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# Continuous Improvement Toolkit

**5S**

## Managing Risk

PDPC  
FMEA RAID Logs  
Fault Tree Analysis  
Risk Assessment\*  
Traffic Light Assessment

## Deciding & Selecting

Pros and Cons  
Break-even Analysis  
Force Field Analysis  
Decision Tree  
QFD  
Kano Analysis  
Critical-to Tree  
Cause & Effect Matrix  
Confidence Intervals  
Probability Distributions  
Graphical Analysis  
Run Charts  
Control Charts  
Sampling  
Brainstorming  
Nominal Group Technique  
Affinity Diagram  
Lateral Thinking

## Planning & Project Management\*

Importance-Urgency Mapping  
Cost -Benefit Analysis  
Voting  
TPN Analysis  
Prioritization Matrix  
Paired Comparison  
Pareto Analysis  
ANOVA  
Hypothesis Testing  
Scatter Plot  
Correlation  
5 Whys  
Fishbone Diagram  
TRIZ\*\*\*  
SCAMPER\*\*\*  
Mind Mapping\*  
Attribute Analysis  
Visioning

Lean Measures  
OEE  
MSA  
Cost of Quality  
Reliability Analysis

## Understanding Performance

Focus groups  
Photography  
Measles Charts  
Data Collection  
Critical Incident Technique  
Observations

## Understanding Cause & Effect

Design of Experiments  
Regression  
Multi-Vari Charts  
Relations Mapping\*

## Identifying & Implementing Solutions\*\*\*

Simulation  
TPM  
Mistake Proofing  
Pull Systems  
JIT  
Ergonomics  
Work Balancing  
Automation  
Bottleneck Analysis  
Visual Management  
Flow  
Value Analysis  
5S  
Wastes Analysis  
SMED  
Time Value Map  
Process Redesign

## Creating Ideas\*\*

## Designing & Analyzing Processes

IDEF0  
Value Stream Mapping  
SIPOC  
Flow Process Chart  
Process Mapping  
Flowcharting  
Service Blueprints

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### What problems do you commonly encounter at workplace?

- ❑ Disordered and cluttered environment.
- ❑ Mistakes and errors.
- ❑ High absenteeism.
- ❑ Demotivated employees.
  
- ❑ What else ...



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## □ 5S is:

- A problem solving technique.
- A productivity, quality and safety enhancement technique.

## □ 5S involves activities designed to create and maintain a disciplined workplace.

- Helps create a better working environment and a consistently high quality process.
- Simplifies work environment, reduces waste while improving quality, efficiency and safety.

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## History:

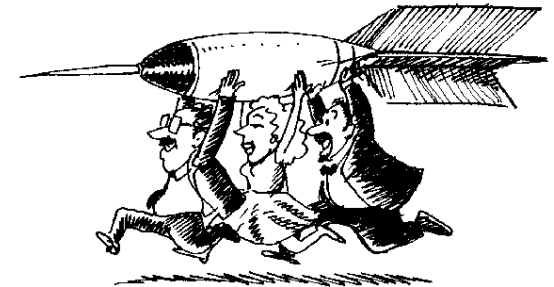
- ❑ 5S was created by Toyota as a part of their lean manufacturing system.
- ❑ Many years ago, researchers started studying the secret of success of Japanese manufacturing companies.
- ❑ 5S turned out to be one the most impressive secrets.
- ❑ The factories were so well organized and equipment were so clean and well maintained that any problem such as leaking oil could be easily seen.

