’ we can find the methods of manufacturing that work and approach the zero-waste mark. Eliminating the unnecessary motions from existing operations is called *Motion improvement*. And finding ways to eliminate the whole operations to remove the wastes is called *Radical improvement*.

The principles that are helpful to eliminate or reduce motions that operators make are:

Principle 1: Start and end each motion with both hands moving at once.

Principle 2: Both arms should move symmetrically and in opposite directions.

Principle 3: Keep trunk motions to a minimum.

Principle 4: Use gravity instead of muscle.

Principle 5: Avoid zigzagging motions and sudden changes in direction.

Principle 6: Move with a steady rhythm.

Principle 7: Maintain a comfortable posture with comfortable motions.

Principle 8: Use the feet to operate on and off switches for machines where practical.

Principle 9: Keep materials and tools close and in front.

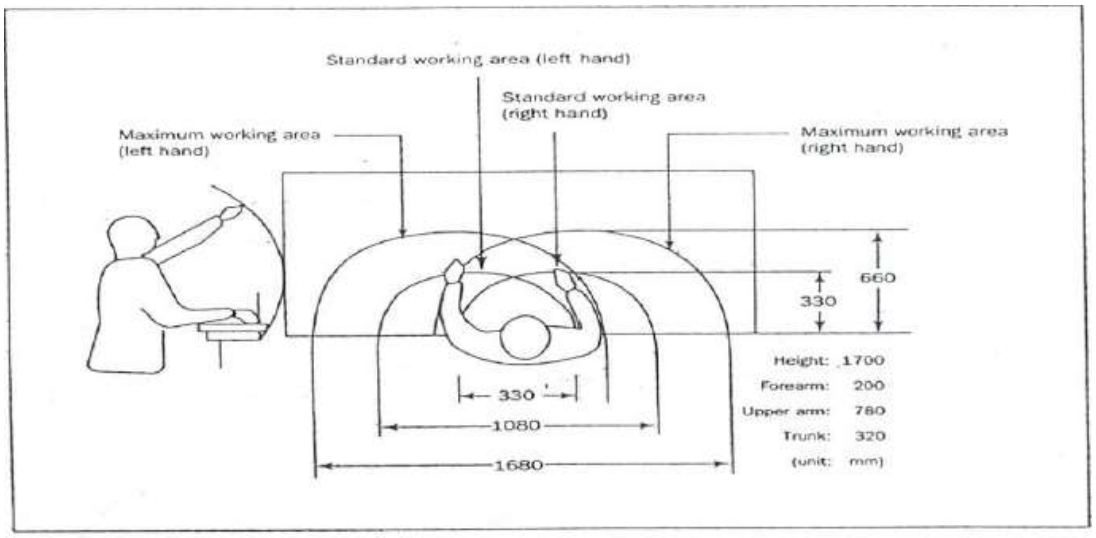


Fig. Guidelines for locating parts, equipment's, and machinery to maximize motion efficiency.

Principle 10: Arrange materials and tools in the order of their use.

Principle 11: Use inexpensive methods for feeding in and sending out materials.

Principle 12: Stand at a proper height for the work to be done.

Principle 13: Make materials and parts easy to pick up.

Principle 14: Make handles and grips in efficient, easy-to-use shapes and positions.

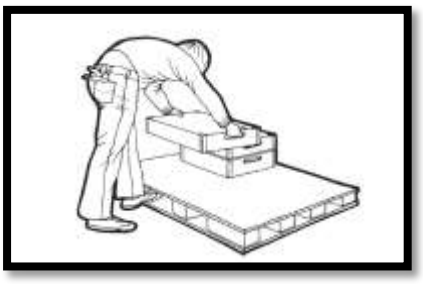


Fig. Motion wastes

Fig. No waste of motion

Example of eliminating motion wastes

Improving the retrieval of parts

The figure below shows an improvement in picking up parts in an assembly work. Before improvement, the worktable was so large that the assembly worker had to stretch to pick up parts. Also, the parts boxes were laid flat at table level, making it difficult to reach inside them. After improvement, the decreased width of the worktable enabled the assembly worker to reach the parts without stretching his arm too far. Also the parts boxes set on an inclined surface to make their contents more accessible.

Improving the layout of parts

The following figure shows an improvement in how plastic packaging sheets are used. The sheets are moved from a rack behind the operator to a hook in front of the operator and above the production line. This improvement eliminates four seconds of motion waste from each unit of packing work.

Evaluating current locations and deciding best locations

The 5S Map is a tool that can be used to evaluate current locations of parts, jigs, tools, dies, equipment, and machinery, and to decide best locations. 5S Map involves creating two maps ‘before map’ and ‘after map’. The ‘before map’ shows the layout of the workplace before implementing set in order. The ‘after map’ shows the workplace after implementing set in order. The 5S Map can be used to evaluate the locations in a small or large workplaces, like in a single workstations, on a production line, or in a department.

The steps of using the 5S Map:

1. Make a floor plan or area diagram of the workplace you wish to study. Show the location of specific parts, inventory, tools, jigs, dies, equipment and machinery.
2. Draw arrows on the plan showing the work flow between items in the workplace. There should be at least one arrow for every operation performed. Draw the arrows in the order that the operations are performed, and number them as you go.

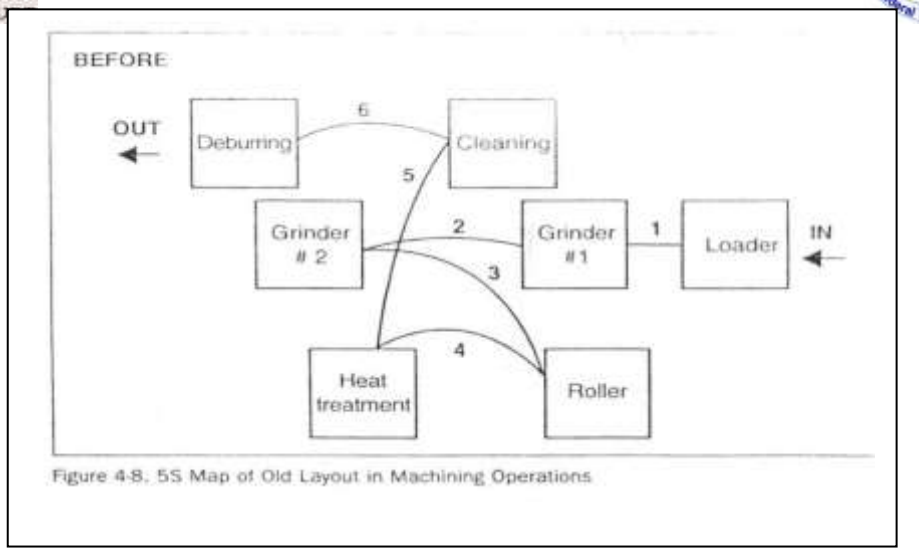


Figure 4-8. 5S Map of Old Layout in Machining Operations

Fig. 5S Map of old layout in machining operations (‘before map’)

3. Look carefully at the resulting “spaghetti diagram”. Can you see places where there is congestion in the work flow? Can you see ways to eliminate waste?
4. Make a new 5S Map to experiment with a better layout for this work place. Again, draw and number arrows to show the flow of operations performed.
5. Analyze the efficiency of the new layout (the after map), based on the principles explained in the above.
6. Continue to experiment with possible layouts (after maps) using the 5S Map until you find one which you think will work well.