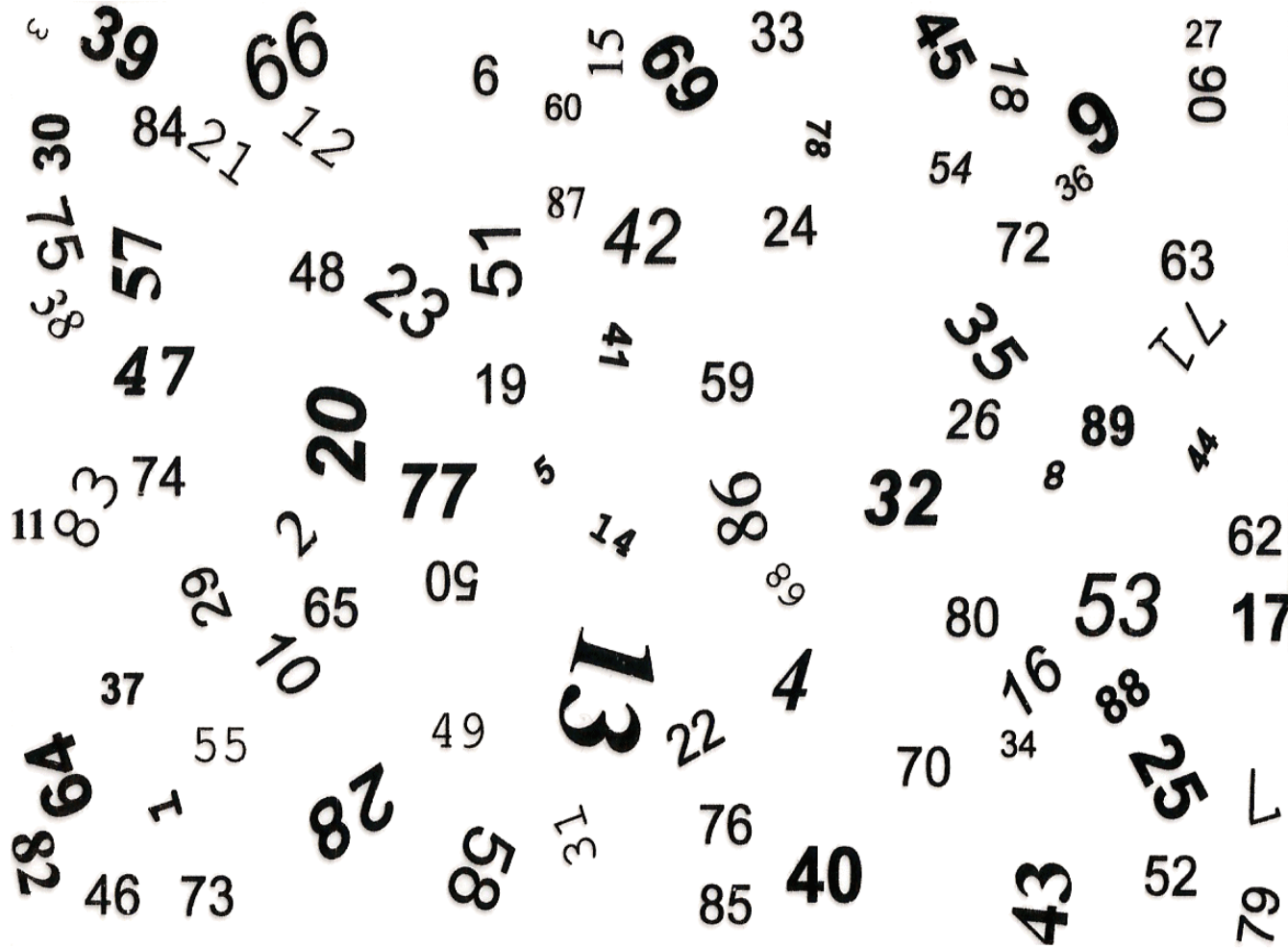


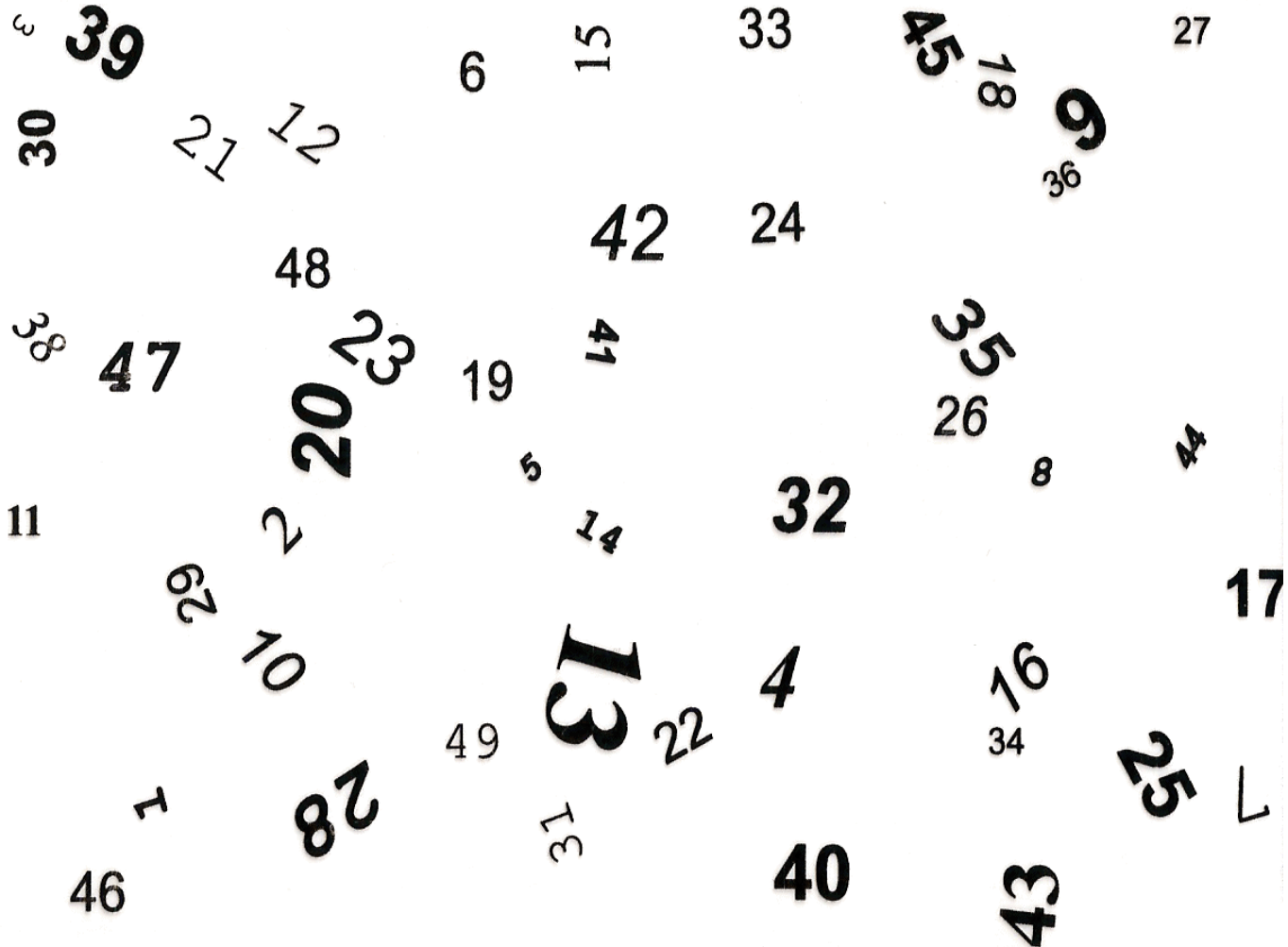
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## Workshop Objectives:

- ❑ Understand the needs for implementing 5S in the plant.
- ❑ Understand the 5S principles.
- ❑ Generate improvement ideas.
- ❑ Create an action plan.
- ❑ Implement the improvement ideas.
- ❑ Improve the workforce area.