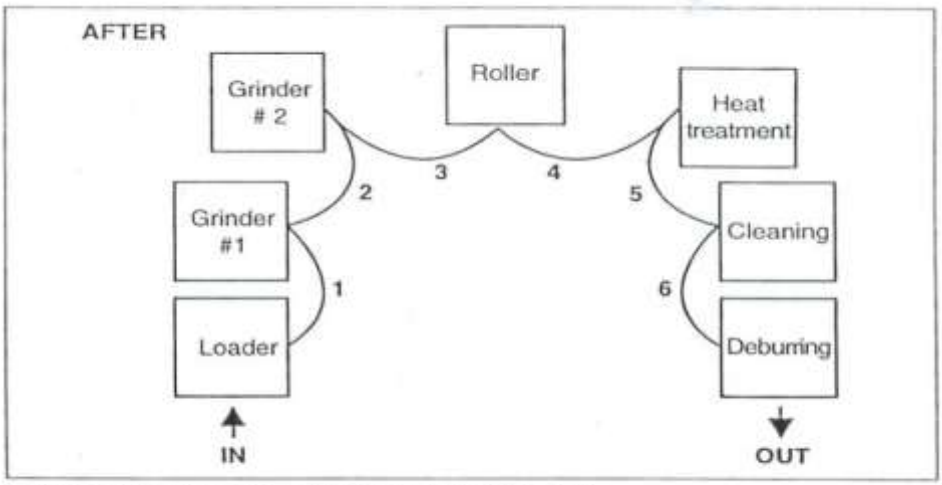


Fig. 5S Map of new layout (the after map) in machining operations.

7. Implement this new layout in the work place by moving parts, tools, jigs, dies, equipment, and machinery to their new locations.
8. Continue to evaluate and improve the layout in the workplace.

3.1. Set in order strategies

Once best locations have been decided, it is necessary to mark these locations so that everyone knows what goes where, and how many of each item belongs in each location. There are several strategies for marking or showing what, where and how many.

3.1.1. Motion Economy strategy

Following the principles explained in the above, we can remove motion waste from existing operation. By using human body appropriately, by organizing the workplace and by redesigning of tools and equipments, we can minimize motion waste.

3.1.2. Visual control Strategy

A visual control is any communication device used in the work environment that tells us at a glance how work should be done. There are several strategies for setting in order items so that to easily identify what, where and how many (visual control). These visual control strategies are discussed in the next contents.

Signboard strategy: uses signboards to identify what, where, and how many. The three main types of signboards are:

- Location indicators that show where items go.
- Item indicators that show what specific items go in those places.
- Amount indicators that show how many of these items belong there.

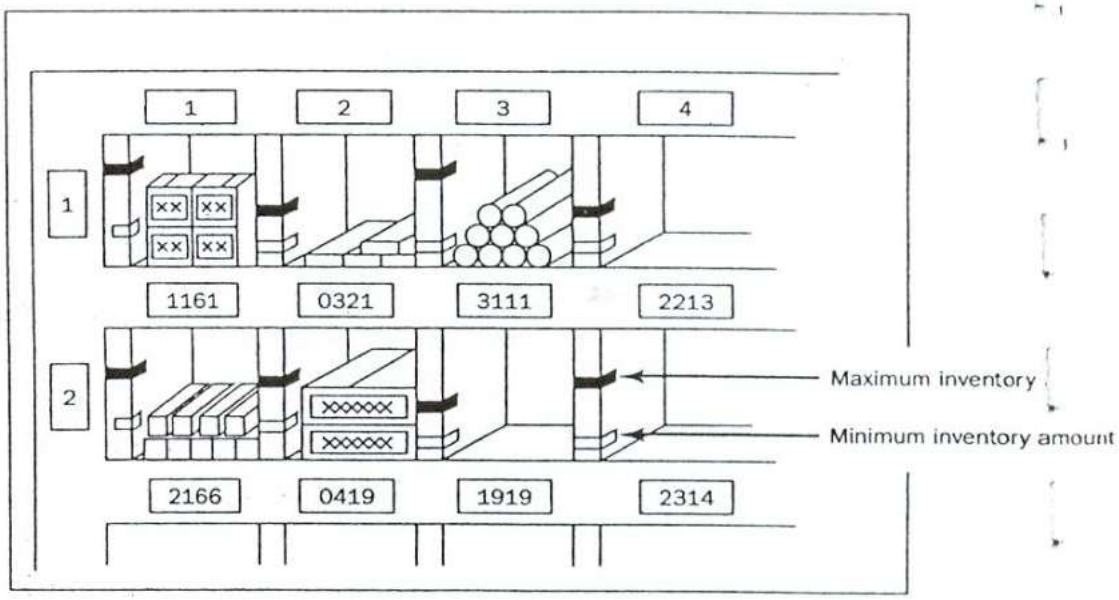


Fig. Amount indicators

Signboards are often used to identify:

- Names of work areas
- Inventory locations
- Equipment storage locations
- Standard procedures
- Machine layout

For example, in order to identify inventory stored on shelves in a warehouse, a whole system of signboards may be used. Every section of shelving may have a signboard identifying the section. Within that section, vertical and horizontal addresses on shelves can be identified with additional signboard. Each item stored on the shelve may also have a signboard showing the “return address” for that item. The “return address” allows the item to be put back in the proper location once it has been removed.