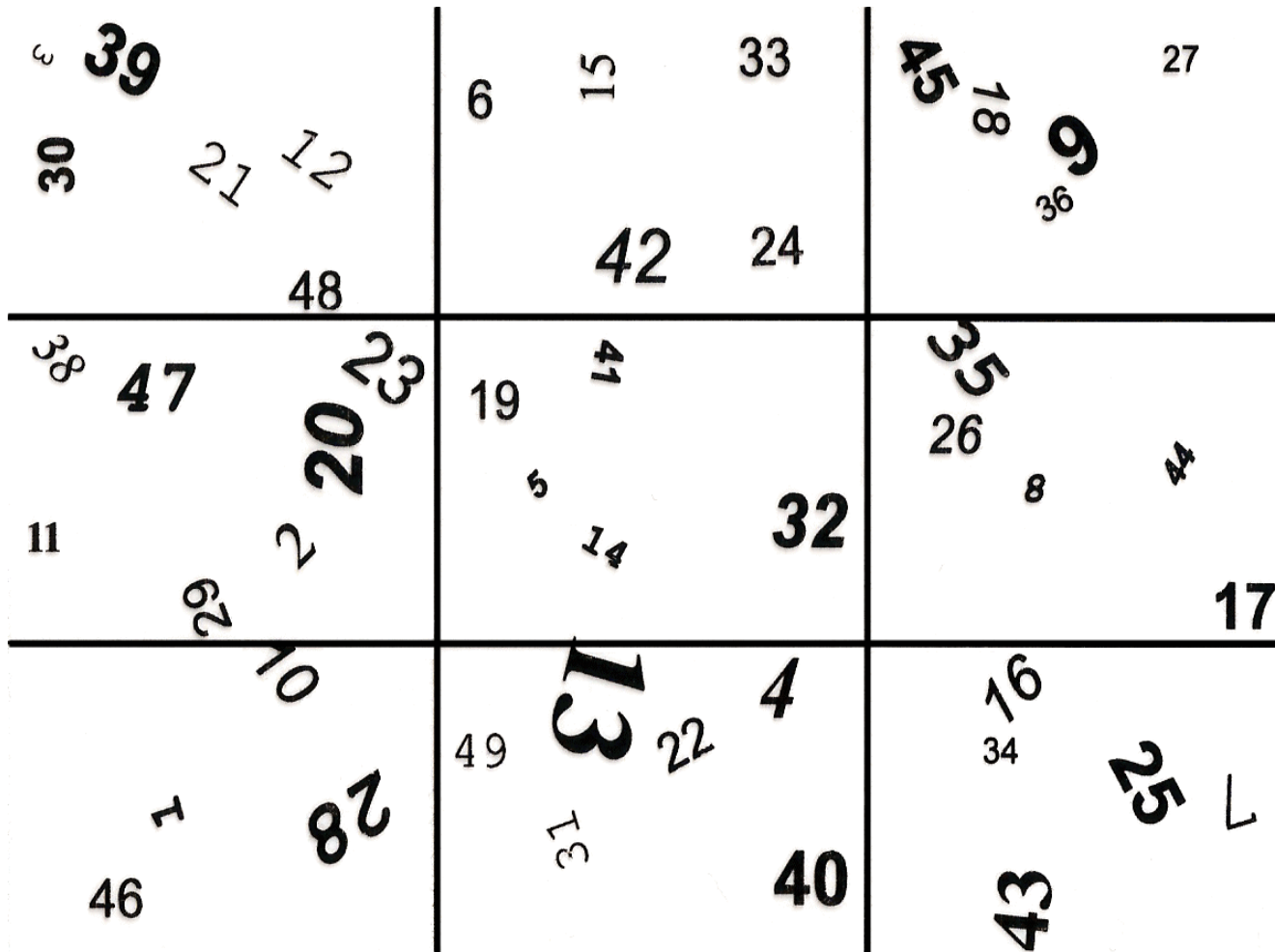








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1	2	3	<b>4</b>	5	6	7	8	<b>9</b>
10	11	12	<b>13</b>	14	15	16	<b>17</b>	
19	<b>20</b>	21	22	23	24	<b>25</b>	26	27
<b>28</b>	29	<b>30</b>	31	<b>32</b>	33	34	<b>35</b>	36
37	38	<b>39</b>	<b>40</b>		42	<b>43</b>	44	<b>45</b>
46	<b>47</b>	48	49					

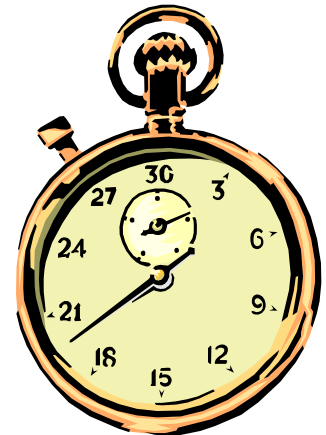
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	_0	_1	_2	_3	_4	_5	_6	_7	_8	_9
0_		1	2	3	<b>4</b>	5	6	7	8	<b>9</b>
1_	<b>10</b>	11	12	<b>13</b>	14	15	<b>16</b>	<b>17</b>	18	19
2_	<b>20</b>	21	22	<b>23</b>	24	<b>25</b>	26	27	<b>28</b>	29
3_	<b>30</b>	31	<b>32</b>	33	34	<b>35</b>	36	<b>37</b>	38	<b>39</b>
4_	<b>40</b>	41	<b>42</b>	<b>43</b>	44	<b>45</b>	46	<b>47</b>	48	49

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## Benefits - Quick Retrieval and Time Saving

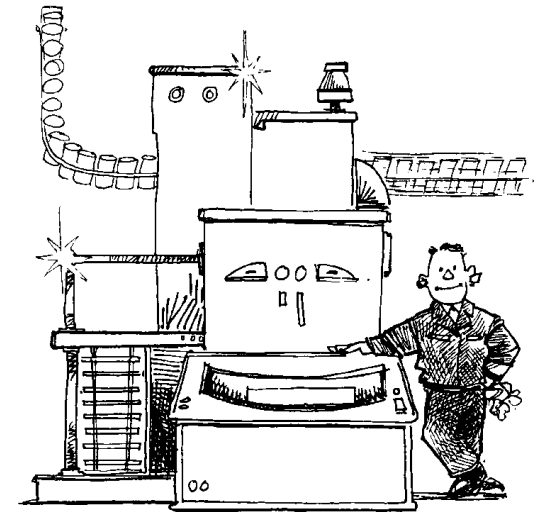
- If tools and materials are conveniently located in uncluttered work areas:
  - Operators spend less time looking for items.
  - This leads to higher workstation efficiency, a fundamental goal in mass production.



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## Benefits - Improves Visual Management:

- ❑ Creates an environment in which people are sensitive about even minor abnormalities and mistakes are obvious.
- ❑ Increases space.
- ❑ Place is easier to manage (smooth working).
- ❑ Accidents and mistakes minimized.



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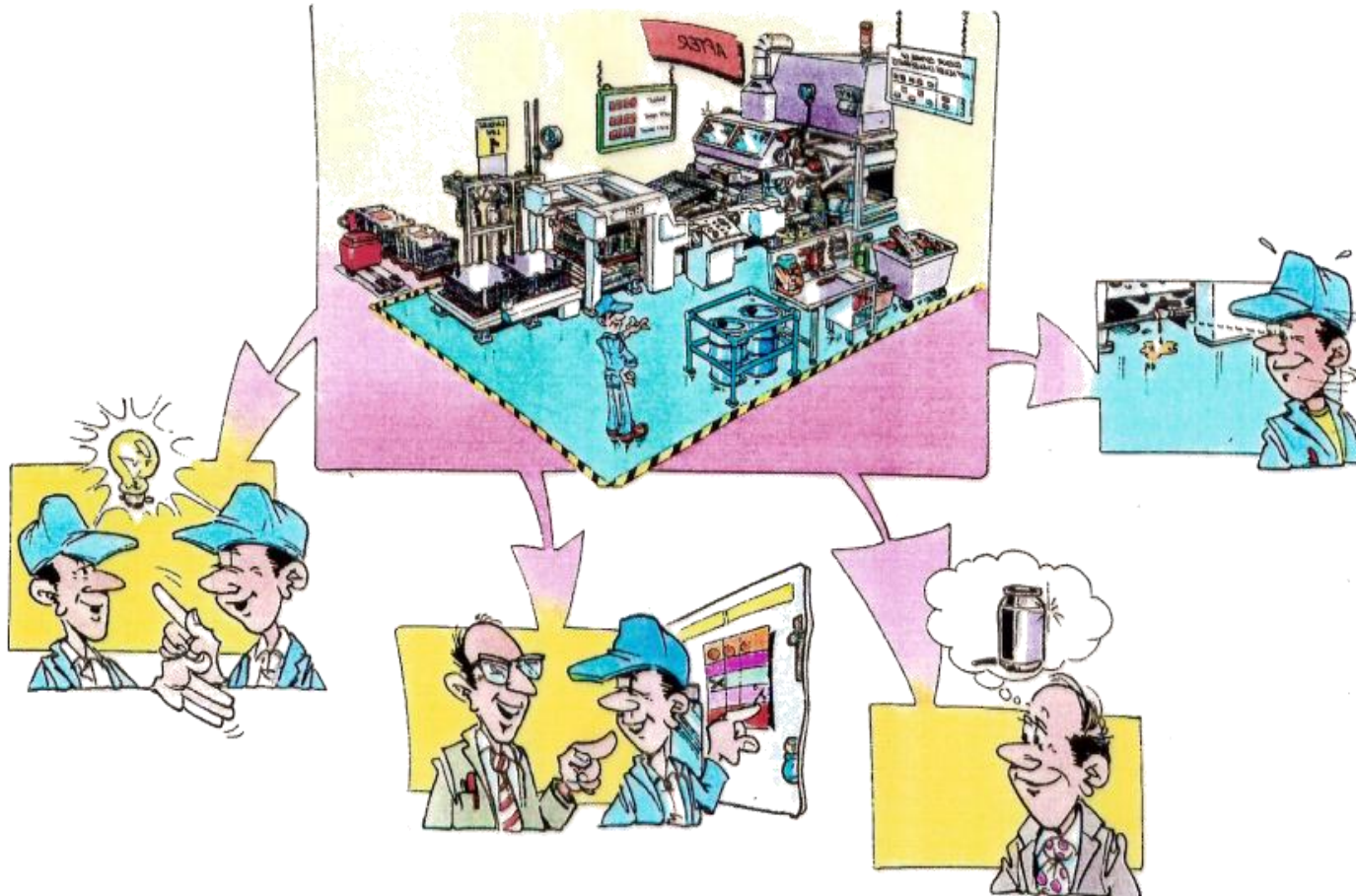
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### **Other Benefits:**

- ❑ A clean and tidy workplace leads to greater well being and increased motivation.
- ❑ Creates workplace ownership.
- ❑ Company image improves, as it can be expected that the standards displayed in the environment will be reflected in the product.

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## Benefits:



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## The 5S Principles

1. SEIRI Sort out
2. SEITON Set in order
3. SEISO Shining/Cleaning
4. SEIKETSU Standardize
5. SHITSUKE Sustain/Discipline



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## 1. Sort Out (SEIRI):

- ❑ Define what is necessary to perform the work, then remove it.
- ❑ Sort first to concentrate on what will remain in the workplace.
- ❑ Remove items which are broken, unusable or only occasionally used.
- ❑ This will provide means eliminating unrequired items.
- ❑ For more effective use of time and space.

“Remove what is not required”



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## What to Sort Out?

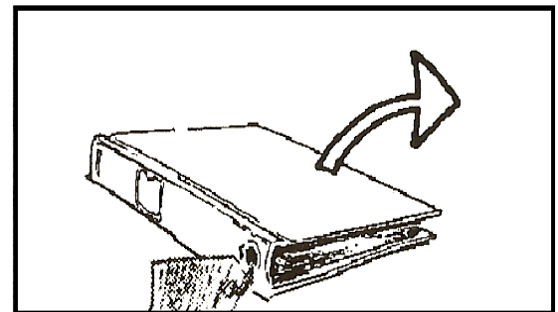
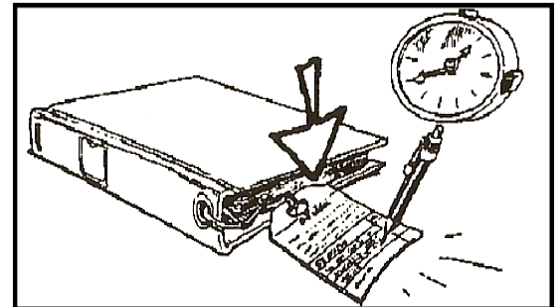
- ❑ Materials.
- ❑ Equipment and tools.
- ❑ Machines and spare parts.
- ❑ Measuring instruments.
- ❑ Products.
- ❑ Desks, books and papers.
- ❑ Clothes.
- ❑ Cleaning tools and materials.



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## Red Tag Technique:

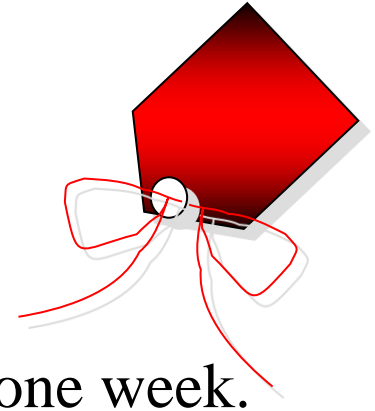
- ❑ An effective visual method to identify unneeded items.
- ❑ A red tag is placed on all items not required.
- ❑ These items are then moved to a central holding area.



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## Red Tag Approach:

- ❑ Decide what you need.
- ❑ Give team members red labels and ask them to go through every item in the workplace.
- ❑ Not needed? red tag it.
- ❑ Place the suspected items in the red tag area for one week.
- ❑ Allow team members to reevaluate the needed items.
- ❑ Need items should be returned back.
- ❑ Occasionally used items are moved to a more organized storage location outside of the work area while unneeded items are discarded.



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## Red Tag Example:

RED TAG		RED TAG	
<b>General Information:</b> Date: _____ Tagged by: _____ Item name: _____ Location: _____		<b>Action to Take:</b> <input type="checkbox"/> Return to _____ <input type="checkbox"/> Discard <input type="checkbox"/> Move to the Red Tag storage area _____ <input type="checkbox"/> Move to the storage site _____ <input type="checkbox"/> Other _____	
<b>Category:</b> <input type="checkbox"/> Equipment <input type="checkbox"/> Machine parts <input type="checkbox"/> Tools and Jigs <input type="checkbox"/> Raw materials <input type="checkbox"/> Finished goods <input type="checkbox"/> Work-in-Process <input type="checkbox"/> Instruments <input type="checkbox"/> Stationary <input type="checkbox"/> Consumable materials <input type="checkbox"/> Other Other: _____		<b>Additional Comments:</b> _____ _____ _____ _____ _____ _____ _____	
<b>Reason for Red Tag:</b> <input type="checkbox"/> Not required <input type="checkbox"/> Defect <input type="checkbox"/> Aged / Obsolete <input type="checkbox"/> Scrap <input type="checkbox"/> Other Other: _____		Log No. _____	

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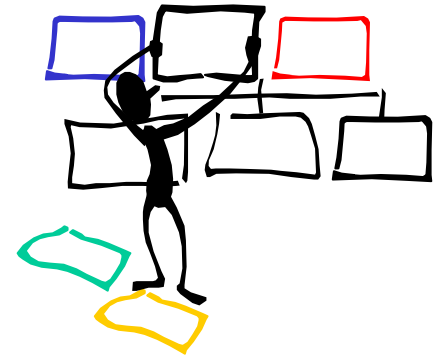
## Sort By Frequency of Use:

PRIORITY	FREQUENCY OF USE	HOW TO USE
<b>Low</b>	<ul style="list-style-type: none"><li>- Once per year or more.</li><li>- Less than once a year.</li></ul>	<ul style="list-style-type: none"><li>- Store away from workplace.</li><li>- Throw away (if not needed).</li></ul>
<b>Average</b>	<ul style="list-style-type: none"><li>- Once per month.</li><li>- Once per week.</li></ul>	<ul style="list-style-type: none"><li>- Store together but offline.</li></ul>
<b>High</b>	<ul style="list-style-type: none"><li>- Once Per Day.</li></ul>	<ul style="list-style-type: none"><li>- Locate at the workplace.</li></ul>

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## 2. Set in Order (SEITON):

- ❑ Define where and how the items to perform the job will be arranged.
- ❑ **Benefits:**
  - Increases effectiveness in the work area.
  - Items are easy found.
  - Improves safety and the work environment.
  - Makes visual management possible.