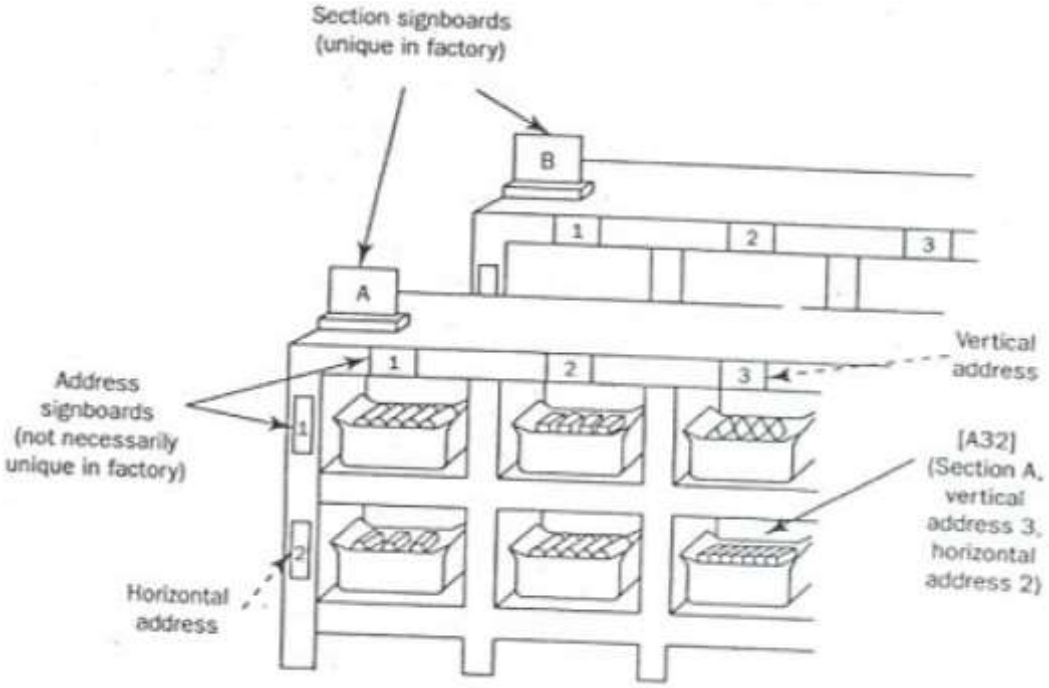


Fig. Location indicators on shelves

The ‘after 5S Map’ discussed before is a kind of signboard. It shows the location of parts, tools, jigs, dies, equipment, and machinery in a given work area after set in order is implemented. When posted in the work place, it is useful in communicating the standard for where items are located.

Painting strategy: is a method for identifying locations on floors and walkways. It is called the Painting strategy because paint is the material generally used. But also plastic tape, cut in to any length, can be used. Plastic tape, although more expensive, shows up just as clearly as paint and can be removed if the layout is changed.

The painting strategy is used to divide the factories or workshop’s walking areas (walkways) from the working areas (operation areas). When putting lines to divide walkways from operation areas, the following factors should be considered:

- U-shaped cell designs are generally efficient that straight production lines.
- In-process inventory should be positioned carefully for best production flow.
- Floors should be levelled or repaired before we put lines.

- Walkways should be wide enough to avoid twists and turns and for safety and a smooth flow of goods.
- The dividing lines should be between 2 and 4 inches in width.
- Paint colors should be standardized. For example
  - operation areas are painted by green;
  - walkways are fluorescent orange or red;
  - Lines that divide the walkways from operation areas are yellow in color.

Dividing lines can be used to show:

- Cart storage locations,
- aisle directions,
- door range, to show which way a door swings open,
- for worktables,
- tiger marks, to show areas where inventory and equipment should not be placed, or to show hazardous areas.

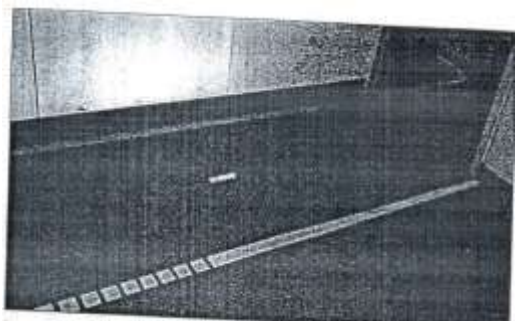


Fig. Aisle direction line

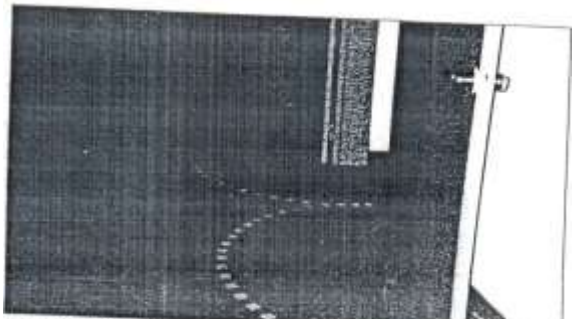


Fig. Door-range line

Color-code strategy: is used to show clearly which parts, tools, jigs and dies are to be used for which purpose. For example, if certain parts are to be used to make a particular product, they can all be color-coded with the same color and even stored in a location that is painted with that color. Similarly, as shown the picture in below, if different types of lubricants are to be used on different parts of a machine, the supply containers, oil cans, and machine parts can be color-coded to show what is used where.

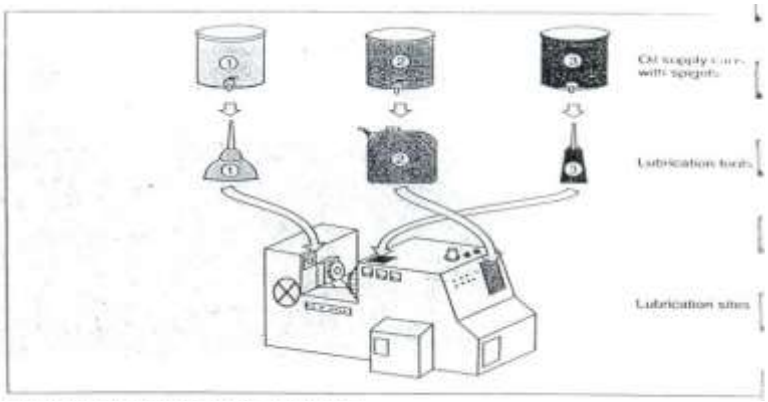
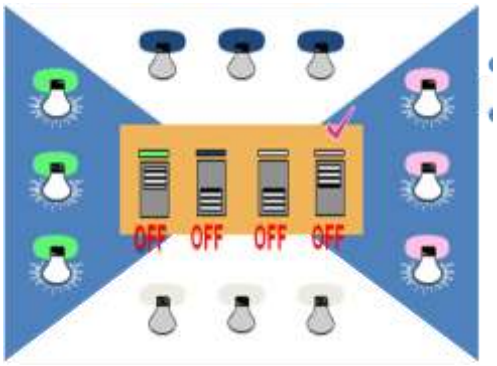


Fig. Color-coding for lubrication



Outlining strategy: is used to show which jigs and tools are stored where. Outlining simply means drawing outlines of jigs and tools in their proper storage positions. When you want to return a tool, the outline provides an additional indication of where it belongs.