“Everything is needed needs a place”

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## Ask Yourself:

- ❑ What do I need to do my job?
- ❑ Where should I locate this item?
  - Floors.
  - Storage areas.
  - Shelves, racks and cabinets.
  - Disks and drawers.
  - Online/offline.
  - On walls and notice boards.
- ❑ How many do I need?

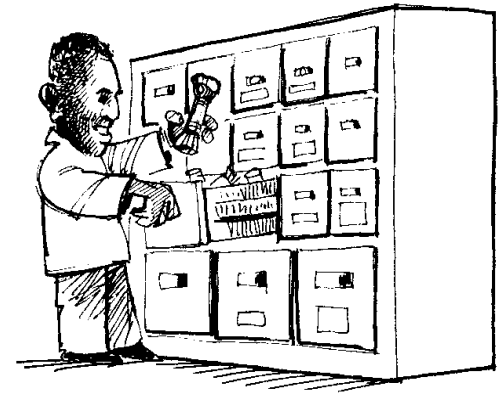




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## Strategies:

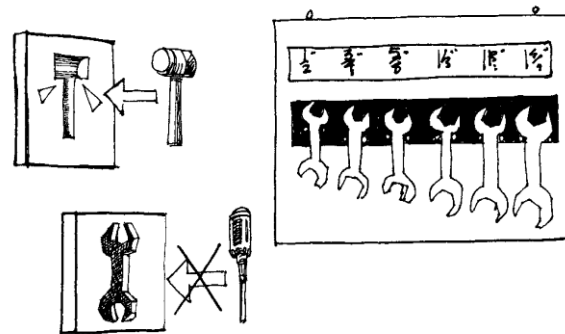
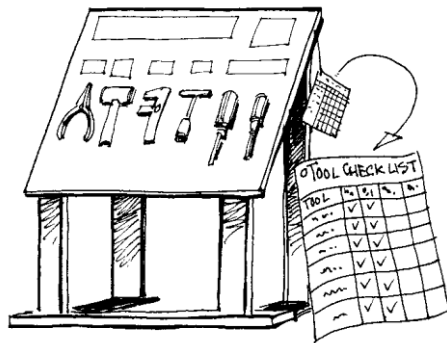
- ❑ Use modular shelving and cabinets.
- ❑ Mark positions of storage places clearly.
- ❑ Use tapes and labels.
- ❑ Outline work areas and locations.
- ❑ Indicate minimum and maximum level clearly to see exactly how many stock items are left at a glance.



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## Strategies:

- ❑ Classify and store tools by frequency of use.
- ❑ Use of tool checklist ensure all the proper tools are available.
- ❑ Use shadow boards.
- ❑ Ensure everything is available as it is needed and at the "point of use".



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## Strategies:

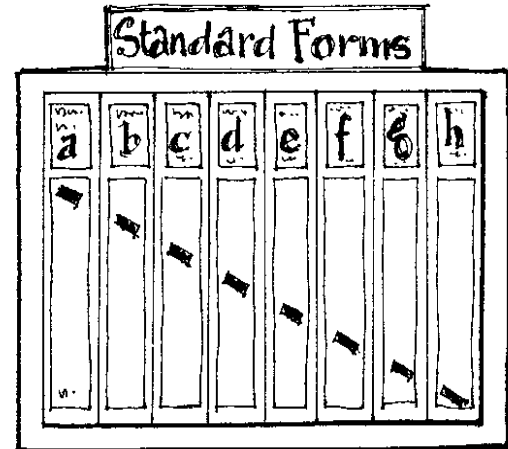
- ❑ Ensure safety equipment easily accessible.
  - ❑ Change from a closed to an open storage system.
  - ❑ Stack pallets correctly.
  - ❑ Paint floors, walls, machines and tools.
  - ❑ Ensure floors in good condition.
- 
- ❑ **Question: Some painting is often better done in later stages, why?**



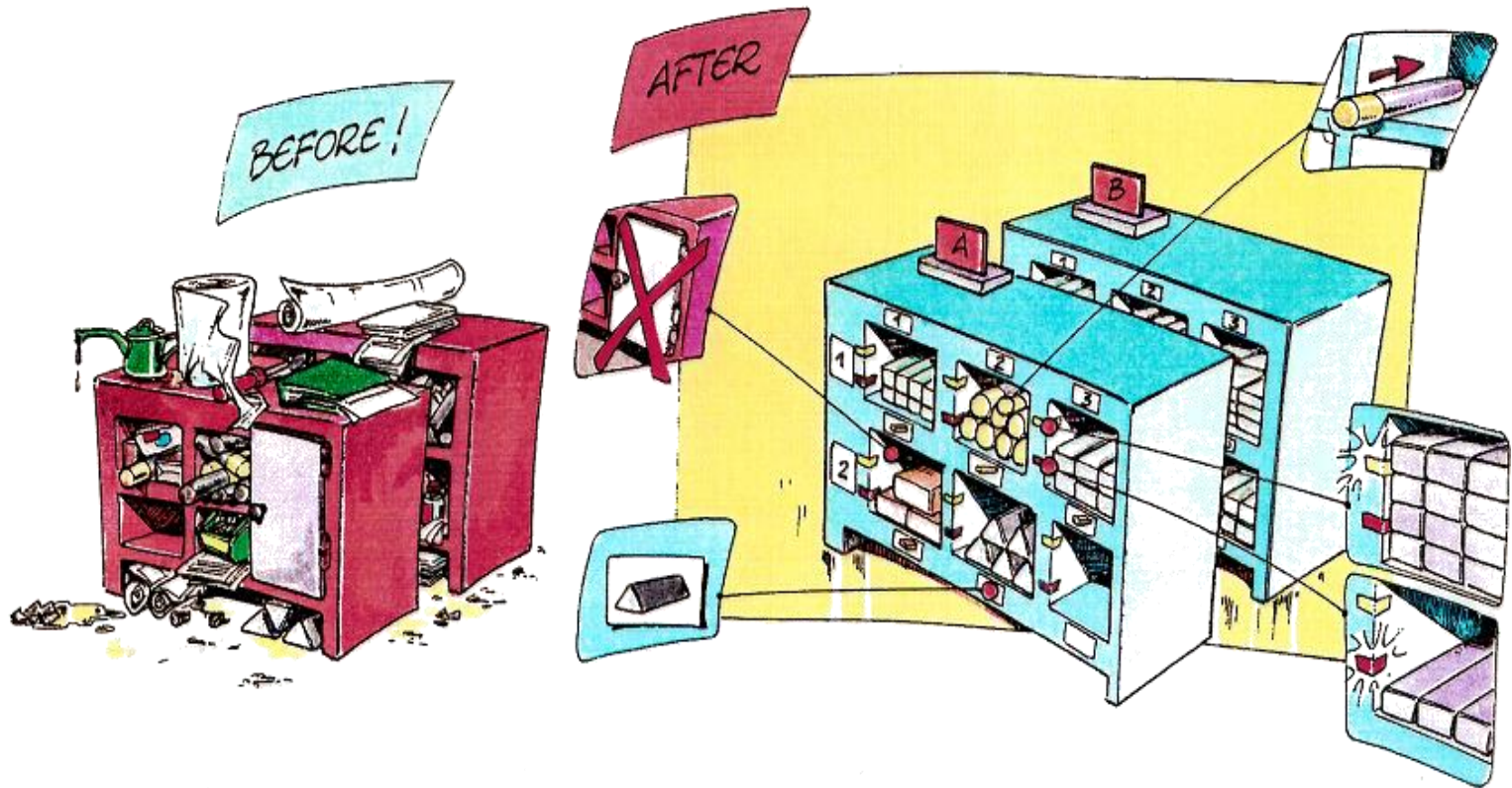
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## Strategies at Offices:

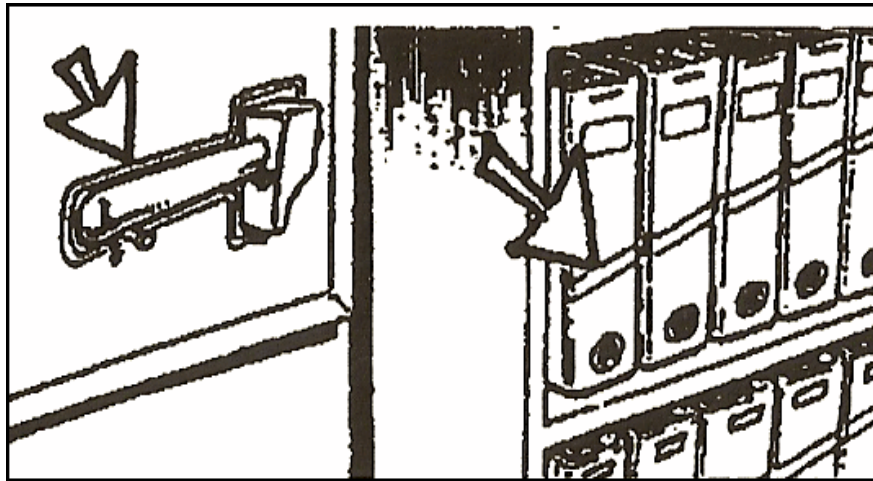
- ❑ Label of files and folders.
- ❑ Provide bookshelves for frequently used manuals, books and catalogs.
- ❑ Label the shelves and books so that they are easy to identify and return to their proper place.



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- 5S

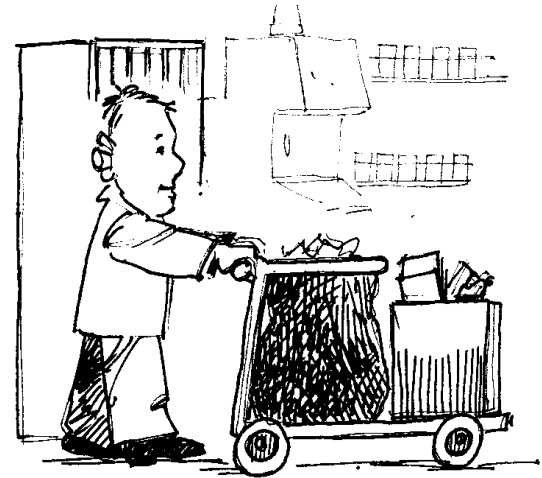


"A Place for Everything &  
Everything in its Place"

## - 5S

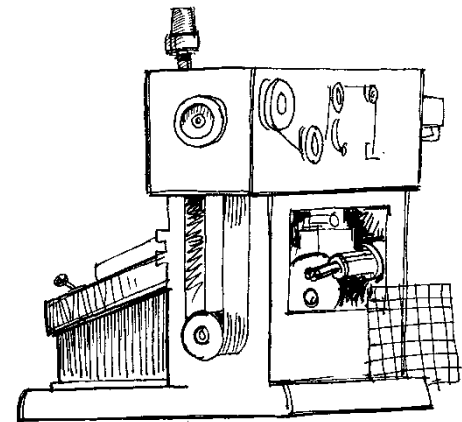
### 3. Shining/Cleaning (SEISO):

- ❑ Thoroughly clean the work area and daily follow-up cleaning.
  
- ❑ **Benefits:**
  - Helps discover abnormalities.
  - Improves environment into safer and more pleasant place to work.
  - Helps in creating ownership.



## - 5S

- After the implementation of shining:
  - Maintenance problems such as oil leaks can be identified before they cause problems.
  - Workers will also begin to notice changes in equipment and facility location such as air, oil and coolant leaks, repeat contamination, vibration, broken, fatigue, breakage, and misalignment.
  - These changes, if left unattended, could lead to equipment failure and loss of production.

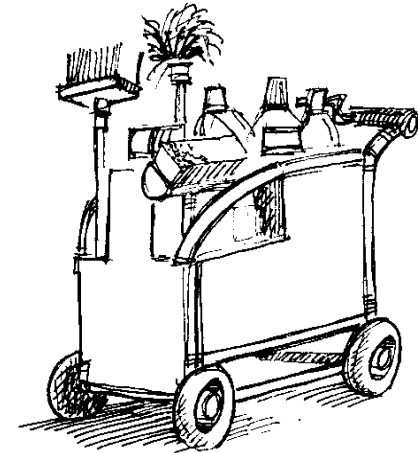




## - 5S

### Strategies:

- ❑ Machines and equipment should be cleaned by people who use them.
- ❑ Sweep, dust, polish and paint.
- ❑ Cleaning tools should always be easily accessible.
- ❑ Eliminate all spots.
- ❑ Identify and eliminate causes of dirt.

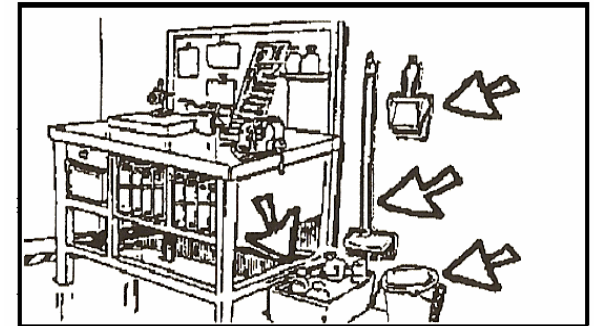


# - 5S

## Strategies:

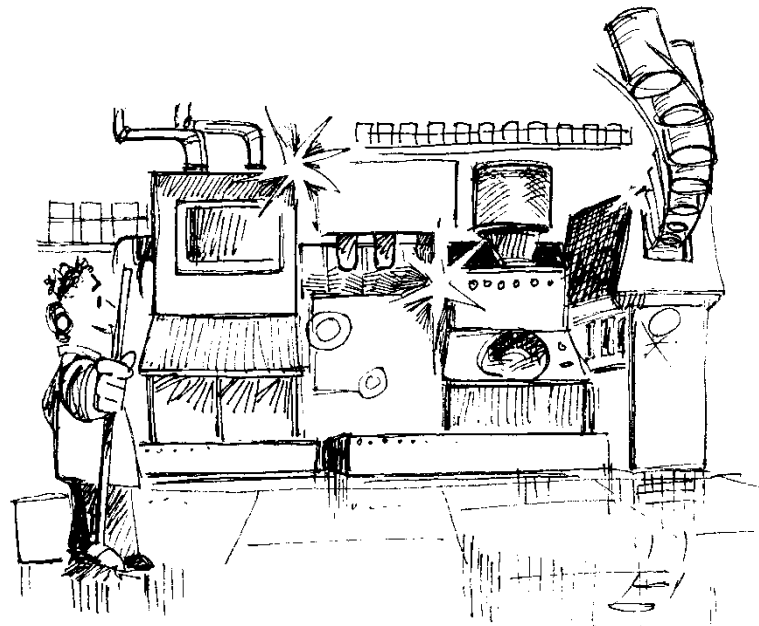
- ❑ Divide areas into zones and allocate people to take charge of each area.
- ❑ Establish a duty schedule and display it.
- ❑ Use cleaning inspection checklists.
- ❑ Identify a waste disposal area.

	MON	TUE	WED	THU	FRI
Zone 1					
Zone 2					
Zone 3					
Zone 4					



- 5S

No dirty machine or equipment  
can produce clean products



See workspace through customers eyes

- 5S



Before



After

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## 4. Standardize (SEIKETSU):

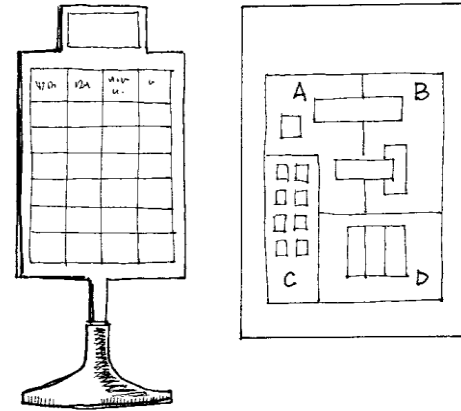
- ❑ Standardize means establishing procedures and best practices.
- ❑ The real challenge is to keep it tidy and clean.
- ❑ A clean and tidy workplace can only be maintained if a standard is established.
- ❑ Develop a work structure that will support the new practices and make them habits.
- ❑ As you learn more, update and modify the standards to make the process simpler and easier.



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## Strategies:

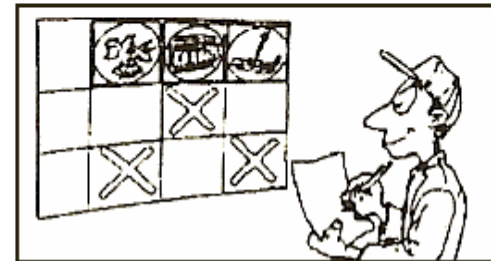
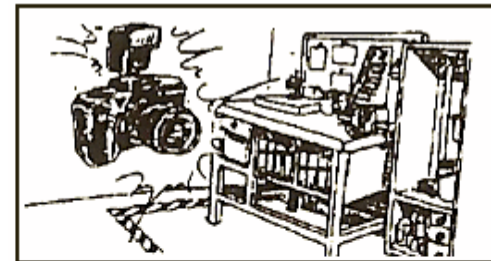
- ❑ Develop procedures, schedules and best practices.
- ❑ Include in the procedures the prevention for clutter.
- ❑ Allow the employees to participate in the development and the documentation of the standards.
- ❑ Regularly audit using checklists and measures of the 5S activities.
- ❑ Establish an information board which includes the results of the audits.



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## Strategy:

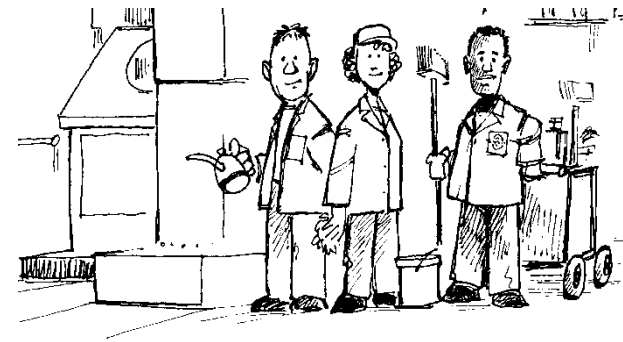
- ❑ Ensure everyone knows their responsibilities
  - When
  - Where
  - How
- ❑ Take photos to allow everybody to see at a glance if the present situation meets the standard.
- ❑ Provide feedback to the team on the good points and opportunities for improvement.



# - 5S

## 5. Sustain (SHITSUKE)

- ❑ This is by far the most difficult “S” to implement and achieve.
- ❑ Human nature will resist change and more than a few organizations have found themselves with a dirty cluttered areas few months following their attempt to implement 5S.
- ❑ Review and maintain what have been accomplished, and do not allow a gradual decline back to the old ways of operating.
- ❑ Have a formal system for monitoring results.
- ❑ Think of this step as sustaining the benefits you are getting from your 5S program.

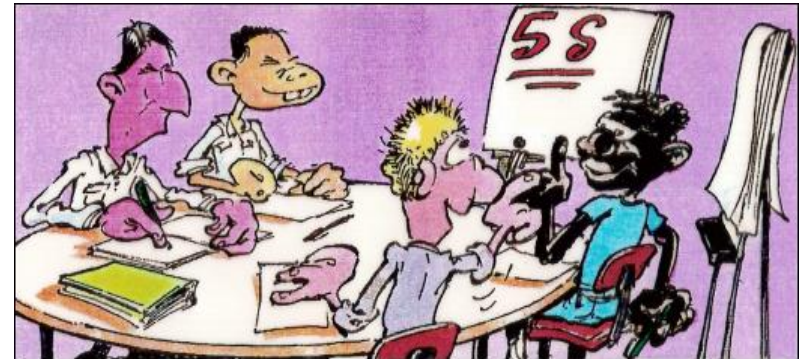




# - 5S

## Strategies:

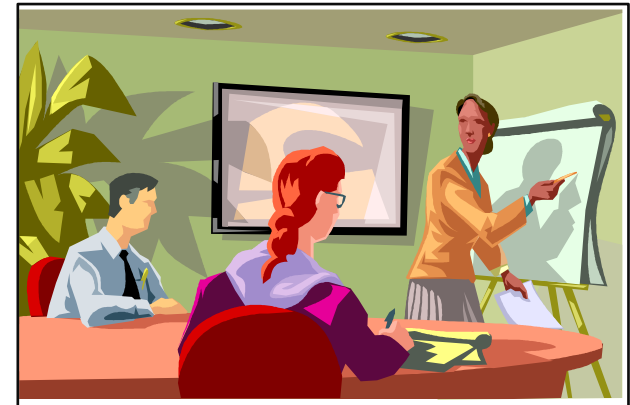
- ❑ Keep the processes going through training, communication and monitoring results.
- ❑ Enforce the Standards.
- ❑ Make it part of health and safety.
- ❑ Involve the whole workforce.
- ❑ Assign responsibilities.
- ❑ Get management support.
- ❑ Audit the process.
- ❑ Reward the Efforts.
- ❑ Make it a way of life.