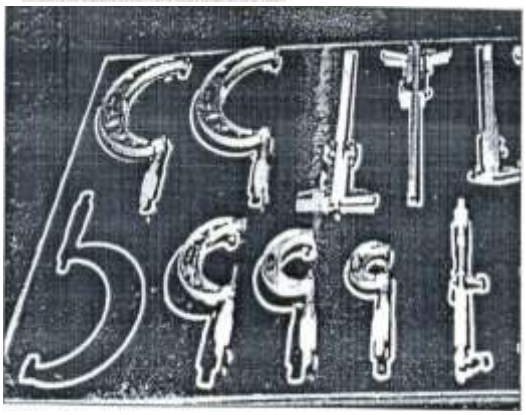
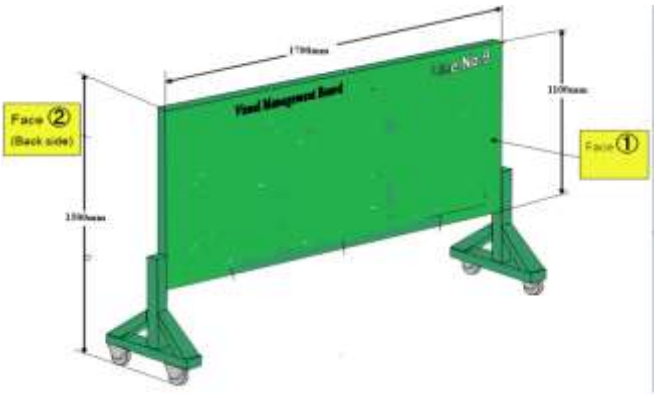


Fig. Outlining of tools to show their locations

Fig. Outlining of tools and equipments to show their locations

Visual Management Board (Kaizen board) Strategy



Self-Check 1	Written Test

***Instructions**:* Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers. Write your answers in the sheet provided in the next page.

1. Give definition of the second pillar of 5S – Set in order. (3 points)
2. What are the benefits of implementing set in order? (4 points)
3. What are the procedures for set in order? (5 points)
4. What are the principles for deciding best locations of tools and equipments? (6 points)
5. What is 5S Map? (2 points)
6. List the steps of using the 5S Map? (4 points)
7. What are the strategies for implementing set in order? (3 points)
8. What factors should we follow when applying the painting strategy? (6 points)
9. What are the three standardized colors used for dividing and marking walkways and operation areas? (3 points)

Note: **Satisfactory rating - 20 points** **Unsatisfactory - below 20 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

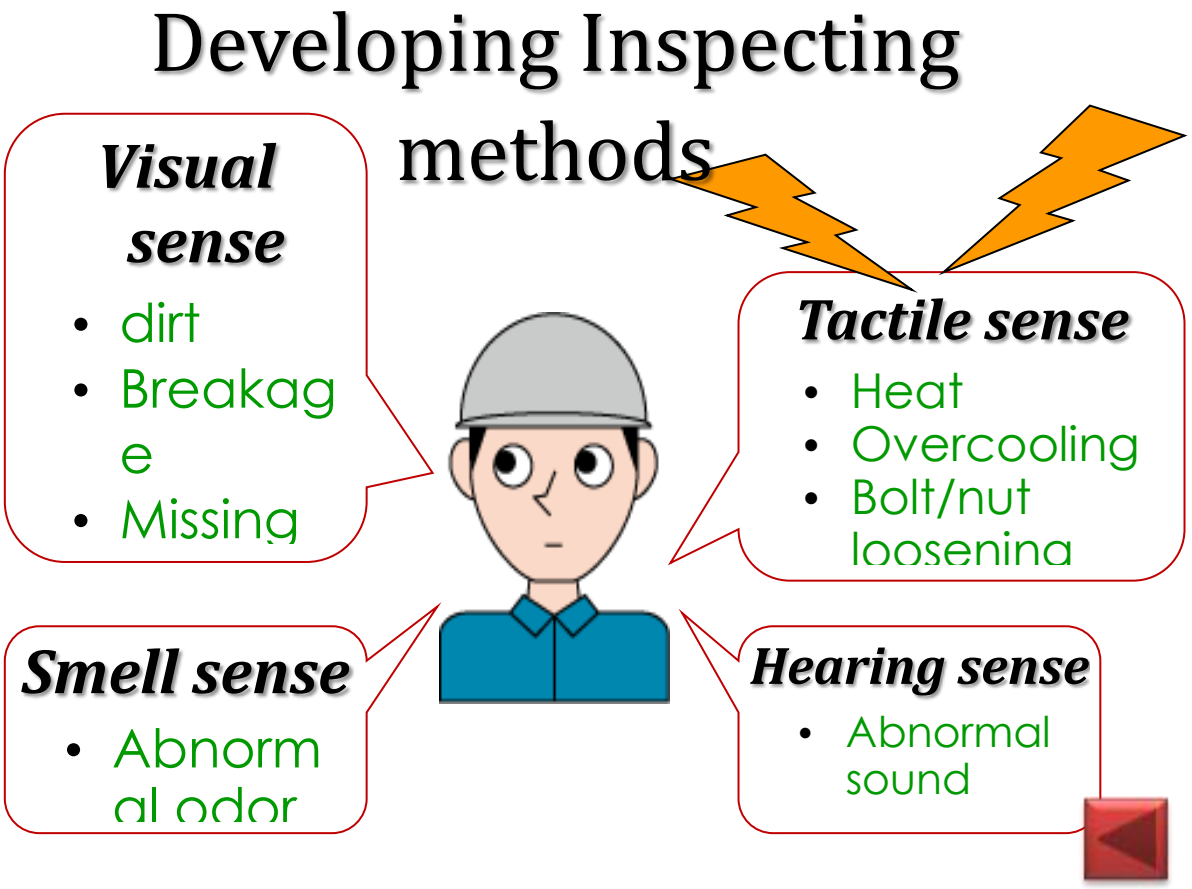
Information Sheet-2	Perform general cleaning activities.

2.1 Perform general cleaning activities

To clean and inspect the workplace thoroughly so that there is no dirt on the floor, machines and equipment's.

Cleaning/ Shine: is the 3rd of the five components of 5S. It means cleaning equipment, facilities and floor space in the workplace, and ensure that they are in good operating condition. In every activity after the accomplishing of the work cleaning is done.

** Determine shine methods



Self-Check 2	Written Test

Instructions: Answer all the questions listed below. Write your answers in the sheet provided in the next page.

1, when does cleaning activity is conducted? (3 points)

Note: **Satisfactory rating - 3 points** **Unsatisfactory - below 3 points** You can ask you teacher for the copy of the correct answers.

Score_____

Rating:_____

Name: _____ Date: _____

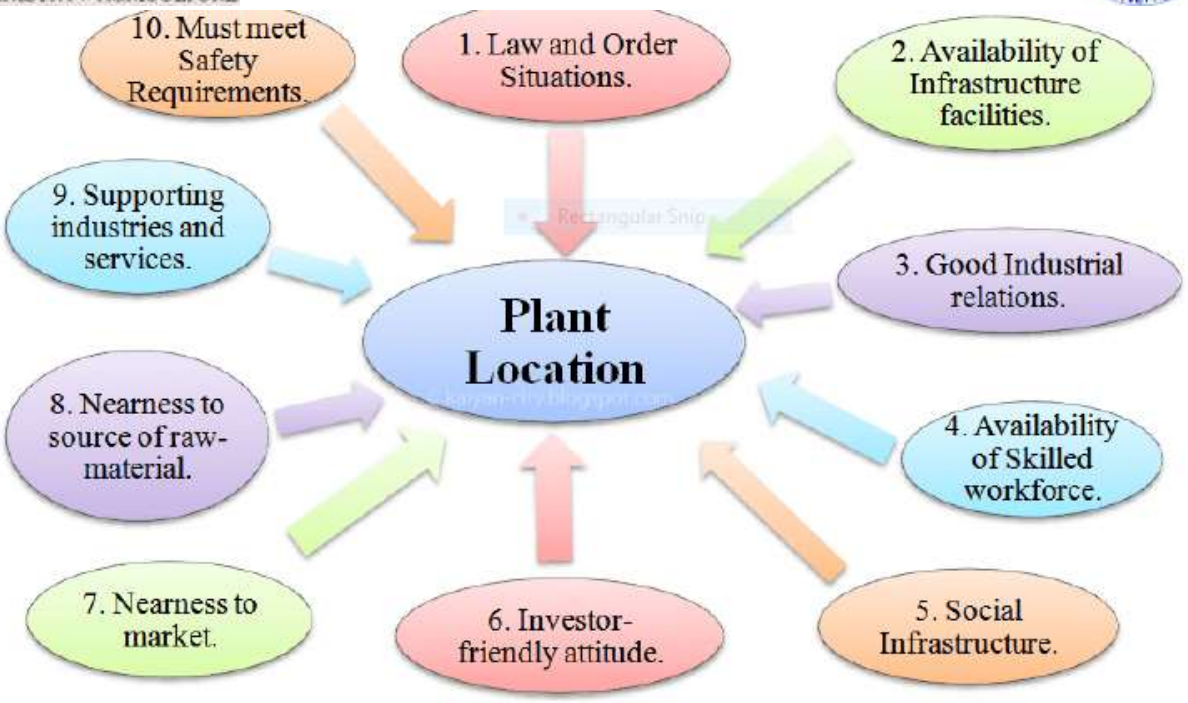
Information Sheet-3	Deciding Location/layout, storage and indication methods for items

The following image depicts important factors affecting a plant location.

The ten main factors that affect a plant location are as follows:

1. Law and order situation,
2. Availability of infrastructure facilities,
3. Good industrial relations,
4. Availability of skilled workforce,
5. Social infrastructure,
6. Investor friendly attitude,
7. Nearness to market,
8. Nearness to raw-materials' source,
9. Nearness to supportive industries and services, and
10. Must meet safety requirements.

Now let's discuss above factors affecting the location of a plant.



Factors affecting plant location

Self-Check 3	Written Test

Instructions: Perform the following tasks. Write your answers in the answer sheet provided:

1. List at least five main factors that affect a plant location. (5 points)

Note: **Satisfactory rating – 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-4	Preparing and using tools and equipment.

4.1. Tools and materials used to implement Sort activity

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…)

Tools and materials used to implement set in order

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

Tools and materials used to implement shine

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

- Sponge
- oil
- Broom
- detergent s
- Brush
- spade
- vacuum cleaner
- bolts
- garbage containers
- floor scrubber cleaning Pads

Self-Check 4	Written Test

Instructions: Perform the following tasks. Write your answers in the answer sheet provided:

1. List at least five me tools and materials used to implement Sort. (5 points)
2. List at least six tools and materials used to implement Set in order. (6 points)
3. List at least seven tools and materials used to implement Shine. (7 points)

Note: **Satisfactory rating - 18 points** **Unsatisfactory - below 18 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-5	Placing Items in their locations

Items should be placed at appropriate place and location

- tools
- jigs/fixtures
- materials/components
- machine and equipment
- manuals
- documents
- personal items (e.g. bags, lunch boxes and posters)
- safety equipment and personal protective equipment
- other items which happen to be in the work area

The following image depicts important factors affecting a plant location.

The ten main factors that affect a plant location are as follows:

1. Law and order situation,
2. Availability of infrastructure facilities,
3. Good industrial relations,
4. Availability of skilled workforce,
5. Social infrastructure,
6. Investor friendly attitude,
7. Nearness to market,
8. Nearness to raw-materials' source,
9. Nearness to supportive industries and services, and
10. Must meet safety requirements.

Now let's discuss above factors affecting the location of a plant.

Self-Check 5	Written Test

Instructions: Perform the following tasks. Write your answers in the answer sheet provided:

1. List at least five items? (5 points)

Note: **Satisfactory rating – 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-6	Returning items after use

After completion of your work all necessary materials should be returned into their storage place because to increase their shelf life materials store in appropriate place

These and other items should be returning to necessary places

- tools
- jigs/fixtures
- materials/components
- machine and equipment
- manuals
- documents
- personal items (e.g. bags, lunch boxes and posters)
- safety equipment and personal protective equipment
- other items which happen to be in the work area

After completion of every activity in all equipment's should returned and placed at appropriate place. It should not be placed on the ground because of rust if it is metal like chisel, uncapping fork and knife, metal sheet, etc. The area should be free from combustible materials, broken items, plastics, newspaper and disposed according to waste disposal system.

Self-check-6	Written

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Why all items are returned to the original place after completion the work? (3pts)

Note: **Satisfactory rating - 3 points** **Unsatisfactory - below 3 points**

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-7	Reporting performance results.

Reporting quantitative and qualitative results gained by implementing the 1st S – Sort using the following formats. All or some of the improvement indicators can be used.

Quantitative Results

Record tangible/quantitative results and changes that are achieved by applying Sort activity using the following indicators.

No	Improvement Indicators	Before Kaizen	Target	After Kaizen	Improvement (%)	Remark
1	Free floor space					
2	Searching time for tools, materials, etc					
3	Transaction made/income generated					
4	Labor saving					
5	Parts saving					
6	Tools& Equipment found					
7	Raw Material saving					
8	Transportation/travel					
9	Inventory					
10	Lead time					

11	Machine down time					
12	Frequency of Machine failure					
13	Production volume per day					
14	Labour productivity					
15	Delivery Time					
16	Defect rate					
17	Number of Customer complaints					
18	Minimized Cost of Production					

Qualitative Results

Record intangible/qualitative results and changes that are achieved by applying Sort activity using the following indicators.

No	Improvement Indicators	Description of the Result
1	Knowledge of the 1st S - Sort	
2	Team work	
3	Morale of workers	
4	Communications between workers by removing unnecessary materials	
5	Corporate culture of kaizen	
6	Fatigue or stress	
7	Relationship with customers	
8	Awareness of safety	

9	Orderliness of work place	
10	Other	

Self-Check 7	Written Test

***Instructions**:* Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers. Write your answers in the sheet provided in the next page.

1. **Define Quantitative Results? (5 points)**

Note: **Satisfactory rating – 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-8	Checking items.

Meaning of work

Work is central in many cultures, although every culture has its own values and conceptions about it. However, it seems that work is important and significant for a majority of people considering the time that individuals devote to work in their lives, the numerous functions which it accomplishes for them, and the fact that work is closely linked with other important aspects of daily life such as family, leisure, religion, and community life. As general there is no clear cut meaning of work but every sector define work in accordance with her/his organization/institution goals. Having saying this now let us see what do you mean complete work. If there is work, always also completion of work. Simply Complete work means for shoes factory is shoes /final product/ or for farmer wheat, maize and barley are complete work b/c he/she achieve goal. So achieving of own goal is complete work for all.

Meaning of work standard

A 'standard' is a result of a particular standardization effect, approved by the recognized authority. It may take the form of a document containing a set of conditions to be fulfilled, a fundamental unit or physical constituent or an object for physical comparison.

Standardization is the process of formulating and applying the rules for an orderly approach to a specific activity - for the benefit of all - with the co-operation of all concerned and in particular for the promotion of optimum overall economy, taking due account of functional conditions and safety requirements. Standardization is based on the consolidated results of science, technology and experience. It determines not only the basis for the present but also for future development and it should keep pace with advances.

In the context of all these factors, application of standards and standardization for agriculture can play a vital role in putting the agriculture on a sound footing for developing domestic and international markets.

With development teams of two or three in daily contact and frequently exchanging views and criticisms, detailed, written quality and task-completion checking procedures may be felt

to be unnecessary. Procedures still need to be agreed and the results need to be documented. The need to check quality and task completion applies at all stages of the development process but is underlined especially during the prototype validation stages.

The importance of documenting checks applies whatever the size of the team and whatever the complexity of the software. In the production of assets, this may involve checking to confirm the following:

- that all the asset files listed in the product specification document have been produced;
- that files are correctly named;
- that files are the correct byte size or near the projected file size (examining the file-sizes in a directory listing can be helpful in identifying problem files which are either much too large or much too small);
- that files are the correct resolution (screen-size and bit-depth in the case of graphics; duration, sampling frequency and bit-depth in the case of sound files);
- That the quality of files displaying on the target monitor or heard on target listening equipment is acceptable.

Note that sampling is seldom a satisfactory checking method. Checking should be exhaustive, unless for reasons of time or economy this is impossible. Usually, however, trying to economize on checking and testing is a false economy and cutting corners here will often come back to haunt the development team. At the end of the day, all files will need to be tested and, if at all possible, this should be done sooner rather than at a later trial stage.

Workplace Procedure

Workplace procedure is a set of written instructions that identifies the health and safety issues that may happen from the jobs and tasks that make up a system of work.

A safe working procedure should be written when:

- designing a new job or task
- changing a job or task
- introducing new equipment

- reviewing a procedure when problems have been identified, example from an accident or incident investigation

The safe working procedure should identify:

- the teacher for the task or job and the students who will undertake the task
- the tasks that are to be undertaken that pose risks
- the equipment to be used in these tasks
- the control measures that have been formulated for these tasks
- any training or qualification needed to undertake the task
- the personal protective equipment to be worn
- action to be undertaken to address safety issues that may arise while undertaking the task

Following certain procedures is very important to perform a given operation. The table below shows different elements and their corresponding performance criteria to be able to identify occupational health and safety hazards, and assess risk, as well as follow instructions and procedure in the workplace with minimal supervision. The students will also be capable of participating and contributing to OHS management issues

Self-Check -8	**Written Test**

Directions: Answer all the questions listed below

1. **What is workplace Procedure? (5 points)**
2. **Identify safe working procedure? (5 points)**

Note: **Satisfactory rating - 10 Unsatisfactory - below 10**

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Operation Sheet 4	Tools and materials used to implement Sort activity

Objectives: To Prepare Tools and materials used to implement Sort activity

Procedures

Step 1- wear PPE.

Step 2- select required tools and materials

Steps 3- select your material based on their size

Steps 4- put the material based on their group

Step 5- keep material safety

List of Reference Materials

1. 5S Training of Trainers for Training Institutions
2. Journals/publications/magazine
3. 5S / Visual Workplace Handbook of Brady

HORTICULTURAL CROPS PRODUCTION

LEVEL I

Learning Guide 11

Unit of Competence: Apply 3S

Module Title: Applying 3S

LG Code: AGR HCP1 M03 LO5-LG011

TTLM Code: AGR HCP1TTLM031219v1

LO 5: Perform shine activities

Instruction Sheet	Learning Guide #11

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

- Preparing Plans to implement shine activities.
- Preparing and using Necessary tools and equipment for shinning activities.
- Using *Shine activity* to implementing appropriate procedures.
- Using Performance results are reported appropriate formats.
- Conducting regular shining 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 Plans to implement shine activities.
- Prepare and using Necessary tools and equipment for shinning activities.
- Use *Shine activity* to implementing appropriate procedures.
- Use Performance results are reported appropriate formats.
- Conduct regular shining activities

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions.
3. Read the information written in the “Information Sheets 1”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
4. Accomplish the “Self-check 1,2,3,4 and 5” **in page -.** 119,124,127,129 and 131
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-check 1).
6. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.
7. Do the lab test on page 32

Information Sheet-1	Preparing Plans to implement shine activities

1.1. Shine

With the clutter gone and the storage organized, the next step is to properly and thoroughly clean the work area every day. This step is critical as a way of sustaining the improvements begun in the Sort and Set phases. All storage areas, machines, equipment, tools and work surfaces must be cleaned and checked regularly. Employees will feel more comfortable in this clean and uncluttered environment, which could also lead to increased ownership of the organization's goals and vision.

Plan Shine Preparation:

1 **5S Management Techniques**

2 Identify what is necessary.

3 Define what and how to arrange.

4 Identify dirt sources.

5 Identify root causes.

6 Take action to eliminate dirt sources and root causes.

7 Who is responsible?

8 What actions to take to maintain the desired condition?

9 When must those actions be taken?

10 Where must they apply?

11 What procedures need to be followed?

12 Develop 5S practices into a HABIT.

13 Compare actual goals with set goals.

14 Reward and recognize efforts of staff.

Register 5S Certification.

Participate in National 5S Competitions.

Review Plan-Do-Check-Act Cycle.

To ensure successful 5S Implementation, each phase must proceed accordingly as illustrated in the ROADMAP TO 5S IMPLEMENTATION.

Everyone understands, obeys and practices the rules and procedures

Continual efforts at sustaining the desired condition

Cleaning of the pavers

Using washing-up liquid or an acid-free soap is based on floor cleaning product. The soapy water is swilled onto the surface of the paving and then brushed with a bristle brush to loosen the surface detritus. Loosened dirt is washed off with clean water. Also by diluting calciferous stone detergent with water in a ratio of 1:5 and apply generously with a sponge; using a long-handled squeegee for larger areas.

Then by scrubbing away at dirty ingrained and grease, allowed to work for 10-20 minutes and wiping away the dirty cleaner by rinsing with a mop and a bucket of clean water. Once it dry, the tiles need to be checked to reseal by leaving a few drops of water on the surface. If

Fig 1.1 Cleaning of paver

water soaks in, the floor needs an application of impregnator.

Excess solution is removed after 15 minutes of application any impregnator remaining on the surface of the floor tiles and not allowed to dry on to the surface. So it removed with a squeegee and clean cloth of tatty cotton T-shirt.

Until the surface is dry walking over it is not allowed. This depends on temperature of the areas but after 1-2hours it should be safe to walk on in socks.

Self-Check -1	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Keeping tools properly storing, cleaning, and maintaining is **not** saves time and money **(5 points)**

   A True B. false

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-2	Preparing and using Necessary tools and equipment for shinning activities

3.1 Preparing Tools and Equipment for maintenance and set in order

Keeping tools properly storing, cleaning, and maintaining will save time and money. In order to keep tools in good working condition during storage, there are some basic preparatory steps that should be taken. It is important to follow the cleaning and storage instructions, especially for larger power tools such as power saws or plate compactor.

3.1.1 Maintenance of equipment's

i. Maintenance of Block/brick/tile saw

- Changing worn blade
- Changing deformed gasket
- Operating frequently
- Changing oil monthly
- Greasing rotating or vibratory parts
- Regular Lubrication
- replacement of worn parts

ii. Maintenance of Plate compactor

iii. Engine maintenance

- Changing engine oil
- Changing fuel filters regularly and always use clean fuel.
- Tighten all hardware, including ramming shoe hardware, engine cylinder screws, and any external hardware.
- Clean air cleaner cover.
- Clean out engine cooling fins with an air compressor.
- Clean and check spark plug gap.
- Clean all filters.
- Replace the spark plugs.
- Replace fuel and oil lines every two years regardless of visible wear.

Fig 3.1 Maintenance of plate compactor

iv. Maintenance of Grinder

- lubricating with cleaned oil
- Replacing of worn parts of grinding machine.
- Cleaning dusts and other materials
- Changing worn blade

3.1.2 Setting tools and equipment's

➢ **Storing method of different equipment's**

i. Setting of Block/Brick/Tile Saw

- Store the saw in preferably in mounting brackets or its metal box.
- Storing the saw in dry place

ii. Setting of Grinder

- Store the saw in preferably in mounting brackets or its metal box.
- Storing the saw in dry place

Fig 3.4 Storing of tools

iii. Storage of plate compactor

- Store the plate compactor on dry places

Fig 3.3 storing of plate compactor

➢ **Setting of tools**

How to Prepare and Set Tools

1. To keep tools tidy, it should be cleaned after use and wiped down with a rag or towel to be sure that they are free of dirt, grease and debris and put in proper manner.
2. After cleaning, damage or defects should be checked. If the tool cannot be repaired, it should be thrown to away.
3. Any soil and dirt should be scraped away from the metal surfaces with an approved solution. Before placing in storage it should be dried with a towel or rag.
4. The metal parts of the tools should be coated with a lubricant protector spray.
5. Tools is does not directly stored on the ground both small hand and power tools should be Placed on shelving.

Fig 3.4 Tools Storing board

Conducting regular activities of shining means to sustain and improve an activities in your work shop by making set up of action to regulate in the work place

The Way of conducting regular activities makes for the operation co-existence and well maintenance to the work shop; It could be maintained and conducting working area in order to improve the implementation activities of the kaizen

Self-Check -2	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Keeping tools properly storing, cleaning, and maintaining is **not** saves time and money **(5 points)**

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-3	Implementing shine activity.

3.1. SHINE

Shine activities should be taught as a set of steps and rules that employees learn to maintain with discipline.

Step 1: Determine shine target areas

Shine target areas are grouped in to three categories: warehouse item, equipments and space. *Warehouse items* include raw materials, procured subcontracted parts, parts made in-house, and assembly components, semi-finished and finished products. *Equipment* includes machines, welding tools, cutting tools, conveyance tools, general tools, measuring instruments, dies, wheels and casters, worktables, cabinets, desks, chairs and spare equipment. *Space* refers to floors, work areas, walkways, walls, pillars, ceilings, windows, shelves, closets, rooms and lights.

Step 2: Determine Shine Assignments

Workplace cleanliness is the responsibility of everyone who works there. Each employee should be assigned specific area to clean. To do this two methods can be used:

- A 5S Assignment Map – shows all the target areas for shine activity and who is responsible for cleaning them. By marking on 5S Map, the shine assignments can be shown.
- A 5S schedule – shows in detail who is responsible for cleaning which areas on which days and times of the day. Then this schedule should be posted in the work area.

Step 3: Determine shine methods

Shine activities should be a natural part of the daily work. Shine activities and inspection should be done before a shift starts, during work time and at the end of the shift.

Determining shine methods include:

- *Choosing targets and tools* – define what will be cleaned in each area and what supplies and equipments will be used.

- *Performing the five-minute shine* – cleaning should be practiced daily and should not require a lot of time.
- *Creating standards for shine procedures* – people need to know what procedures to follow in order to use their time efficiently. Otherwise, they are likely to spend most of their time getting ready to clean.

Step 4: prepare tools

The cleaning tools should be placed properly or set in order where they are easy to find, use and return.

Step 5: Start to shine

When implementing the shine procedures, consider the following suggestions:

- Be sure to sweep dirt from floor cracks, wall corners, and around pillars.
- Wipe off dust and dirt from walls, windows, and doors.
- Be thorough about cleaning dirt, scraps, oil, dust, rust, cutting shavings, sand, paint, and other foreign matter from all surfaces.
- Use cleaning detergents when sweeping is not enough to remove dirt.

3.2 Inspection

As discussed earlier, it is natural to do a certain amount of inspection while implementing shine activities. Once daily cleaning and periodic major cleanups become a habit, we can start incorporating systematic inspection procedures in to the shine procedures. Even when equipment in the workplace appears to function normally, it may be developing many problems. Always when machines or other equipment begin to show sign of minor, sporadic malfunctions, the operators

not the maintenance people notice it first. Therefore, it is important to consider the operators information about the equipment.

The following types of equipment problems frequently exist in factories:

1. Oil leaks from the equipment on to the floor.
2. Machines are so dirty that operators avoid touching them.
3. Gauge displays and other indicators are too dirty to be read.
4. Nuts and bolts are either loose or missing.

5. Motors overheat.
6. Sparks flare from power cords.
7. V-belts are loose or broken.
8. Some machines make strange noises.

Self-Check -3	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Write steps of shining? **(5 points)**

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-4	Reporting performance results

Reporting quantitative and qualitative results gained by implementing the 3rd S – Shine using the following formats. All or some of the improvement indicators can be used.

Quantitative Results

Record tangible/quantitative results and changes that are achieved by applying shine activity using the following indicators.

Using Performance results are reported appropriate formats.

Regular Cleaning Assignment Sheet

Worksite			Group						5S promoter			
No.	Day	Target place/object	Person in charge						Frequency	Time	Start	Tool
			A	B	C	D	E	F				
1	Mon											
2												
3												
4	Tue											
5												
6												
7	Wed											
8												
9												
10	Thu											
11												
12												
13	Fri											
14												
15												

Self-Check -4	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Discuss on quantitative and qualitative results **(3 points)**
2. ----------is the process of using goods or products again.

1. ---------- is the process of removing dirty things from the pavers after the completion of paving. **(3 points)**

   A. Cleaning or sweeping
   B. Mortaring
   C. Grouting

Note: **Satisfactory rating - 6 points** **Unsatisfactory - below 6 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet-5	Conducting regular shining activities

Shine activities can play an important part in bringing work efficiency and safety. Cleanliness is also linked with the morale of employees and their awareness of improvements. Factories or workshops that do not implement the shine pillar suffer the following types of problems:

1. Poor morale and inefficiency at work. This could be due to dirty windows that can pass only little light.
2. Unable to see or find defects in dark and messy workplaces.
3. Slipping and injuries can be created due to puddles of oil and water on the floor.
4. Frequent breakdown of machines due to insufficient check-ups and maintenances which in turn leads to late deliveries.
5. Low and unsafe operating machines due to insufficient checkups and maintenance which in turn leads to hazard and accidents.
6. Defects will result due to shaving cuts getting mixed in to production or assembly processes.
7. Shaving cuts can get in to people's eyes and create injuries.
8. Low morale due to filthy work environments.

Self-Check 5	Written Test

***Instructions**:* Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers. Write your answers in the sheet provided in the next page.

1. List problems that occur when do not implement the shine activity? (4 points)
2. What is the important of shining?(6 points)

Note: **Satisfactory rating – 10 points** **Unsatisfactory - below 10 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Operation Sheet 5	Implementing shine activity.

Objectives: To apply the first pillar of 3s Techniques for cleaning the house:

Procedures

Step 1- wear PPE.

Step 2- select required tools and materials

Steps 3- select your material based on their size

Steps 4- put each material together based on their group

Step 5- avoid unnecessary materials

Step 7- use necessary materials

LAP Test 5	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

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

Task 1: prepare a plan for s Implementing shine activity in your workshop.

Task 2: Following the steps for using 3S Map, draw before and after map/ layout of your work shop.

Task 3: Following the procedures of Implementing shine activity in the assigned workshop.

List of Reference Materials

1. 5S Training of Trainers for Training Institutions
2. Journals/publications/magazine
3. 5S / Visual Workplace Handbook of Brady

NO	TTLM developer Name	Back ground Qualification	College Address	College Name	Cell Phone	E-mail
1	Deribow Gonfa	Plant science(Bsc)	Oromiya	Fitche PollyTVET	0912774688	gonfad24@gmail.com
2	Tesfaye Tekola	Agronomy (Msc)	Benishangul Gumuz	Assosa ATVET	0910550651	tttekola@gmail.com
3	Berhanu Mammo	Horticulture (BSc)	Mizan ATVET	Federal	0912676883	birehanmammo@gmail.com
4	Haftu Mehari	Plant science(BSc)	Tigray	Maichew ATVET	0914312311	Kalabkalab61@gmail.com
5	Melaku Bawoke	Agronomy (Msc)	Federal	Gewane	0920258287	Melakubawoke10@gmail.com
6	Tadesse Yasin	Horticulture (BSc)	Amhara	Kombolcha PollyTVET	0921626541	-
7	Zewde Paulos	Agronomy(Msc)	SNNPR	Sodo ATVET	0921004814	Zedpa2013@gmail.com
8	Bekele Belete	Agronomy (Msc)	SNNPR	Sodo ATVET	0916379025	Bekelebelete6@gmail.com
9	Fetene Muluken	Agronomy (Msc)	Amhara	Woreta ATVET	0986911690	Fetenemuluken9@gmail.com
10	Misgana Belay	Agronomy (Msc)	Oromia	Nedjo ATVET	0911983854	Misbel2000@gmail.com
11	Sadik Ebrahim	Agronomy (Msc)	Federal	Agarfa ATVET	0920617776	sadikebra@gmail.com
12	Birhanu reda	Horticulture(BSc)	Tigray	Maichew ATVET	0923452395	birhanureda@gmail.com

Profile of trainers participate on special Horticultural Crop Production TTLM development for level I at Adama 2019