# - 5S

## Strategies:

- ❑ Continue to educate people about maintaining standards.
- ❑ Make any needed changes in the standards and provide training that addresses those changes.
- ❑ Use 5S posters and signs:
  - 5S posters are used to remind employees of the proper procedures, and of the 5S benefits in general.
- ❑ Recognize and involve people via performance management system.
- ❑ Create a discipline to perform the S1 to S4 practices.



# - 5S

## **Before Implementation:**

- ❑ Set objectives and gain support.
- ❑ Define all areas.
- ❑ Select a specific areas for improvement.
- ❑ Establish 5S team (for the selected areas).
- ❑ Evaluate the current situation (photos and checklist).
- ❑ Establish a plan for the selected areas:
  - Activities
  - Responsibilities
  - Time frame
  - Costs

# - 5S

## Example – Selecting the Areas:

Area #	Area Name	5S needed?	5S Leader
13	Workshop	Yes	WS supervisor
14	Tool room	Yes	TR supervisor
15	Spare parts store	Yes	SP supervisor
16	Quality labs	No	
17	Canteen	Yes	Sara A.
18	Warehouse	Yes	WH supervisor
19	Finished good store	No	
20	Loading yard	Yes	K. Nader
21	Production office	Yes	Harvey
22	Purchasing office	Yes	Jamal T.
23	Front-end of line 1	Yes	Sami L.

# - 5S

## Example - Evaluation Checklist - Operation

Checklist Item	Guideline Criteria	(Y/N)
Parts and stock items	No unnecessary parts, stock and stored items left in the work place	
Machines and equipment	All machines and pieces of equipment are in regular use	
Jigs, tools and fixtures	All jigs, tools, fixtures and fittings are in regular use	
Other storage area	Storage area is defined to store broken, unusable or occasionally used items	
Standards for disposal	There are clear standards for eliminating unnecessary items	
Visual control	All unnecessary items can be distinguished at a glance	
Tools & equipment	Storage of tools & equipment is well organized for ease of take and return	
Stored items	Stored items are well organized	
Labeling	Labels exist to indicate locations, containers, boxes, shelves & stored items	
Quantity indicators	There are clear indications of maximum & minimum stock quantities	
Outlining / dividing lines	Dividing lines are all clean & all painted as per standard	
Safety	Safety equipment easily accessible	
Building structure	Floors, walls, ceilings & pipework are in good condition & free from dirt/dust	
Racks and cabinets	Racks and cabinets are kept clean and free from dirt or dust	
Machines, equipments & tools	Machines, equipment and tools are kept clean	
Stored items	Stored items are kept clean and free from dust	
Lighting	Lighting is enough and all lighting is free from dust	
Ventilation	Movement of air to limit the spread of viruses	
Pest control	Pest control exists and effective	
Cleaning tools	Cleaning tools are easily accessible	
Cleaning responsibilities	Cleaning assignments are defined	
Habitual cleaning	Maintaining cleanliness are considered everyone's responsibility	
The first 3 Steps	There are procedures for maintaining: Sort out, Set in order and Shining	
5S Documentation	5S checklists, routines, assignments are defined	
Responsibilities	Everyone knows his responsibilities, when and how	

## Example - Evaluation Checklist – Offices:

Checklist Item	Guideline Criteria	(Y/N)
Cabinets and shelves	No irrelevant reference materials, such as documents, drawings, etc.	
Desks & Drawers	No excess pieces of equipment or reference materials on drawers or desks	
Visual Control	Irrelevant items or documents can be identified at a glance	
Standards for disposal	There are clear standards for eliminating excess	
Exhibits	Displays are up-to-date, tidy and well-balanced	
Desks and shelves	Desks, tables & shelves are free of accumulations of papers & other objects	
Tools & equipment	Tools & equipment are well organized for ease of take and return	
Storage	Everything is stored in a fixed place	
Storage labels	Labeling of cabinets and equipment allows immediate identification	
Filing of documents	Docs are filed appropriately in accordance with Record Retention guidelines	
Display areas	The bulletin boards are free of clutter	
Safety	Safety equipment easily accessible	
Floor	The floor is kept clean and no signs of damage	
Building structure	Walls and ceilings are in good condition and free from dirt or dust	
Racks and cabinets	Racks and cabinets are kept clean and free from dirt or dust	
Equipments & tools	Equipment and tools are kept clean	
Other objects	Desks, Windowsills, ledges and the overall immediate area is kept clean	
Lighting	The angle and intensity of illumination are appropriate	
Ventilation	Movement of air to limit the spread of viruses	
Environment	The general environment is good, including color, air, lighting, etc.	
Cleaning responsibilities	Cleaning assignments are defined	
Habitual cleaning	Maintaining cleanliness are considered everyone's responsibility	
The first 3 Steps	There are procedures for maintaining: Sort out, Set in order and Shining	
5S Documentation	5S checklists, routines, assignments are defined	
Responsibilities	Everyone knows his responsibilities, when and how	

- 5S

## Example - Photos and Improvement Ideas:

Photos	Improvement Ideas



## - 5S

### **Example – Action Plan – Before Improvement:**

- ❑ Select a specific area for improvement.
- ❑ Select 5S leader.
- ❑ Select 5S team members.
- ❑ Ensure 5S leader and team members understand the objectives.
- ❑ Complete the project management worksheet.
- ❑ Take the "Before" photos.
- ❑ Complete the 5S checklist.
- ❑ Brainstorm to collect improvement ideas.
- ❑ **Fill action plan with activities for improvement.**
- ❑ Estimate financial requirements.
- ❑ Get Management approval/signature.



## - 5S

### **Example – Action Plan – After Improvement:**

- ❑ Take the "After" photos.
- ❑ Audit area using 5S checklist.
- ❑ Prepare control plan to sustain improvement.
- ❑ Assign responsibilities.
- ❑ Provide training if necessary.
- ❑ Report 5S outcomes (checklist, photos, control plan, new responsibilities, ...).
- ❑ Publish 5S outcomes on the 5S notice board.

## - 5S

### **By using 5S principles, We can gain:**

- ❑ Neat, clean, tidy, well organized workplace.
- ❑ Smooth working and No obstruction.
- ❑ Safety increases.
- ❑ Productivity improves.
- ❑ Wastage decreases.
- ❑ Quality improves.
- ❑ Employee, customer and management satisfaction increases.

# - 5S

## Example:



Before



After

# - 5S

## Example:



Before



After

- 5S

**Example:**



**Before**



**After**

- 5S

## 5S in Offices:

