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Immersive Education Program

5S In Lean Construction

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"LCI would like to acknowledge and thank David MacKay, Milestone Lean Consulting, Eric Lusis, Aecon, Lynx Lean Services and Annmarie Thurnquist, Jacobs for their leadership, work and collaboration to create this workshop. Learning opportunities like this exist because people like them engage to create them."

-Kristin Hill

LCI, Director Education Programs

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LCI Course:
5S in Construction
4 CEU

Sign the sign-in sheet for credit

AIA Approved Continuing Education

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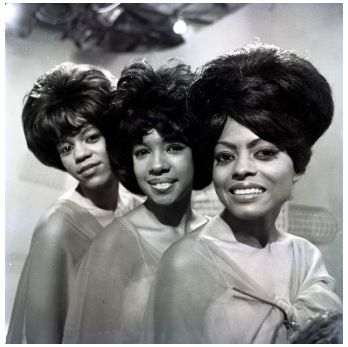
Introductions

- Name
- Company
- Role
- Favorite Motown Hit



The Supremes

The Temptations

The Isley Brothers

Gladys Knight & the Pips

The Four Tops

Stevie Wonder

The Drifters

The Commodores

The Jackson Five

Martha & The Vandellas

Learning Objectives

Understand and be able to identify the 5Ss supported by real project examples.

Understand how to implement key Lean approaches to support sustaining 5S on a jobsite.

Identify areas in your work that would benefit from 5S application.

Discover ways to build consensus and support for 5S with your team.

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Rules of Engagement

- This is a safe zone
- Everyone has equal status
- Speak up and share your ideas
- Actively listen to others
- One conversation at a time
- Use E.L.M.O.
- Silence phones
- Be focused and engaged
- Stay on time
- Have fun!

Lean Journey to Mastery

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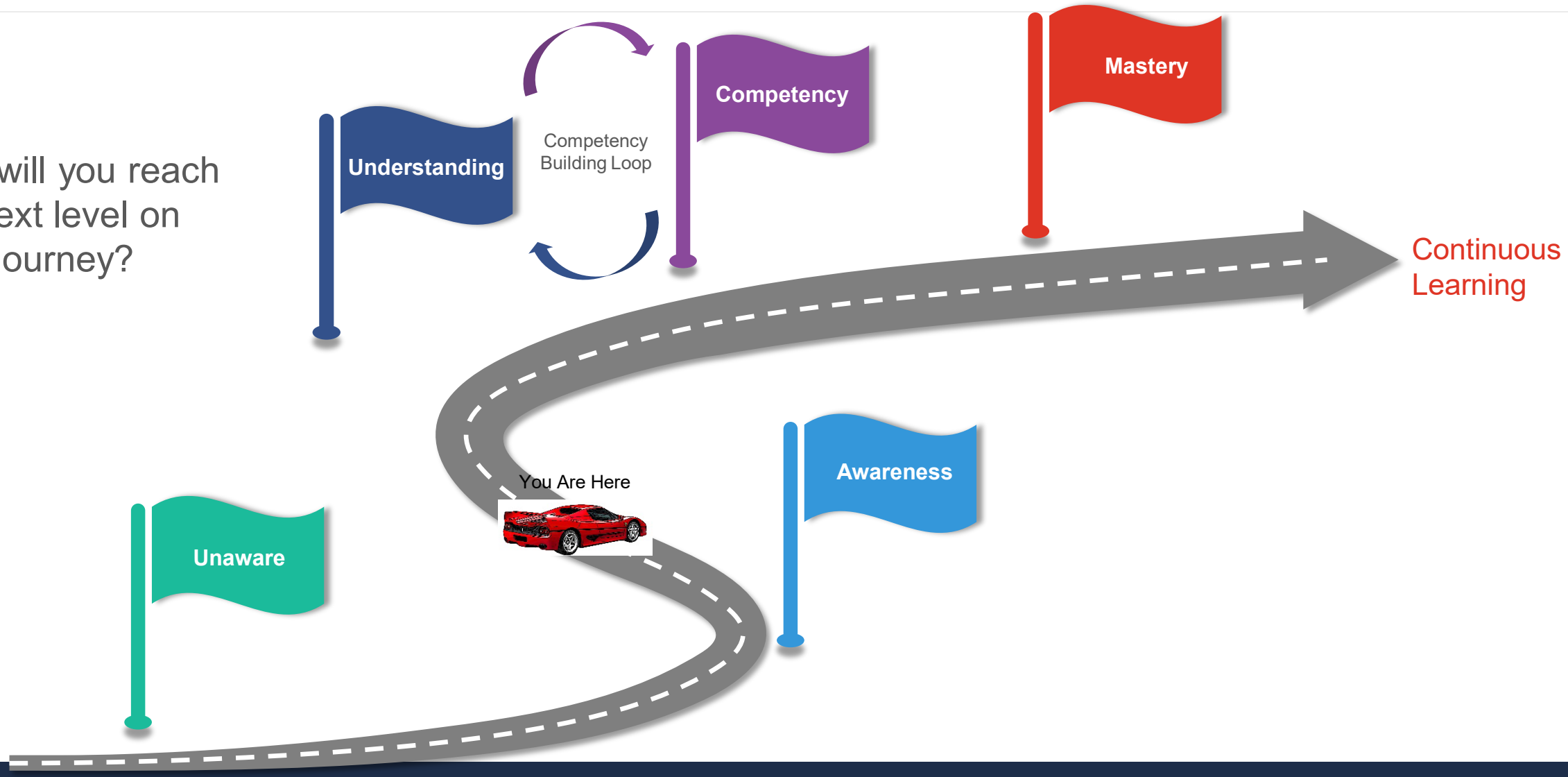
How will you reach the next level on your journey?



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Discussion Question

Why do our projects fall victim to the Friday cleanup?

What challenges do you have with the way our workplaces, materials, and equipment are organized on site?

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5S Program

Clean it up - Make it Visual

5S is a series of activities for eliminating wastes that contribute to errors, defects and injuries.

G

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5S is Foundational to Lean

5S helps to improve the efficiency of work flow by eliminating waste.

The goal of Lean is to build better, faster, safer, cheaper.

It may seem counterintuitive, but we don't get there by working harder or faster.

We do it by thinking Lean.

5S Makes Us Better

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Safety — A clean, organized site is a safer site.

Quality — A clean, organized workplace lets people focus on their work.

Productivity — A clean organized workplace supports more time getting things done and less time doing work arounds.

Schedule — A clean, organized workplace improves predictability.

5S in the Field Makes a Difference

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"Just little things like that… save you so much time. It is amazing."

Efron with KHS&S (Framing and Drywall)
Roberts Pavilion, Claremont McKenna Colleges (PCL)

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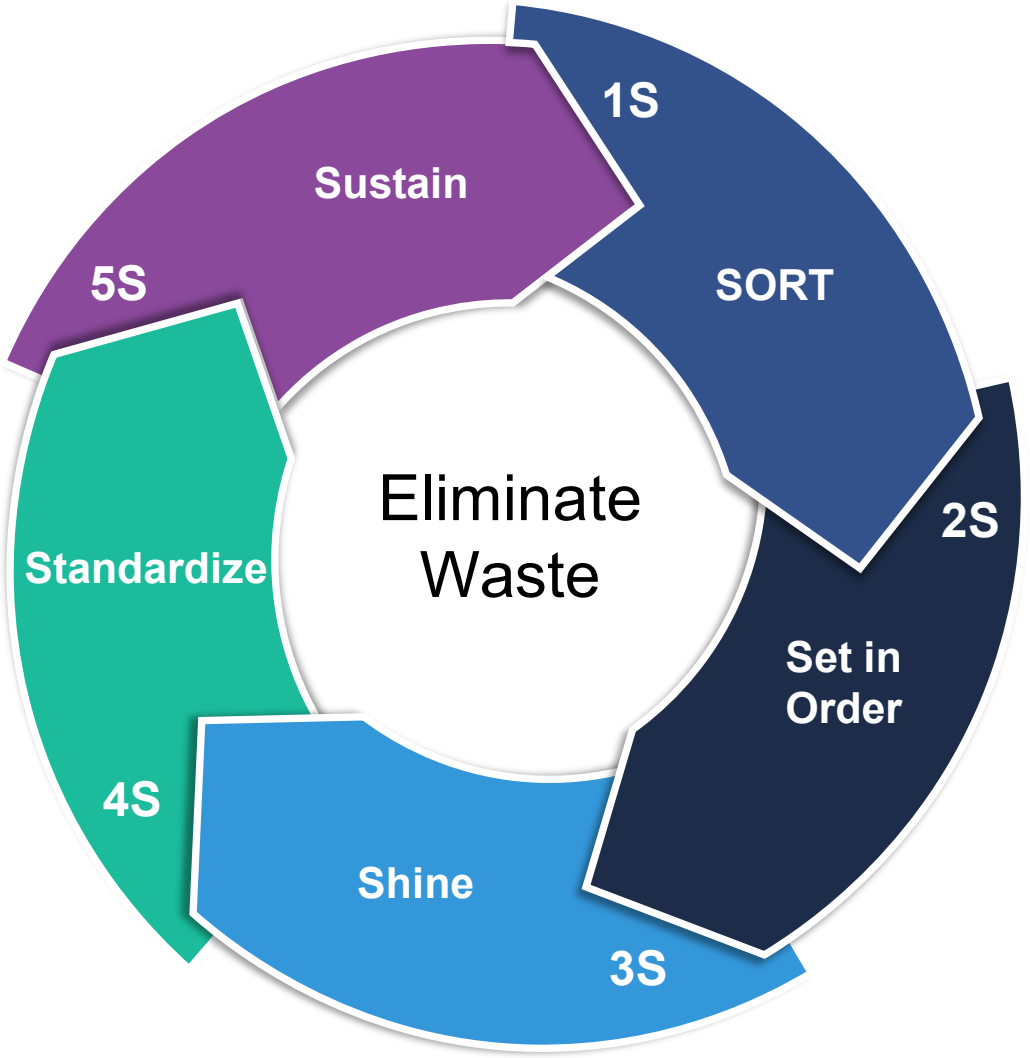
5S Numbers Game

Let's explore the impact of 5S!



5S Numbers Game – Round 1

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The following slides represent a worksite going through the 5S process. Your job, as a worker on the site, is to identify the numbers 1 through 49 in order on the screen during a 20-second shift.

Our first round is a project that has not yet started their 5S journey.

When I say "GO" start looking for numbers in order.

Please keep your sheets face down

Play – Round 1

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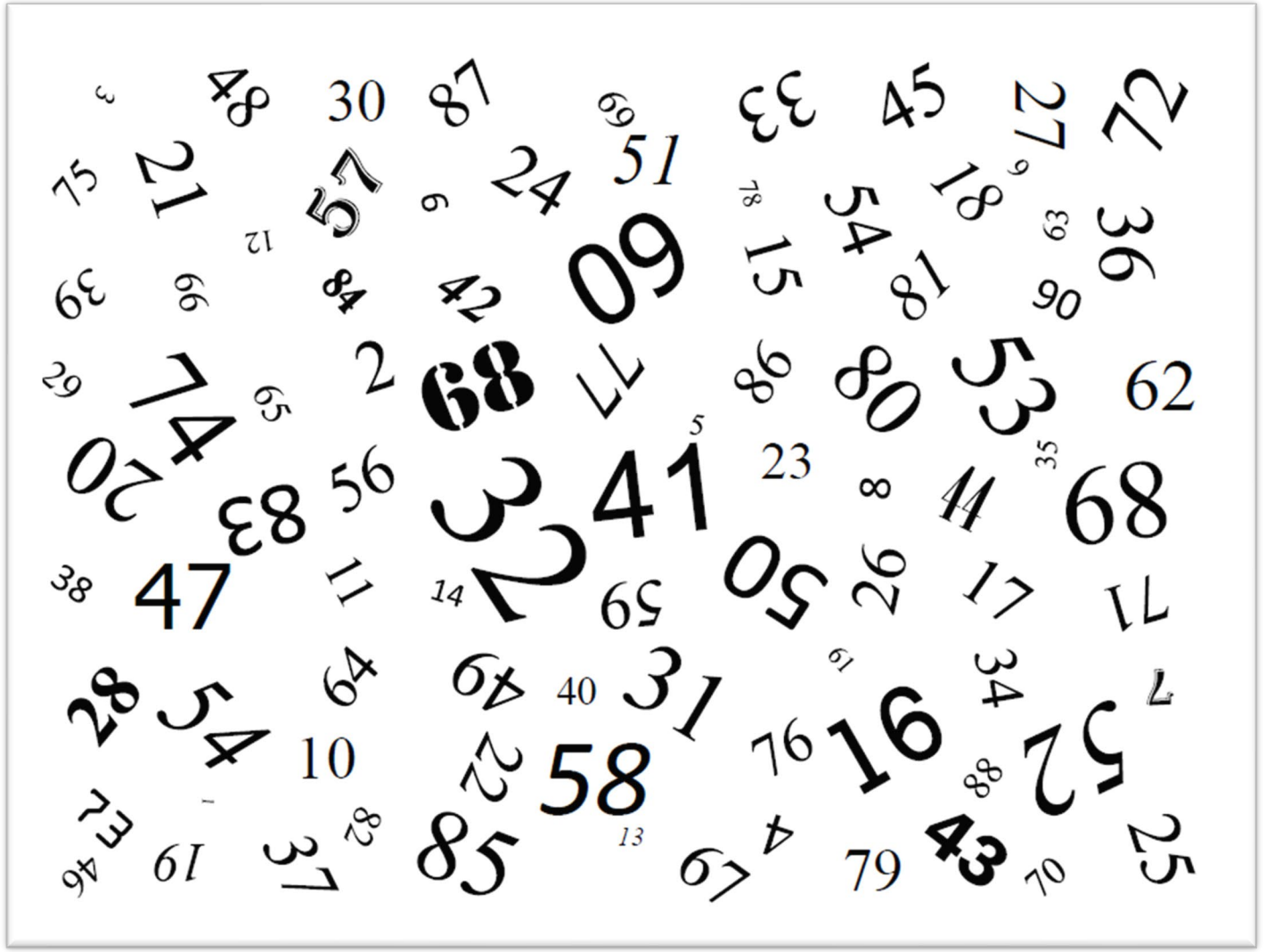
20

15

10

5

STOP!



5S Numbers Game – Round 2

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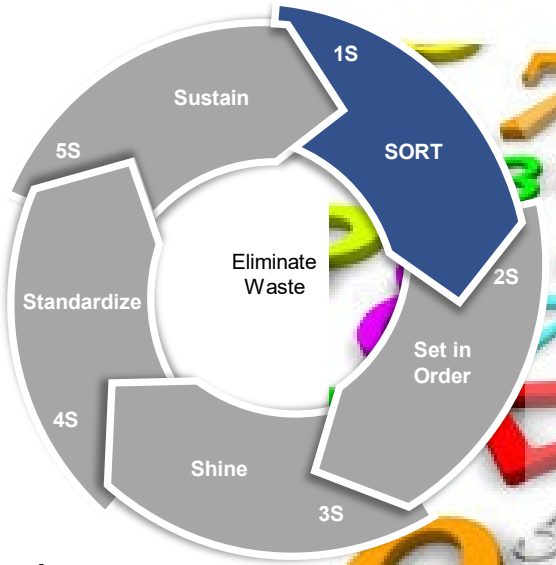
What was the highest score?

Lowest score?

Are you happy?



In round 2, our project team has started to implement 5S. With their SORT, they have eliminated numbers 50 and above.

When I say "GO" start looking for numbers in order.

How did this go?

Play – Round 2

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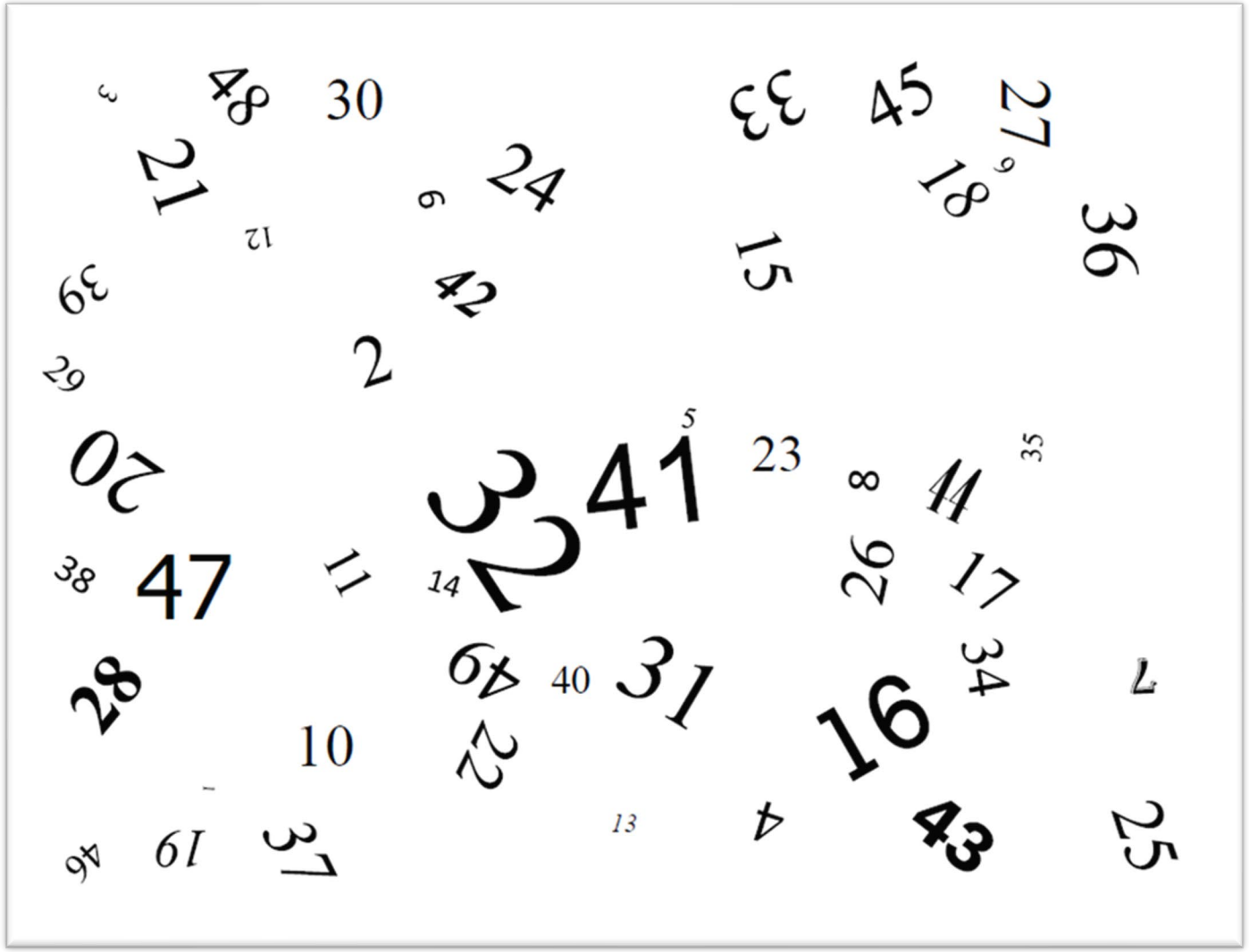
5

STOP!



5S Numbers Game – Round 3

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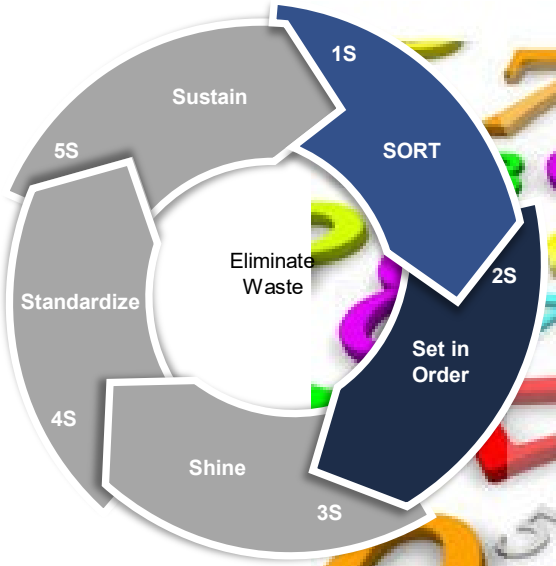
What was the highest score?

Lowest score?

Are the results better?



Let's keep going.

In round 3, our project team is continuing with their 5S implementation. They have installed a racking system with "1" in the bottom left and numbers moving in a pattern.

When I say "GO" start looking for numbers in order.

Are the results better this time?

Play – Round 3

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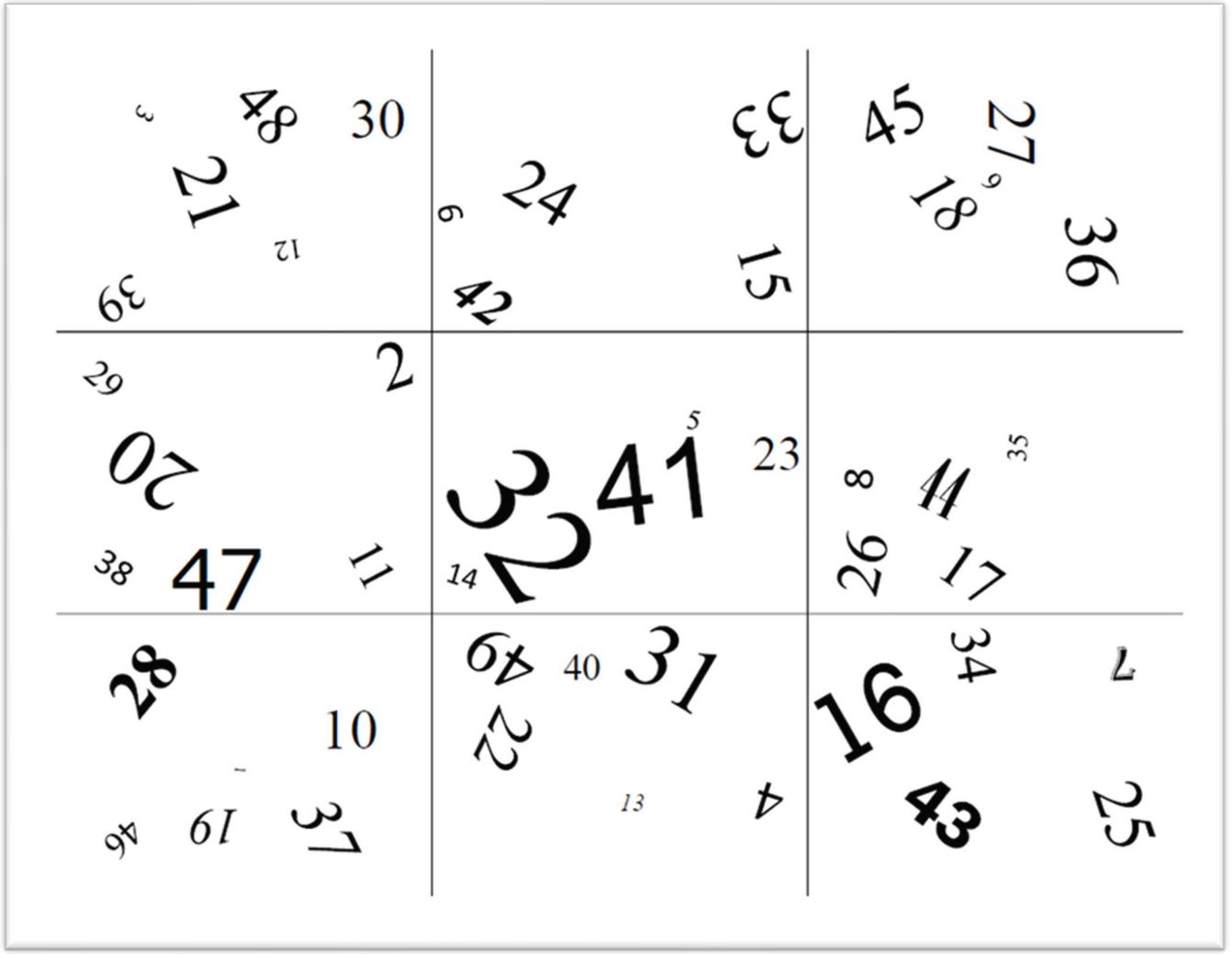
STOP!



5S Numbers Game – Round 4

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What is the highest score?

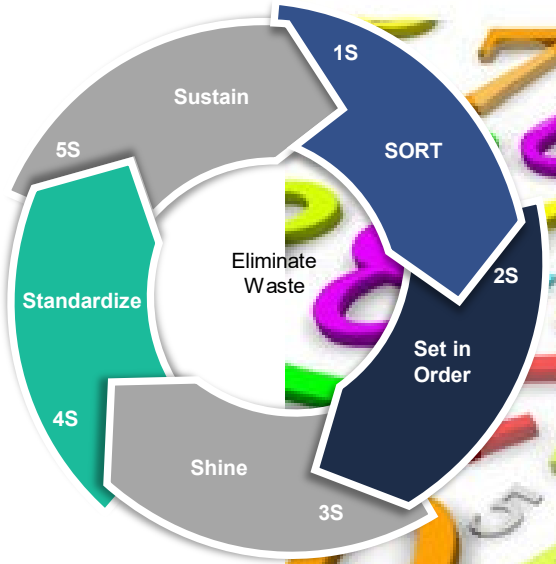
Lowest score?

Shall we keep going?

Let's try again, ready…

In round 4, our project team has determined the racking system, while better, was not visually easy to use. Therefore, the team has implemented a standardized method for the numbers.

When I say "GO" start looking for numbers in order.



Was the improvement worth it?

Play – Round 4

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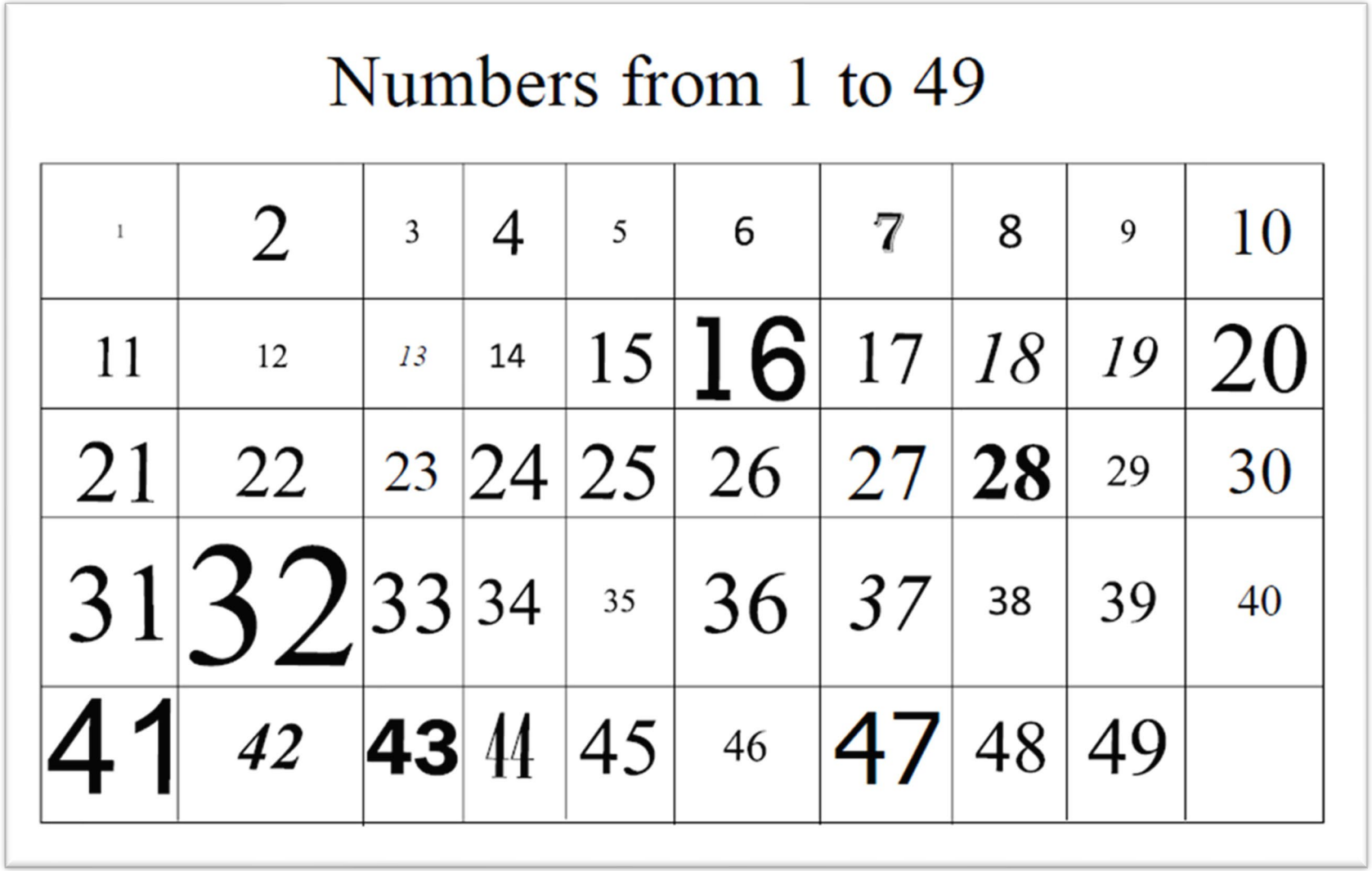
10

5

STOP!



5S Numbers Game – Round 5

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Highest score?

Lowest score?

Let's try again, ready…

In round 5, you have moved to a new project where they haven't implemented 5S and don't see its value. You have been told that on this jobsite, there are a few numbers missing. Your task is to find the missing numbers.

When I say "GO" start looking for the missing numbers.

Why don't we always work this way?

Play – Round 5

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20

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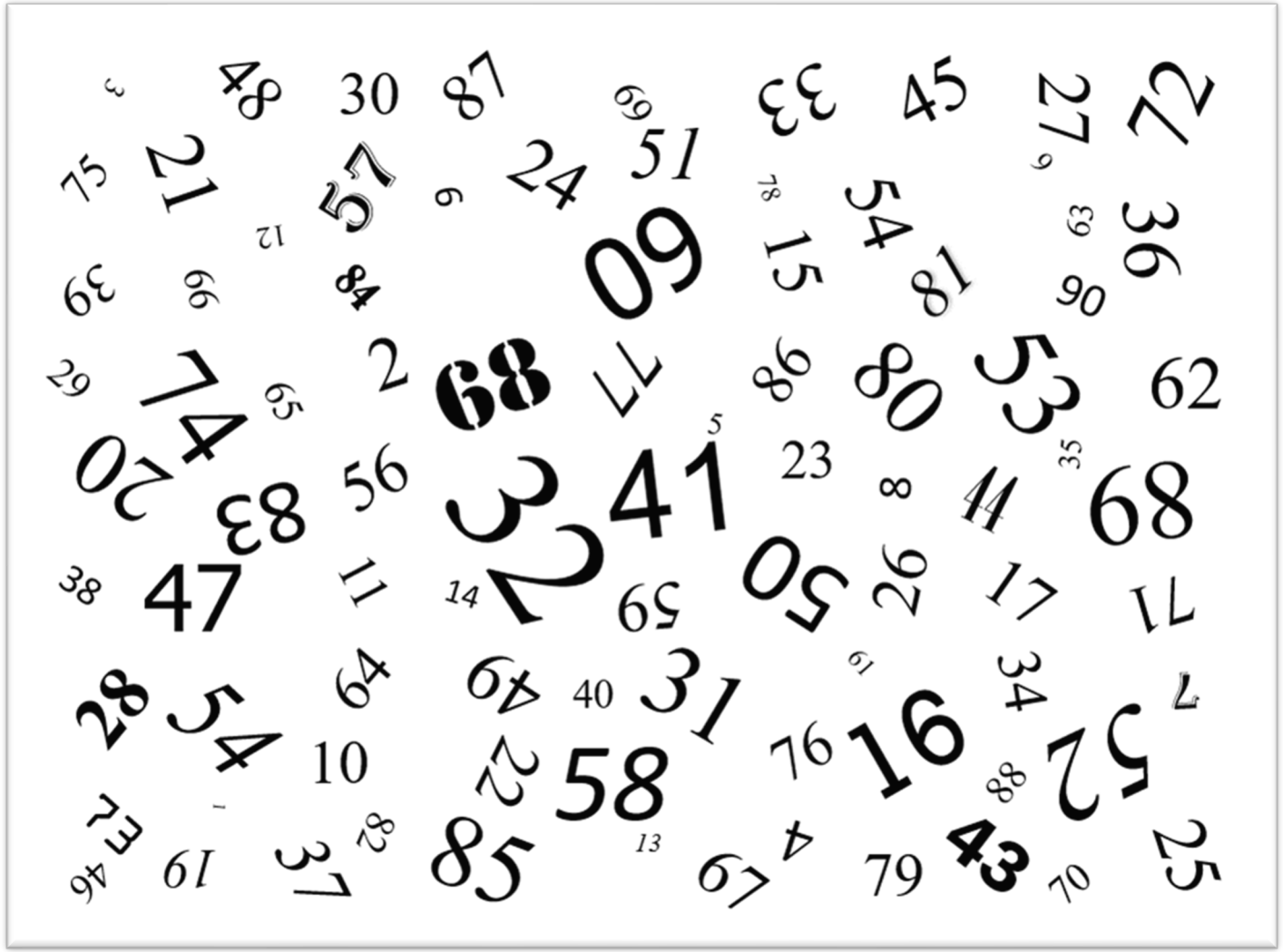
5

STOP!



5S Numbers Game – Round 6

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What were the numbers?

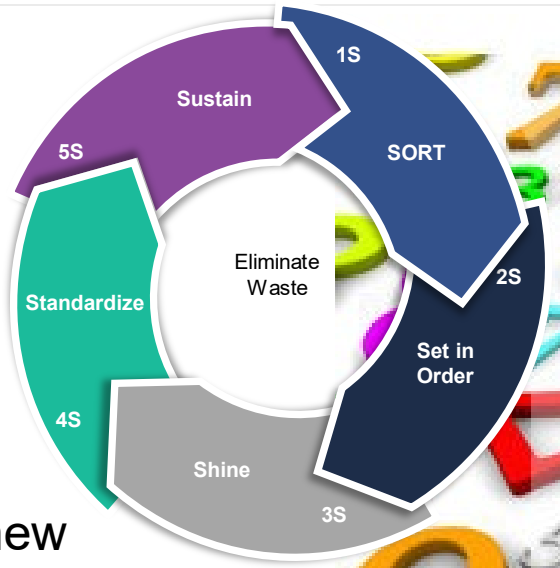
One more time,

but let's do it the right way.

Ready…

In round 6, you have convinced the new jobsite to implement 5S, and the team has sorted, straightened, installed the more visual racking system. Your task is to find the missing numbers.

When I say "GO" start looking for the missing numbers.



What is the effect on quality, productivity & cost?

Play – Round 6

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20

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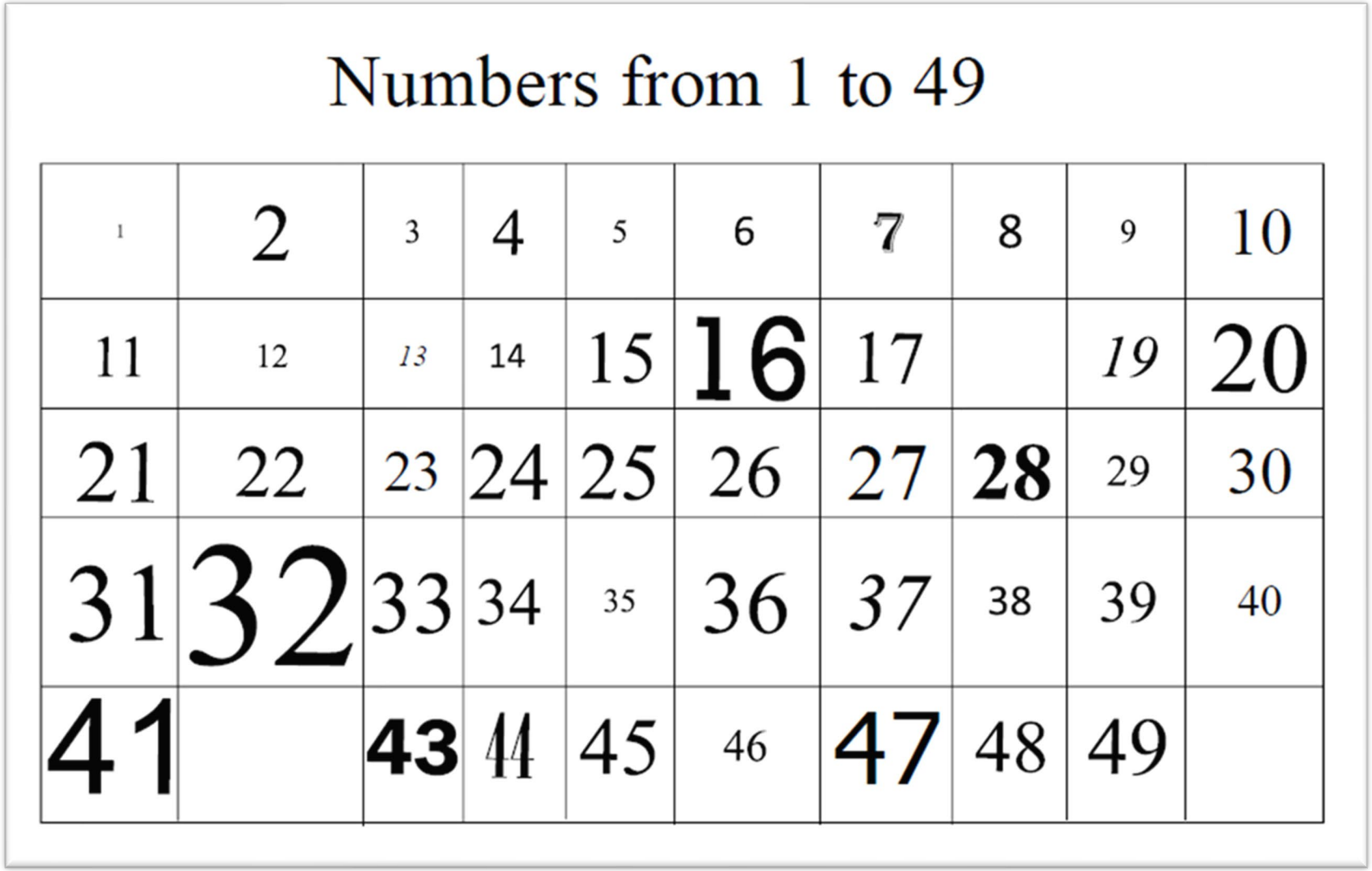
5

STOP!



5S Numbers Game

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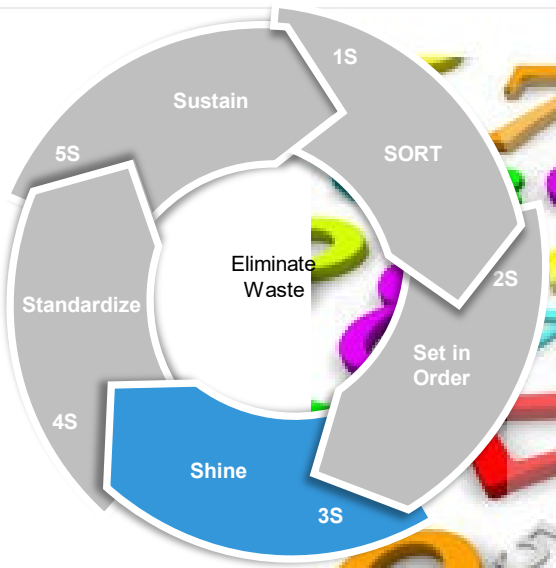
How long did that take?

This is what 5S is all about.



Why Don't we always work this way?

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5S Defined: Sort

1S Sort:

Eliminate that which is not needed.

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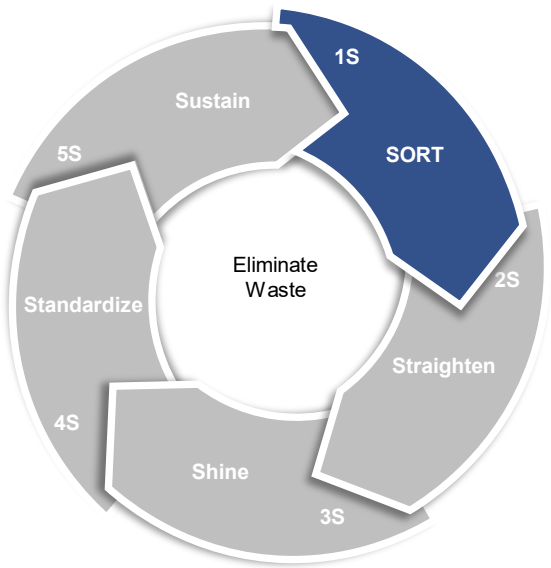
Why Sort



Determine what is needed and remove everything else.

Why?
If you don't need it… It is waste and workplace clutter.

Less clutter equals fewer hazards.

It takes effort and costs money to store unused items.

It gets in the way of what you really want.

Done-Done = Gone-Gone

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5S Defined: Set in Order

2S Set in Order:

Organize what remains after sorting.

(Orderliness)

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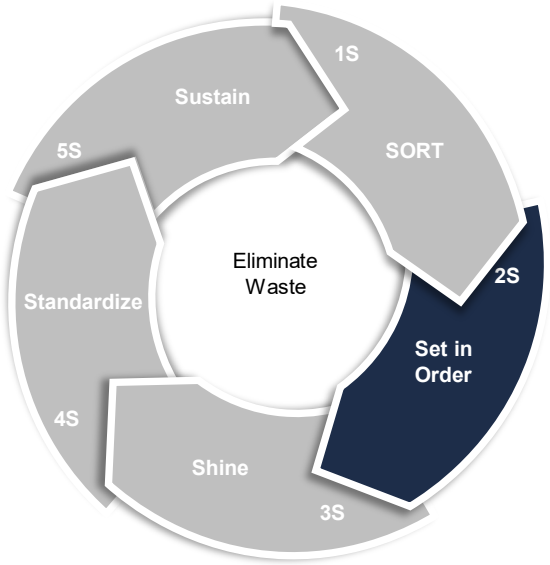
Why Set in Order



Set in order… a place for everything and keep it there.

Why?

Reduce waste from excess motion and open up space that can be used for other things.

Gordie Howe International Bridge

5S at SaskTel project, Regina

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5S Defined: Shine

3S Shine:

Clean and inspect the work area.

(Cleanliness)

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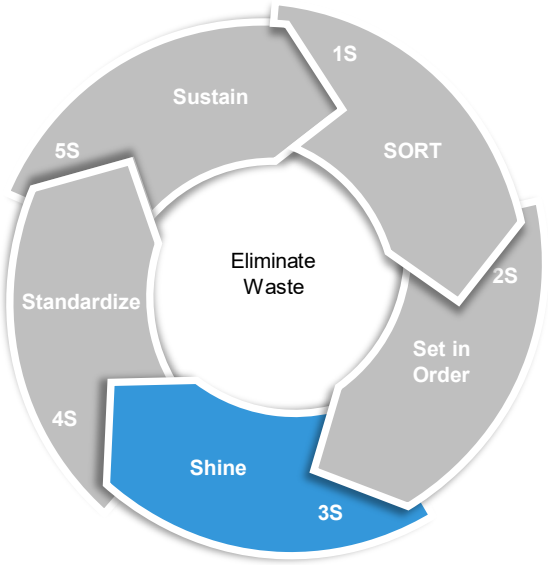
Why Shine



Clean and keep it clean …all the time

Why?
Clean as you go is more efficient than clean up afterwards.

It is safer to work in a clean environment.

Prevent dirt and debris in the first place.

Keep tools and machinery in good repair.

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5S: Shine

What will this look like in 5 minutes?

+

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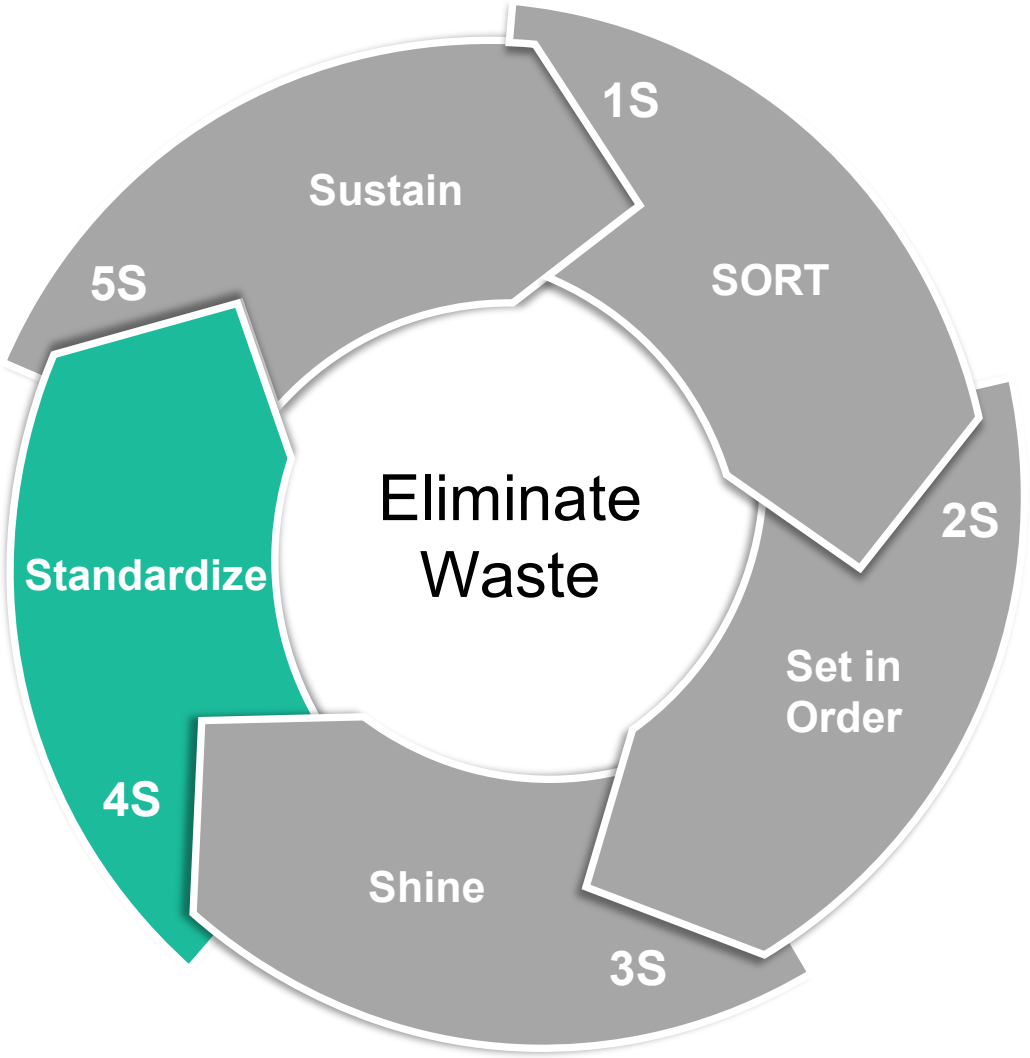
5S Defined: Standardize

4S Standardize:

Develop system and procedures to maintain and monitor the first 3S's.

(Create standards)



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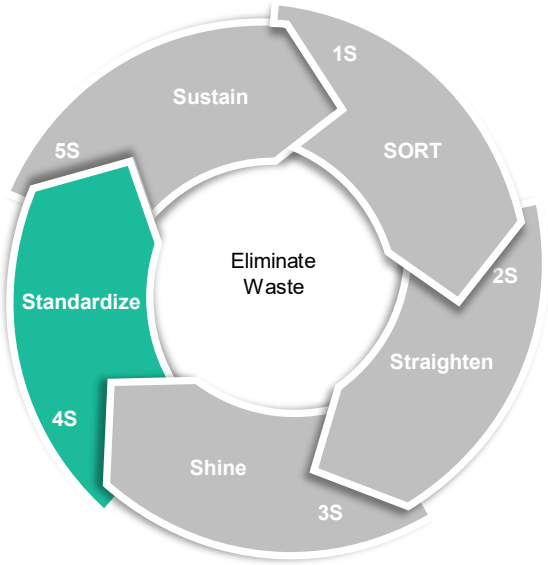
Why Standardize



Create standard ways to stay organized and clean.

Why?
So the work can be repeated and improved without wasted effort.

Everything becomes easier to maintain, train, support, buy and replace.

Reduces burden, confusion and wasted time. Creates a platform for innovation.

To standardize is to simplify.
What are your thoughts?

How is standardization a platform for innovation?

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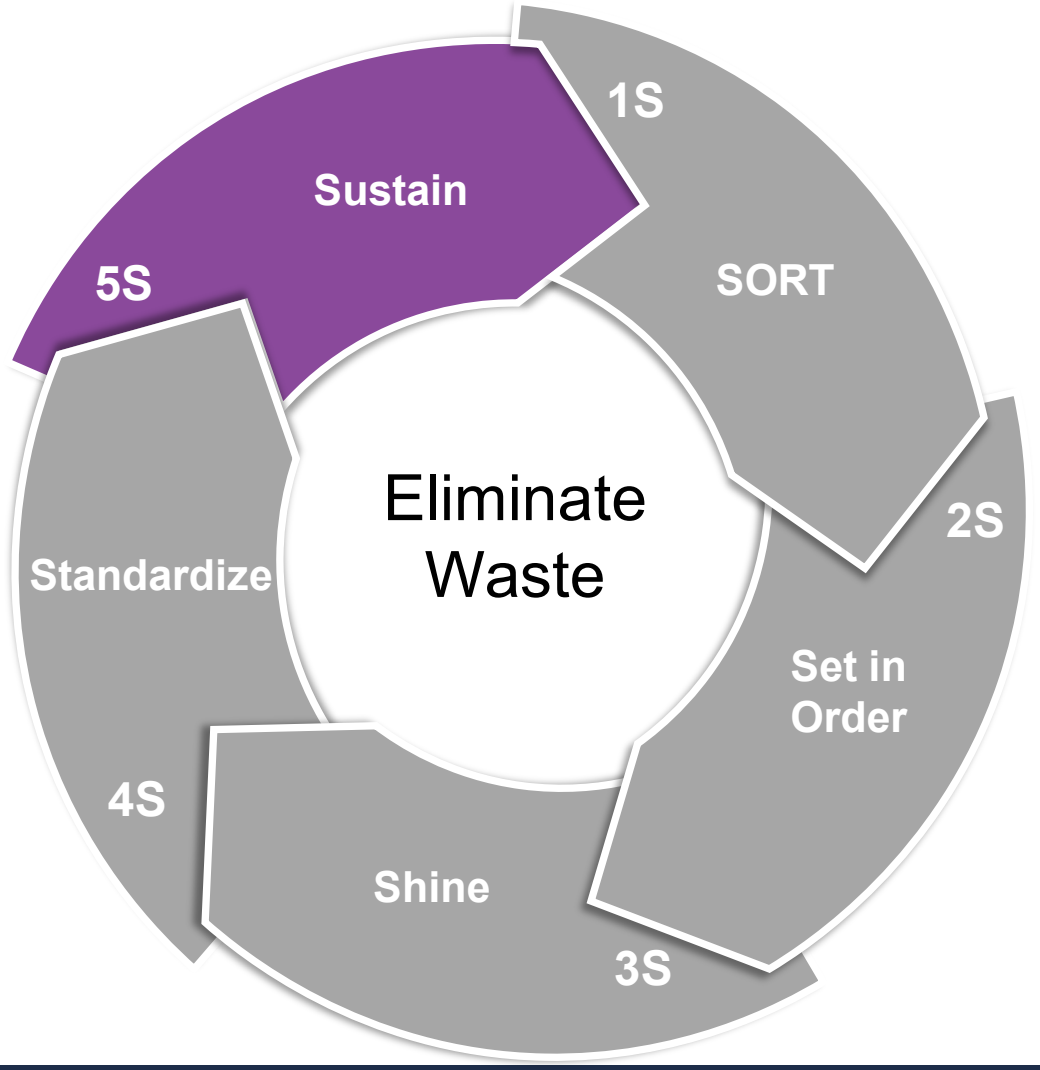
5S Defined: Sustain

5S Sustain:

Maintain a stabilized workplace through continuous improvement.

(Self-discipline)



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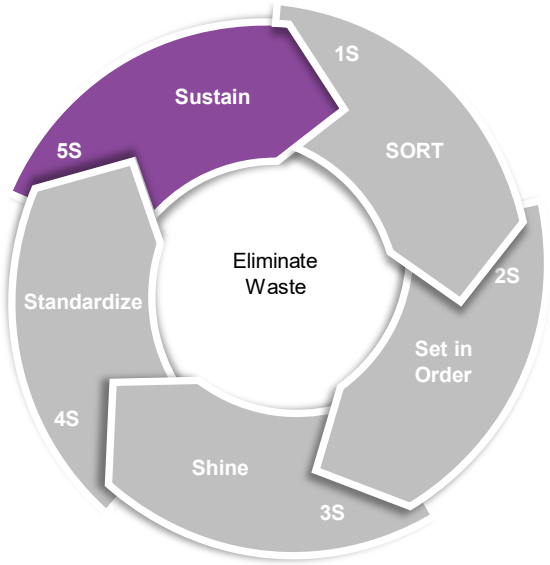
5S: Sustain



Self-discipline to keep it going.

Why?

To continue the benefits of 5S:

- Have someone be responsible for it.
- Have a process in place to keep it going.
- Make the workplace visual, easy to see when something is out of place.

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5S Review

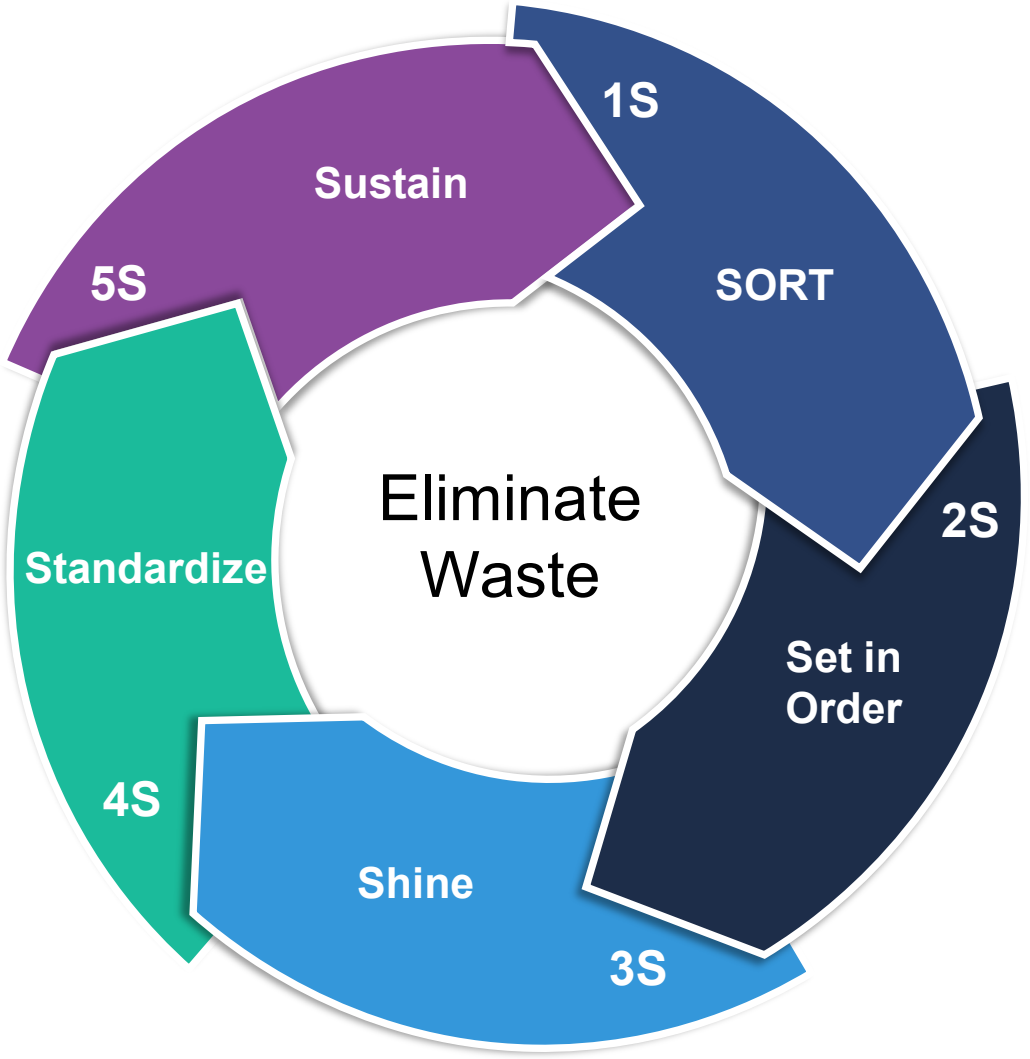
1S Sort:
Eliminate that which is not needed.

2S Set in Order: (Orderliness)
Organize what remains after sorting.

3S Shine: (Cleanliness)
Clean and inspect the work area.

4S Standardize: (Create Standards)
Develop system and procedures to maintain and monitor the first 3S's.

5S Sustain: (Self-discipline)
Maintain a stabilized workplace through continuous improvement.



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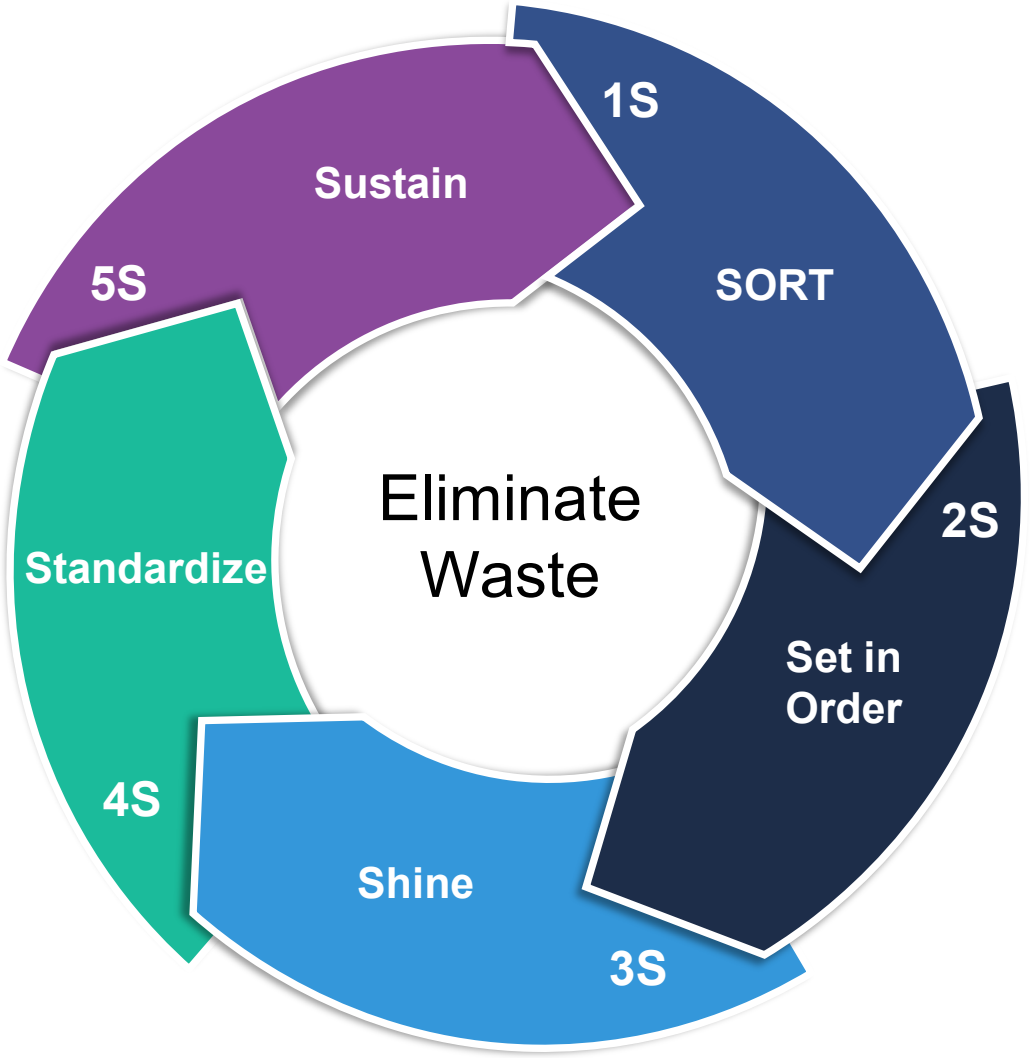
Implementing Each ‘S’



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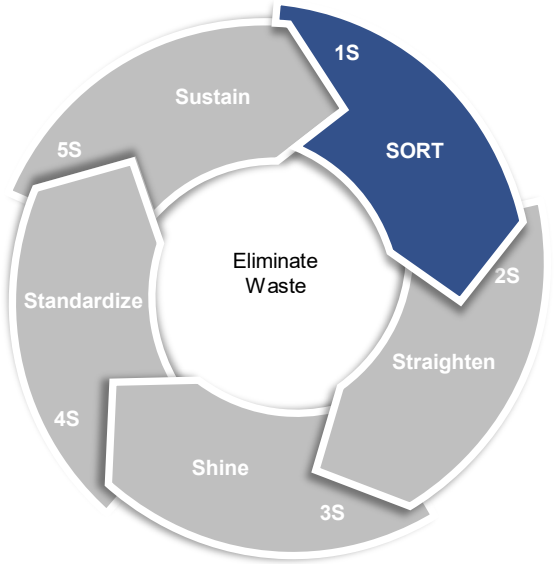
Implementing Sort

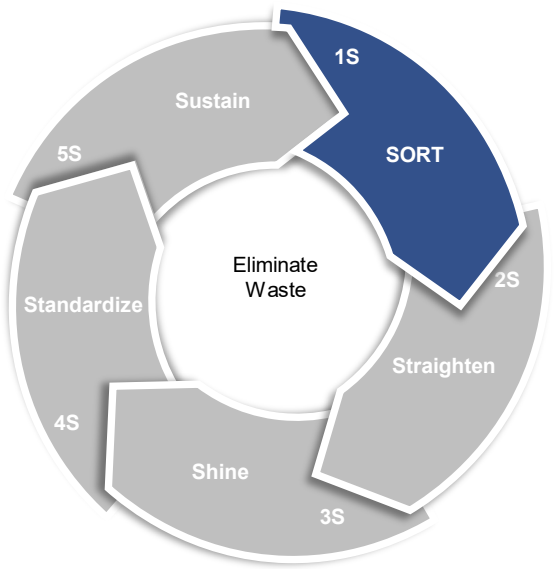


Separate necessary items from unnecessary items.

Sort into 4 Categories:

1. Items needed in the specific work area.
2. Items need in another work area. (Misplaced items).
3. Items that may be need. “Red Tag” items that you are unsure about, move to an area for holding and decision.
4. Items that are not needed.

5S in the Field: Sort



Just-in-time (JIT) Deliveries

Only what is needed on site
Remove when complete:

- Perfect for commodities and reliable suppliers
- If space is tight consider off-site
- Expect resistance at first
- Use buffers as needed, don't delay construction, be reasonable

Less stuff means less waste of space, movement, searching, hazards, damage.

5S in the Field: Sort

Just-in-time (JIT) Deliveries

Is it being delivered so that we have a full truck?
Or so we can bill for it?
Or are we ready to use it?

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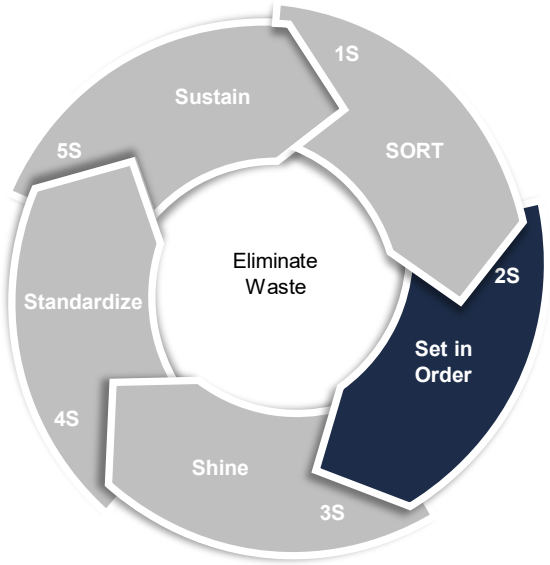
Implementing Set in Order

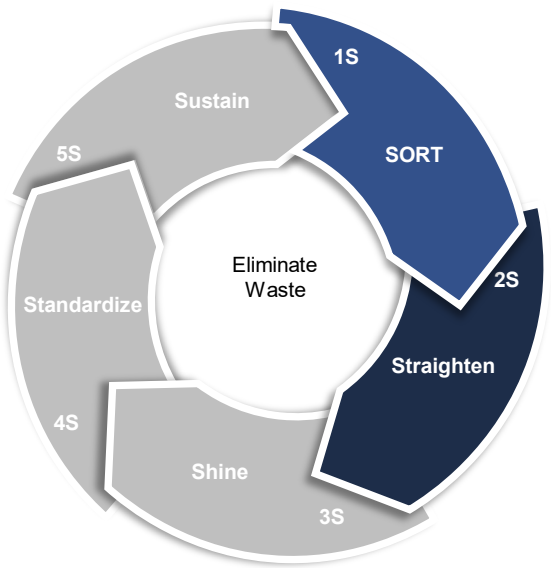


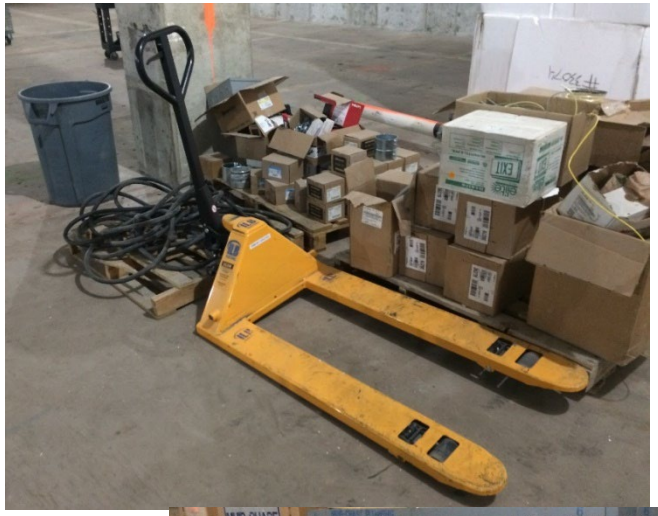
After sorting items, decide how to organize them.

Methodology:

1. Provide easy access to frequently used items.
2. Group like items into logical categories.
3. Make item homes visual to make it clear when an item is missing or misplaced.
4. Use containers appropriate for housing the items.
5. Label containers or locations for items.
6. Be flexible, the initial pass will delivery significant improvement, more potential improvements may reveal after a period of time.

5S in the Field: Set in Order





Keep materials and tools mobile and close to the work.

Everything on Wheels

5S in the Field: Set in Order

Keep materials and tools mobile and close to the work.

How does this prevent damage?
Increase productivity?
Improve safety?

Vs.

5S in the Field: Set in Order

Keep materials and tools mobile and close to the work.

Aim to keep tools and materials within 20 feet of the work.

Less than 20 feet

5S in the Field: Set in Order

Organize and label work areas.

Receiving Area

Material Storage Bin Labels

Receiving Bins For Site Distribution

5S in the Field: Set in Order

Keep materials and tools mobile and close to the work.

5S in the Field: Set in Order

What is good?
What can improve?

5S in the Field: Set in Order

Keep electrical cords up and out of the way.

Vs.

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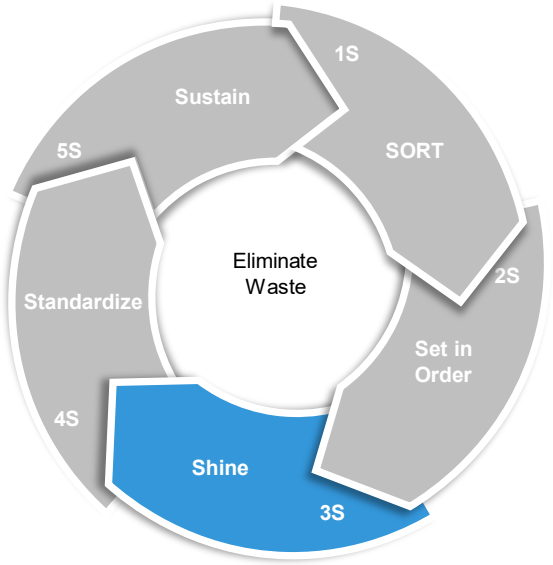
Implementing Shine



After Straightening items, elevate the work area by cleaning.

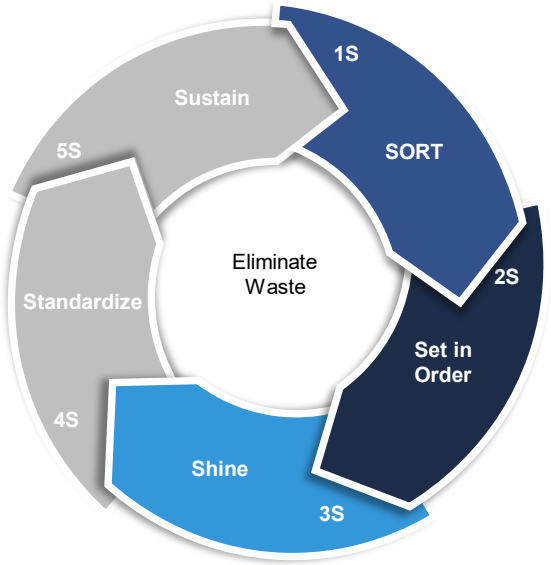
Methodology:

1. Using appropriate cleaners and tools make the work area sparkle.

1. Clean to understand. Use cleaning to uncover early warning signs of problems yet to come.

2. After cleaning, inspect the items and are to examine the condition.

5S in the Field: Shine



Continuous makes clean and organized the norm.
Once a week makes dirty and disorganized the norm.

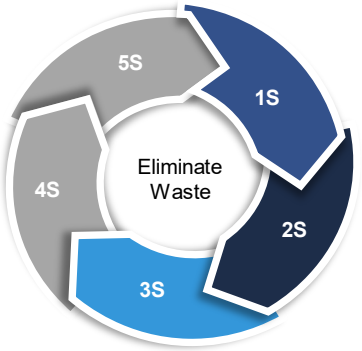

Courtesy PCL Construction

Keep the workplace neat and clean.

Always clean! Not just on Friday afternoon.

- Address dirt/waste at the source
- Clean as you go

5S in the Field: Shine

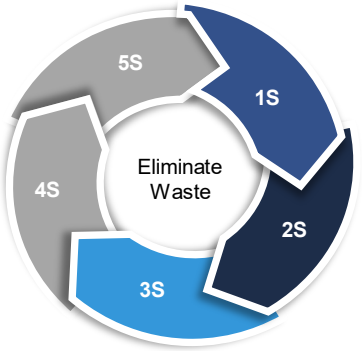


Respect for people.

- Enough toilets
- Clean
- Close to the work

What do you see?
What does this say about respect?

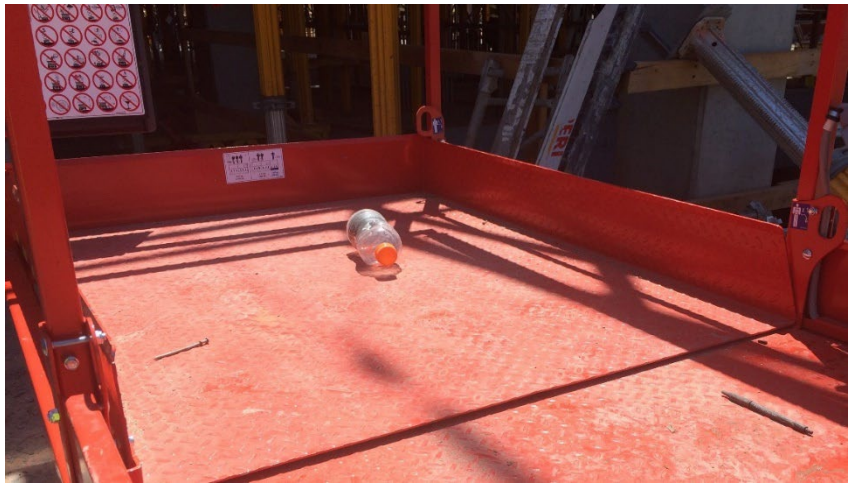
5S in the Field: Shine



Which one “shines”?

How does this relate to safety?

Zero Tolerance:
To Tolerate is to Validate



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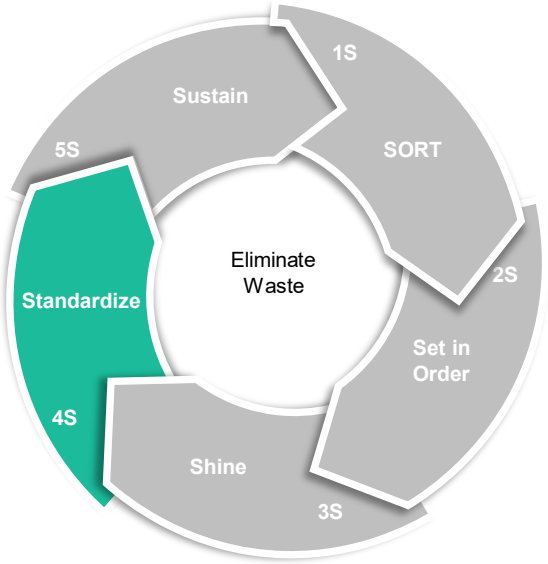
Implementing Standardize



Standardize transforms 5S to a reproducible set of activities.

Methodology:

1. Document the tasks.
2. Capture the important essence of each task.
3. Create checklists with a name for each task.
4. Determine a way to organize the checklist (role, frequency of implementing, relationship).

5S in the Field: Standardize

Set the expectation.

This picture is posted in the work area.

How does this simple visual tool help keep the work area clean?

Courtesy Turner Construction

5S in the Field: Standardize

Hold to the expectation.

*"When it comes to standards, as a leader, it's not what you preach, **it's what you tolerate**. When setting expectations, no matter what has been said or written, if substandard performance is accepted and no one is held accountable – if there are no consequences – **that poor performance becomes the new standard.**"*

- from Extreme Ownership: How U.S. Navy SEALs Lead and Win by Jocko Willink & Leif Babin

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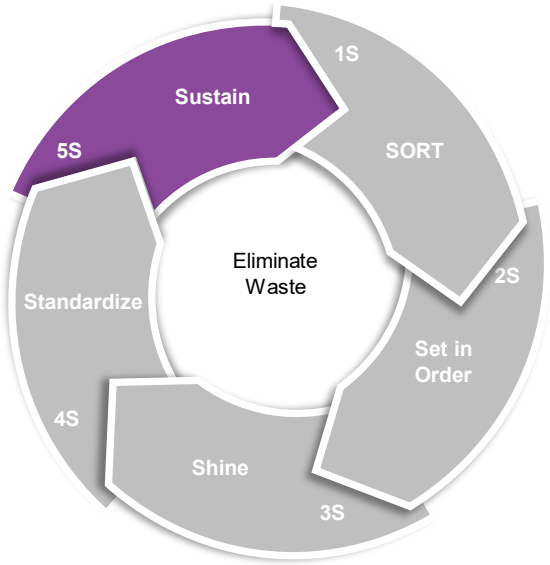
Implementing Sustain



Sustain assures that 5S is applied on an ongoing basis.

Methodology:

1. Create a schedule embedding 5S practices as scheduled tasks.
2. Teach the 5S tasks through demonstration.
3. Supervise others until the 5S tasks become habits.
4. PDCA and adapt as necessary.

5S in the Field: Sustain

Keep it going.

What can happen if we don't have enough trash cans, brooms or empty the dumpsters?

Which is better… remove trash or don't bring it on site in the first place?

Good start. But, why wasn't it dumped?
Is there enough dumpster capacity to support a clean jobsite?

5S in the Field: Sustain

Keep it going.

Stay Disciplined!

- Trades clean as they go.
- Work area is clean at end of shift or completion of task (whichever comes first).
- Don’t start working in a dirty area.
- Superintendent and team members should walk site every day.
- Show pictures, request corrective action, verify.

5S in the Field: Sustain

Keep it going.

- Make 5S a brief agenda item on daily meeting.
- Deliveries are a regular part of work planning meeting (In quantities that support 5S).

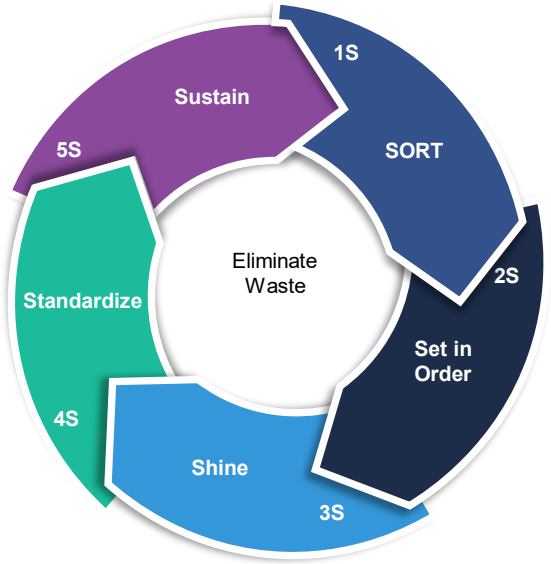
Courtesy of Turner Construction

5S in the Field: Sustain

Keep it going.

Involve trades in ongoing planning of laydown.
Keep materials and tools close to the work.

5S in the Field: Sustain



Make it easy to stay organized.

5S in the Subcontract

Possibility for how to word a subcontract:

5S IN THE SUBCONTRACT

On this project, we will use 5S thinking and practice to positively influence safety, quality, productivity and to make work flow efficiently. All project participants will apply 5S methods in all their work including on site, in the supply chain and in documentation.

Under the direction of Contractor, the entire construction team will collaborate to take a whole job approach to the organization, flow, delivery and removal of tools, equipment and materials.

Subcontractor tools, equipment and materials are to be kept organized. Laydown areas shall be assigned to each subcontractor and may change frequently throughout the course of the project. In some cases, due to jobsite constraints, assigned laydown may be limited or offsite. The team will work together to keep needed materials and tools as close to the work as possible. We will work to an **"everything on wheels"** policy. Subcontractors shall ensure that all materials are stored in a mobile fashion by using, without limitation, rolling cabinets, pipe racks with casters, or wheeled containers as much as reasonably possible such that laydown areas can be quickly repositioned. Subcontractors are to ensure that worker pathways and primary access to and from work areas are maintained.

Tools, equipment and materials shall only be brought on site **"just-in-time"** when they are needed and ready for use. Accordingly, subcontractor shall ensure that materials are ready for delivery to support the current project schedule to maintain workflow on site. Early delivery, such as to maintain a buffer of material, shall only be with the approval of Contractor. Once work is complete, tools, equipment and any remaining materials are to be promptly removed.

5S in the Subcontract

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Set the expectation

Collaboration

Make work flow efficiently

On this project, we will use 5S thinking and practice to positively influence safety, quality, productivity and to make work flow efficiently. All project participants will apply 5S methods in all their work including on site, in the supply chain and in documentation… the entire construction team will collaborate to take a whole job approach to the organization, flow, delivery and removal of tools, equipment and materials.

5S IN THE SUBCONTRACT

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5S in the Subcontract

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Everything on Wheels

Keeps work areas clear and makes it simple to have materials and tools close to the work.

Subcontractor tools, equipment and materials are to be kept organized. …The team will work together to keep needed materials and tools as close to the work as possible. We will work to an ***"everything on wheels"*** policy. …all materials are stored in a mobile fashion …as much as reasonably possible such that laydown areas can be quickly repositioned. …ensure that worker pathways and primary access to and from work areas are maintained.

5S IN THE SUBCONTRACT

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5S in the Subcontract

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Just-in-time

Deliver materials or equipment when it is needed and not before.
If needed, set buffers to insure the consistent flow of material.

Tools, equipment and materials shall only be brought on site ***"just-in-time"*** when they are needed and ready for use. …ensure that materials are ready for delivery to support the current project schedule to maintain workflow on site. Early delivery, such as to maintain a buffer of material, shall only be with the approval of Contractor. Once work is complete, tools, equipment and any remaining materials are to be promptly removed.

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5S in the Subcontract

Lean Construction Institute
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Nothing hits the ground

Continuous cleanup
No more Friday composite cleaning crew
Trades clean as they go

The site shall remain clean at all times following a ***"nothing hits the ground"*** policy. All areas of the project… must remain clean and free of debris… While excess material may naturally touch the ground during installation, to the extent practical, the subcontractor will "clean as you go" (and) shall not leave the work area without entirely cleaning the area, either per shift or upon completion of the task, whichever occurs first.

5S IN THE SUBCONTRACT

Excess or disorganized tools, equipment and materials will not be tolerated should it be deemed by Contractor that their presence or current condition has the potential to negatively impact safety, efficiency, the flow of work or the general morale or cooperation of other subcontractors. Subcontractor shall oblige any request by Contractor, acting reasonably, to organize or remove the tools, equipment or materials from the site. Correction shall be within 24 hours of notice or immediate if an unsafe condition exists.

The entire site shall remain clean at all times following a **"nothing hits the ground"** policy. All areas of the project, including work, laydown, lunch and parking areas must remain clean and free of debris in a manner acceptable to Contractor. While excess material may naturally touch the ground during installation, to the extent practical, the subcontractor will "clean as you go". The subcontractor shall not leave the work area without sweeping and removing all debris, either per shift or upon completion of the task, whichever occurs first. Subcontractor shall oblige any request by Contractor, acting reasonably, to remove any subcontractor generated debris. Correction shall be within 24 hours of notice or immediate if an unsafe or unhealthy condition exists. Failure to do so may result in the work performed in your behalf at subcontractor's expense.

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5S in the Field: Sustain

Simple 5S Assessment

- This is not an audit. No points. No check boxes.
- This is a tool to help teams.
- You should always be able to find something to improve.
- Go where the work is and observe.
- What is the problem? Root cause? Countermeasure?

5S TEAM ASSESSMENT A tool for teams to self-assess their work area	Area	
	Date	
	Assessed by	

You should always be able to find something to improve. Go to where the work is. Observe.
What can improve? Is there a problem? What is the root cause? Areas to assess can include outside the fence or building, site, roadways, parking, laydown, entrances/exits, exteriors, corridors, hoists, kitchen, eating area, toilets and restroom, meeting areas, work areas, desks, gang boxes, storage areas.

5S Questions	Observation Notes
SORT ○ Is there ***anything*** that doesn't need to be here? ○ Was it delivered too soon? Is there too much? Are we finished with it and should remove, dispose, archive or send it back? ○ Postings/directions current? Remove anything out of date. ○ Are we using "**just-in-time**" delivery?	
STRAIGHTEN ○ Is anything out of place? Why? ○ Is there a place for it? Simple visuals to show where belongs? ○ Tools and materials are close to the work? ○ Safety equipment clearly labelled and easily accessible? ○ Is there clear directional and location signage? ○ Is "**everything on wheels**" or pallets with pallet jack? ○ Power cords off the ground, sufficient lighting?	
SHINE ○ Is the team using "**nothing hits the ground**"? ○ Is trash debris going straight in to rolling containers? ○ What can be done to reduce trash generation? ○ Is there anything that is not clean or well maintained? ○ Sufficient cleaning supplies, including trash cans, brooms, dumpsters? Are they properly marked? Close by? ○ Trash containers regularly emptied. Nothing overflowing. ○ Are floors dry/well-drained? Site ready for rain/mud/snow? ○ Good neighbors: Site fencing and signage clean and maintained, no trash outside fence, light or noise pollution. ○ Roadways and parking well marked, clean and clear? ○ Meeting Areas: Clean and things put away after meetings.	
STANDARDIZE ○ Can we improve a standard process? Make it simpler? ○ Is there anything that can be standardized? ○ Instructions clear how the process works, how to clean and straighten, where things belong, how and when to reorder?	
SUSTAIN ○ Is someone responsible? Is there a process in place to sustain? ○ Are standards enforced? Regular assessments and follow-up? ○ Is it visual? Instructions clearly displayed and easy to follow? ○ Is 5S the way things are done, people are proud of their jobsite and work areas?	

Updated August 14, 2019. Ideas for improvement are encouraged.
Courtesy Milestone Lean Consulting LLC

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How do I know I'm doing Great?

Sort

- Active debris prevention actions
- Documented responsibilities & timeline

Set in Order

- Active material storage plan (By project & scope)
- 30 second Rule
- Only needed tools & material are in work area

Shine

- Inspections actively performed during cleaning & restocking (By all)
- Visuals actively integrated with work area

Standardize

- Healthy 5S Plan (goals created by team)
- Active 5S Plan (routine updates)
- Work area visuals drive flow
- You are improving your standard

Sustain

- Project lifecycle planning
- Practicing RCA with problems to develop preventative actions
- Stakeholder adoption

Achieving 5S

ACHIEVING 5S— Goals Alignment

5S Goals Alignment

Understanding shared goals and desired outcomes will be your driver to successfully implement 5S. Our experience teaches us that teams who fail, do so alone—alone in the sense that stakeholders weren't following the same plan.

So what should your efforts look like? At **LYNX**, we say let the space and the job tell us what success looks like. Then we outline a dynamic project lifecycle plan and ensure stakeholder alignment to build the foundation of our ideal 5S solution.

As your 5S efforts move forward, implementing Procurement Takt™ and practicing Root Cause Analysis (among other continuous improvement tools) will be your next optimization opportunity toward a new plateau of success.

What are the LEVELS of ACHIEVEMENT?

BASICS:
- Items identified and removed
- Organized by frequency
- Inspection/ documentation
- Organization visuals
- Activity documentation

CONTROL:
- Active plan management
- Problem areas identified with plan
- Workplace visuals

RELIABILITY:
- 30sec Rule
- Documented responsibilities and schedule
- Inspection integrated with cleaning
- Standard methods used across team

PREVENTION:
- Project lifecycle planning
- Stakeholder engagement
- Countermeasures implemented prior to problems
- RCA practiced

What does GREAT look like?

How do I know if I'm doing great? SORT
- Active debris prevention actions
- Documented responsibilities & timeline

How do I know if I'm doing great? STRAIGHTEN
- Active material storage plan (by project & scope)
- 30 second Rule
- Only needed tools & material are in work area

How do I know if I'm doing great? SHINE
- Inspections actively performed during cleaning & restocking (By all)
- Visuals actively integrated with work area

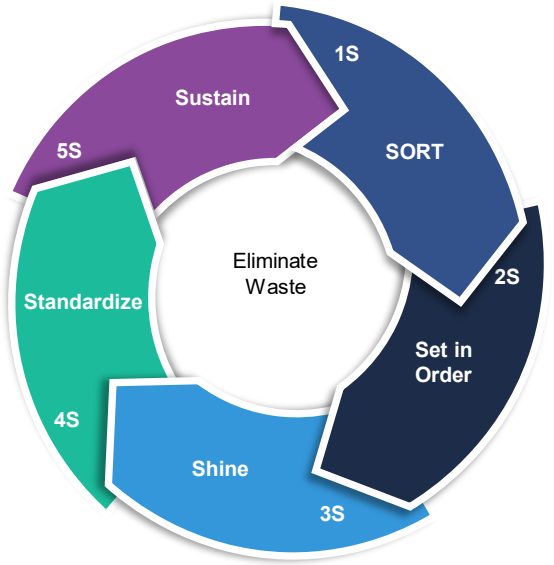
How do I know if I'm doing great? STANDARDIZE
- Healthy 5S Plan (goals created by team)
- Active 5S Plan (routine updates)
- Work area visuals drive flow
- You are improving your standard

How do I know if I'm doing great? SUSTAIN
- Project lifecycle planning
- Practicing RCA with problems to develop preventative actions
- Stakeholder adoption

LYNX Lean Services—Achieving 5S Handout
Copyright 2021

REV. January 2021

Find Waldo? (or the 5S)



PCL Construction Bakersfield – Gave their trucks some loving and saved $420,000

VS

Discussion Question

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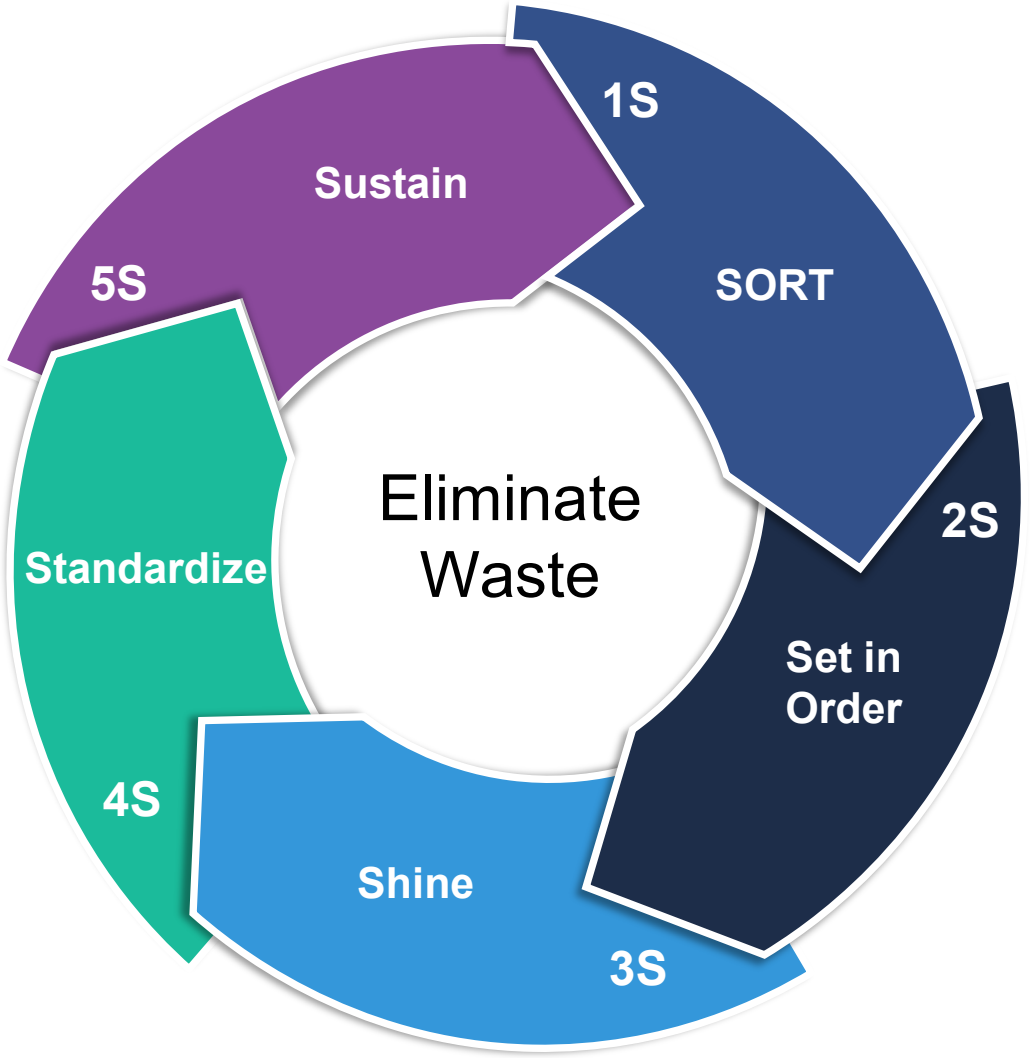
Where can you use 5S Thinking?



Case Study: Implementation

Okanagan College Trades Renewal and Expansion Project (2016 Kelowna, BC)

PCL Constructors Westcoast Inc.
By David Crowe, Superintendent

- Cleaning and safety stations in the building
- Designated laydown areas outside
- Designated tool/material laydown in building
- Just-in-time material delivery
- Mobile material racking/storage systems
- Commitment to daily clean-up by trades
- Top-down commitment and buy-in at Job Start

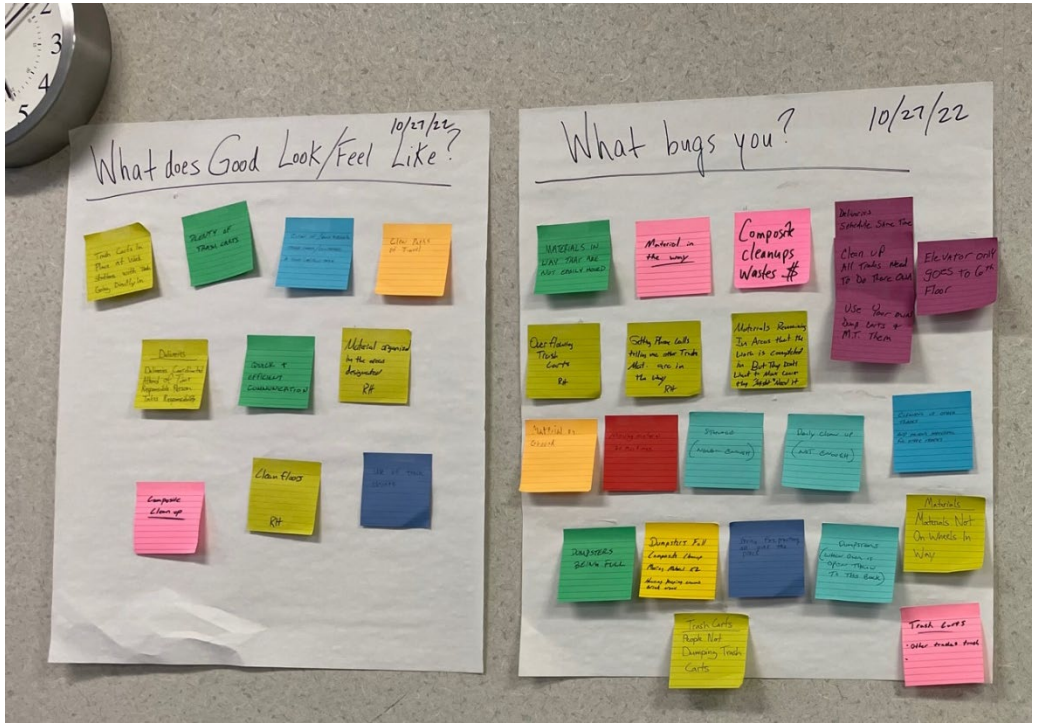
Case Study: Lessons

Okanagan College Trades Renewal and Expansion Project (2016 Kelowna, BC)

PCL Constructors Westcoast Inc.
By David Crowe, Superintendent

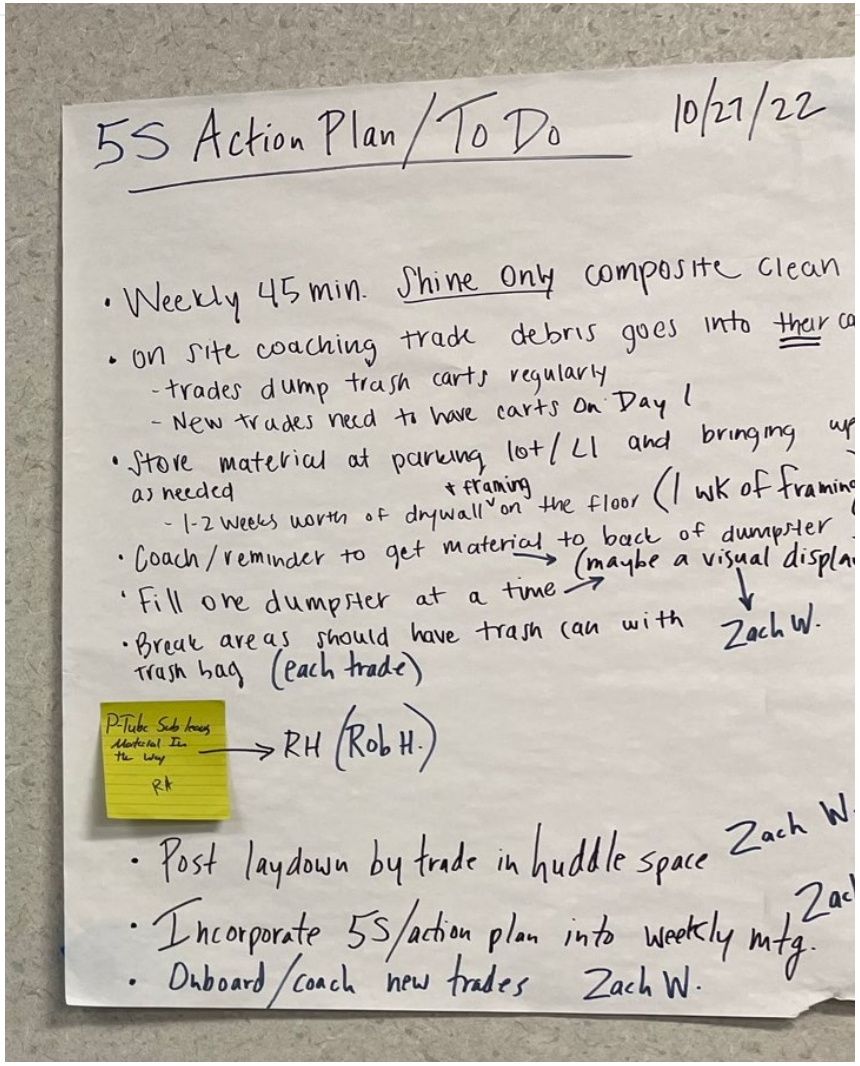
- **Required effort** to “sell” to trades & planning time.
- **Implement early:** Get management buy-in & participation.
- **Reward success:** Do not accept non-conformance.
- **Self-regulating:** Trades saw increased productivity and became ‘self-regulating’. New trades followed suit. Trades held each other accountable.
- **Workers appreciate** a clean and organized environment that is easier, more efficient, safer.
- **Costs were less** than 4 hours/day for one GC worker to maintain stations and assist in JIT delivery.

Case Study: Implementation



TriHealth Bethesda North Hospital
Montgomery, Ohio
Turner Construction
Joe Newton, Lean Champion

- Provided 5S training session to trades
- Had trades provide answers:
  - What does Good look like?
  - What bugs you?
- Trades collaborated for a project-specific action plan.
- Went from 4-hour Friday cleanup to 45 minute (sweep only..



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5S and Safety

5S together create a continuous improvement process for the work environment.

Ultimately improving the safety of the environment.

Sometimes a 6S in added, but actually should be an output of an effective 5S program.

5S is Simplicity

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Visual – Easy to see and understand
Short – To the point, uncluttered
Easy – Standard formats. Same every time
Obvious – Make it hard to put things in the wrong place

VS.

5S and Prefabrication

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Prefabrication, modularization and kitting reduces waste on site.

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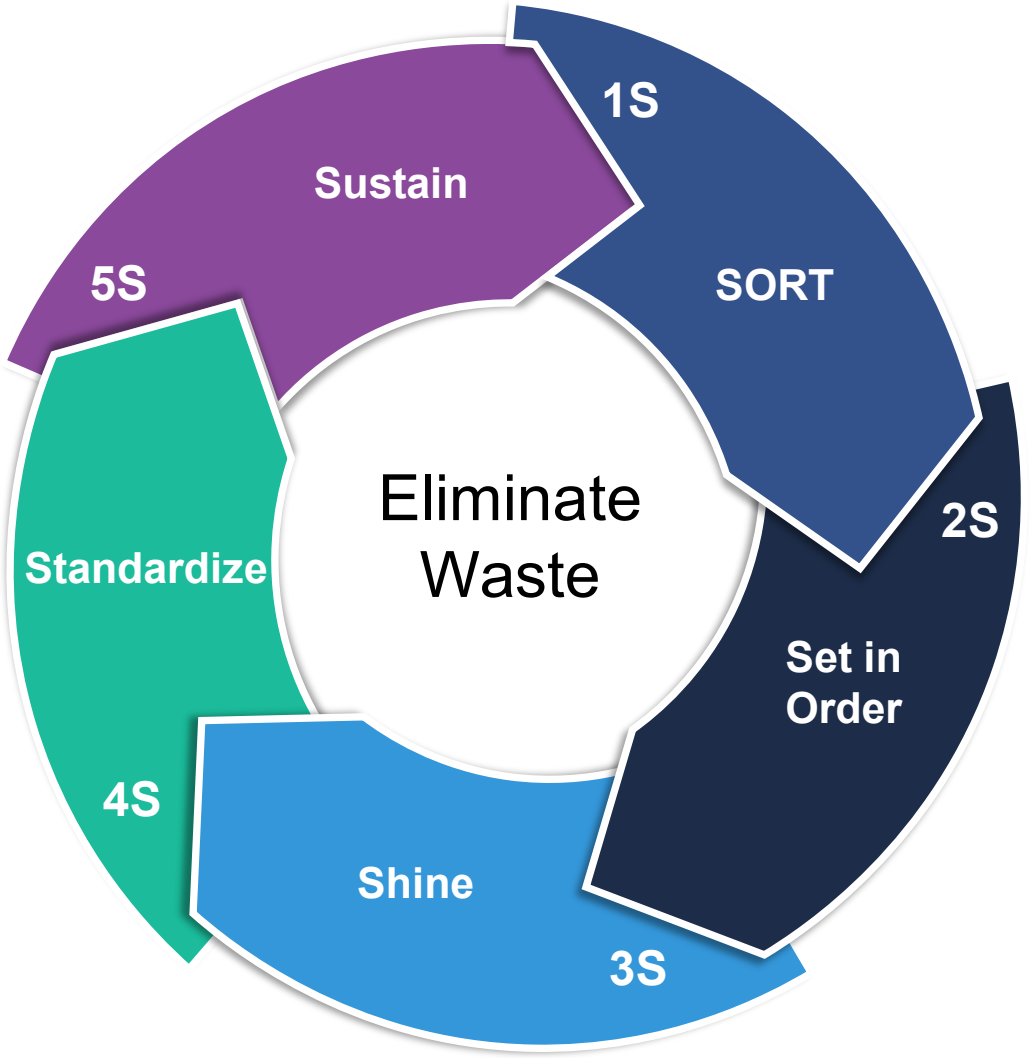
5S in the Shop

Construction is not just the field.
It includes the entire supply chain.

5S is well suited to the shop floor since this is where it was first conceived.



5S in the Shop

As prefabrication and modular construction become more common, Lean practices in the shop become more important.

5S in the Shop

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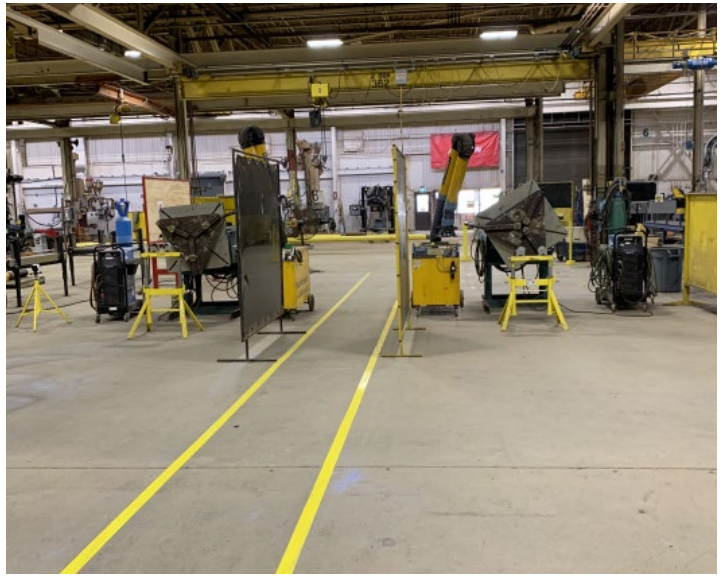
Small Bore Bay
Typical Workstation Configuration



In-Process
Kan Ban Area in use

Large Bore Bay
Typical WorkStation Configuration

Courtesy of Aecon

5S in the Shop

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Pilot Fabrication Cell 2C in use

Elbow Jigs and Line up clamps organized

Courtesy of Aecon

5S in the Shop

Designated area for both incoming and outgoing shipments

Set locations for crates and carts used for material movement in the shops

Courtesy of Aecon

5S in the Shop or the Field

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Organization of equipment and material will result in more efficient and high value use of indoor areas

Nuclear Outdoor Covered Storage

Yard Equipment Storage Location

Courtesy of Aecon

5S in the Shop or the Field

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Tools Storage

Material Tent Storage Area

Courtesy of Aecon

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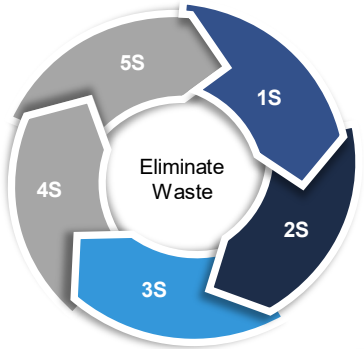
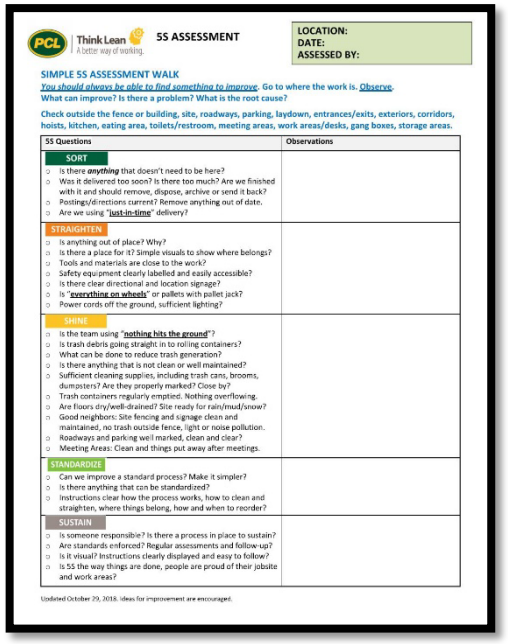
5S in the Office/Workspace

5S in the Office/Workspace



Where should we start?



PCL Think Lean — A better way of working.

5S ASSESSMENT

LOCATION:
DATE:
ASSESSED BY:

SIMPLE 5S ASSESSMENT WALK

You should always be able to find something to improve. Go to where the work is. Observe. What can improve? Is there a problem? What is the root cause?

Check outside the fence or building, site, roadways, parking, laydown, entrances/exits, exteriors, corridors, hoists, kitchen, eating area, toilets/restroom, meeting areas, work areas/desks, gang boxes, storage areas.

5S Questions	Observations
SORT	
○ Is there *anything* that doesn't need to be here?	
○ Was it delivered too soon? Is there too much? Are we finished with it and should remove, dispose, archive or send it back?	
○ Postings/directions current? Remove anything out of date.	
○ Are we using "last-in-time" delivery?	
STRAIGHTEN	
○ Is anything out of place? Why?	
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○ Tools and materials are close to the work?	
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SHINE	
○ Is the team using "nothing hits the ground"?	
○ Is trash debris going straight in to rolling containers?	
○ What can be done to reduce trash generation?	
○ Is there anything that is not clean or well maintained?	
○ Sufficient cleaning supplies, including trash cans, brooms, dumpsters? Are they properly marked? Close by?	
○ Trash containers regularly emptied. Nothing overflowing.	
○ Are floors dry/well-drained? Site ready for rain/mud/snow?	
○ Good neighbors: Site fencing and signage clean and maintained, no trash outside fence, light or noise pollution.	
○ Roadways and parking well marked, clean and clear?	
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STANDARDIZE	
○ Can we improve a standard process? Make it simpler?	
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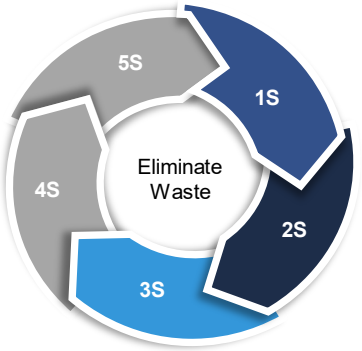
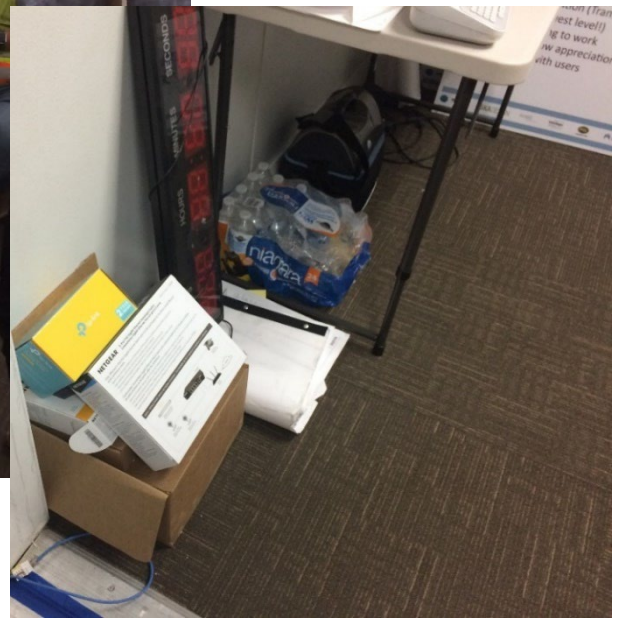
SUSTAIN	
○ Is someone responsible? Is there a process in place to sustain?	
○ Are standards enforced? Regular assessments and follow-up?	
○ Is it visual? Instructions clearly displayed and easy to follow?	
○ Is 5S the way things are done, people are proud of their jobsite and work areas?	

Updated October 29, 2018. Ideas for improvement are encouraged.

5S in the Office/Workspace



The meeting room is a great place to start…



5S in the Office/Workspace

Visual Management Demands Good 5S

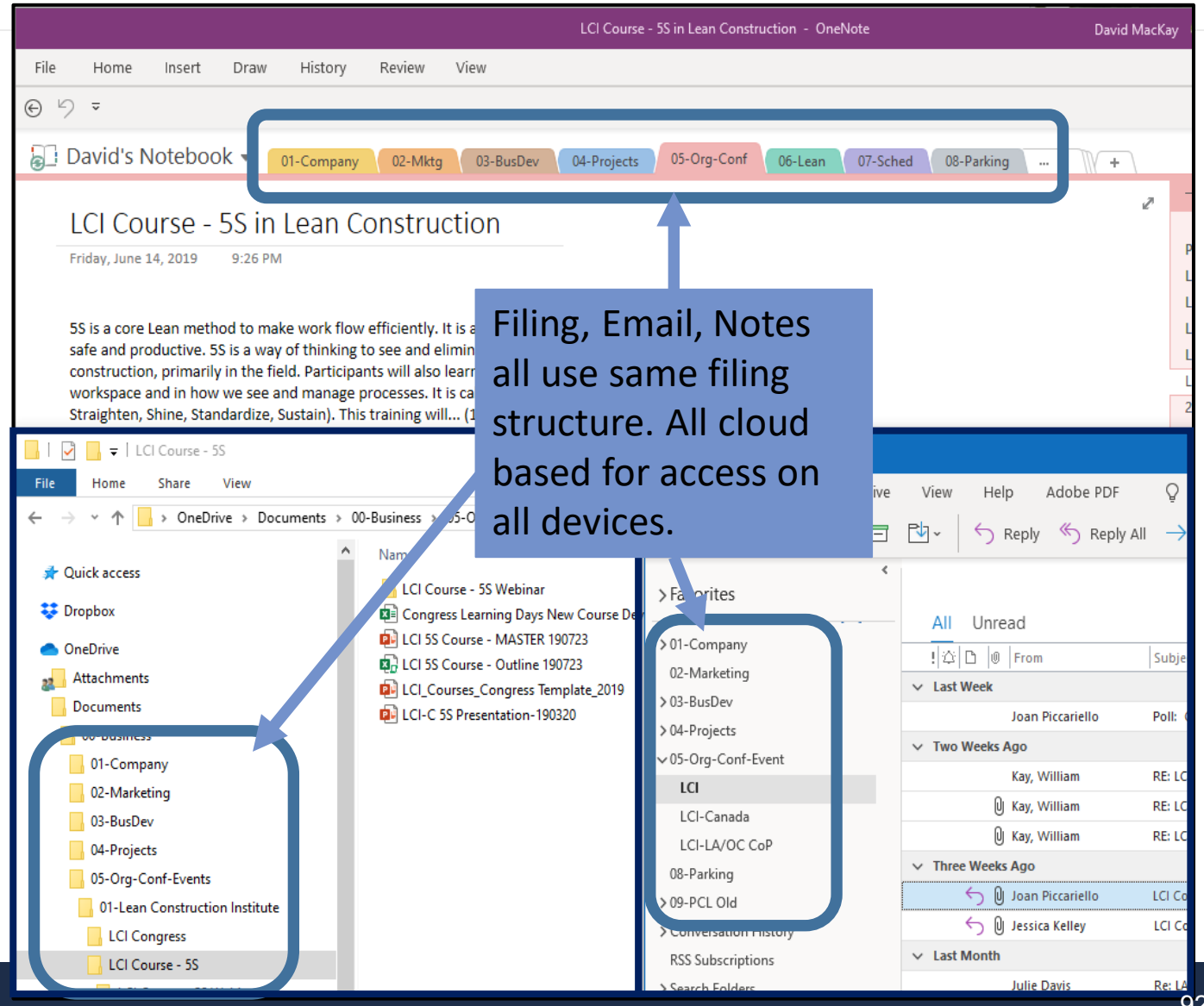
A meeting room is like a command center. To make good decisions we need to be able to see flow.

5S in the Office/Workspace

Electronic Files

30 Second Test – Can you find in a gang box, computer filing structure or supply cabinet what you are looking for in 30 seconds or less and move on?

If not, more 5S work is needed.



5S Email

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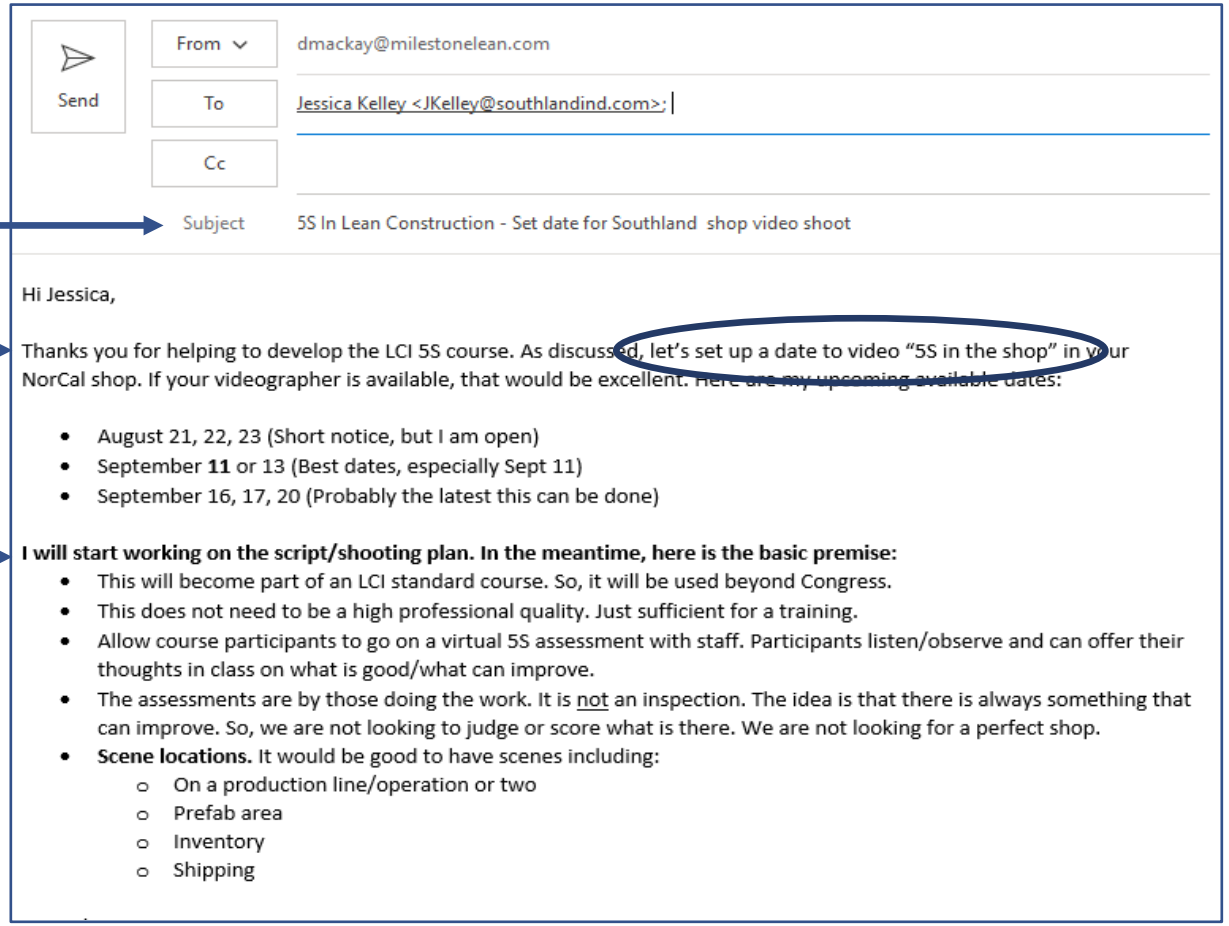
Most emails are too long, don't get to the point… and don't get read.

Subject line specific and easily searchable.
Reader knows what you want.

Put your action request in the first line.

Aim for three lines or less.
If longer, use bullets or headings.

Read it back to yourself before sending.



Send

From dmackay@milestonelean.com

To Jessica Kelley <JKelley@southlandind.com>;

Cc

Subject 5S In Lean Construction - Set date for Southland shop video shoot

Hi Jessica,

Thanks you for helping to develop the LCI 5S course. As discussed, let's set up a date to video "5S in the shop" in your NorCal shop. If your videographer is available, that would be excellent. Here are my upcoming available dates:

- August 21, 22, 23 (Short notice, but I am open)
- September **11** or 13 (Best dates, especially Sept 11)
- September 16, 17, 20 (Probably the latest this can be done)

I will start working on the script/shooting plan. In the meantime, here is the basic premise:

- This will become part of an LCI standard course. So, it will be used beyond Congress.
- This does not need to be a high professional quality. Just sufficient for a training.
- Allow course participants to go on a virtual 5S assessment with staff. Participants listen/observe and can offer their thoughts in class on what is good/what can improve.
- The assessments are by those doing the work. It is not an inspection. The idea is that there is always something that can improve. So, we are not looking to judge or score what is there. We are not looking for a perfect shop.
- **Scene locations.** It would be good to have scenes including:
  - On a production line/operation or two
  - Prefab area
  - Inventory
  - Shipping

5S Anywhere

Learn to see waste!

- Learn by doing is the best teacher
- Walk together. Involve everyone
- Help them see what it means to Sort, Set in Order, Shine

What is good? What can improve?

Discussion Question

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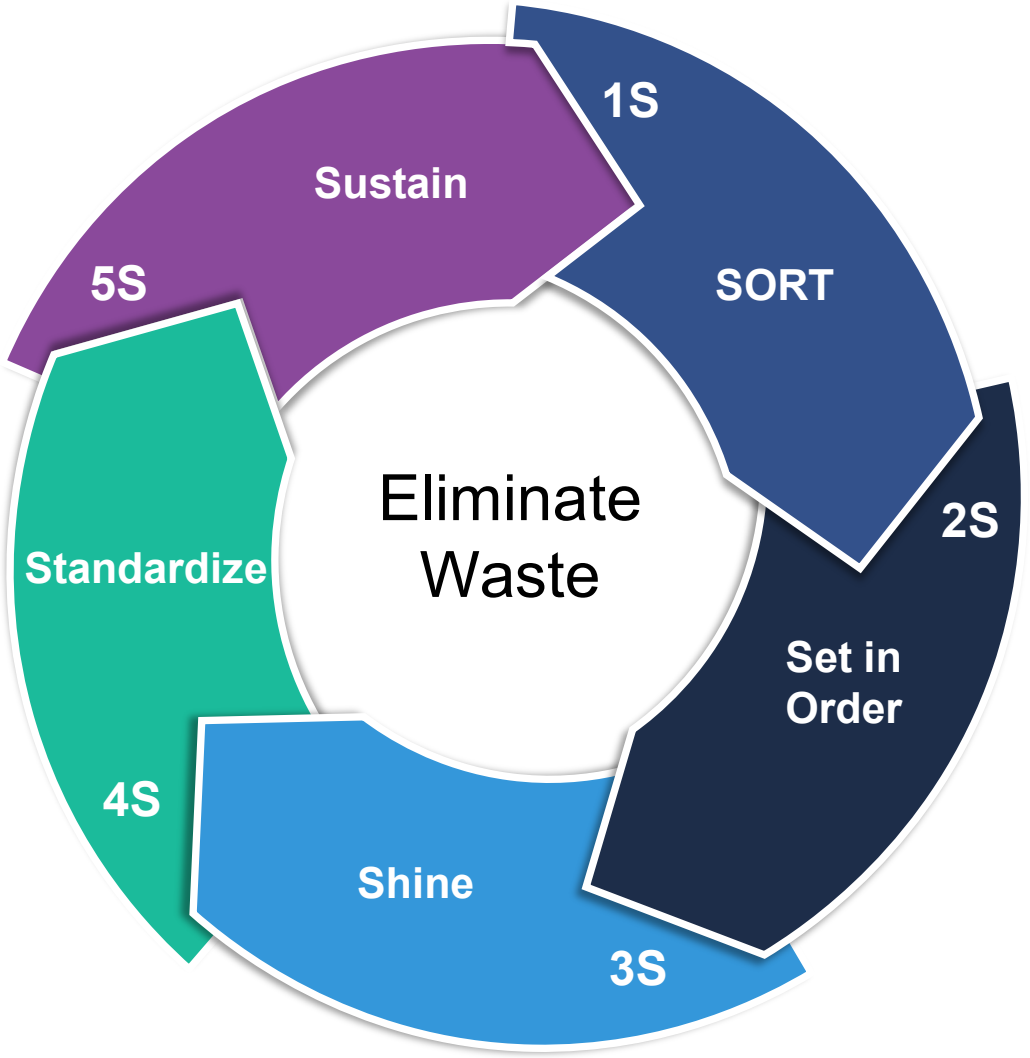
What are the barriers to implementing 5S?



5S and Continuous Improvement

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What is continuous improvement?

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A systematic ongoing effort to improve processes

Get better and better at moving the canoe down the river

Continuous

- Ongoing
- Never ending
- Always looking to improve and a process to do it

Improvement

- Improve what?
- Reduce waste
- Improve flow

Continuous Improvement Mindset

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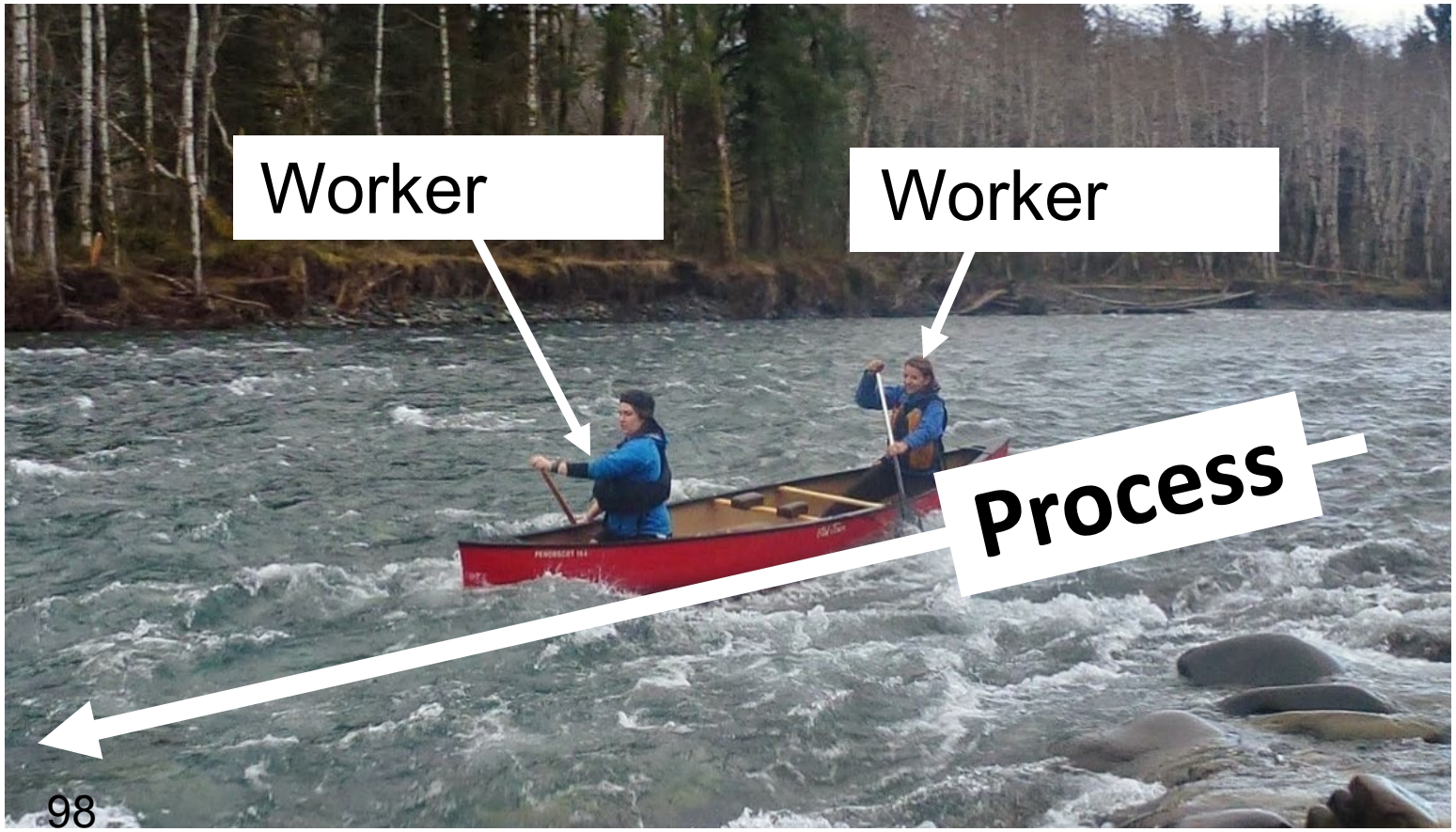
My Job = Doing the Work

+ Improving the Work



…Everyone, Every Day!

5S Assessment

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Implementing Improvements

Template for conducting a 5S Assessment

Take out your 5S Assessment Form and get ready.

5S ASSESSMENT – Page 2

From what you observed on your assessment walk… What can be improved?

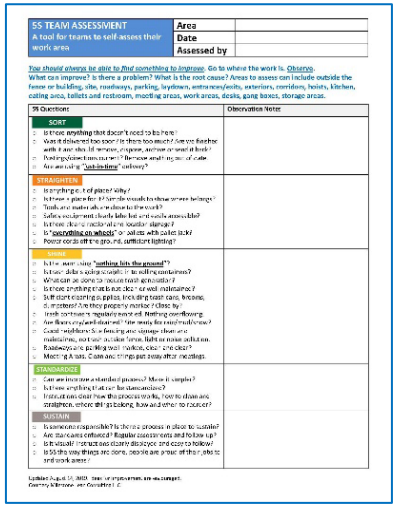
(1) Understand what is the real problem or issue. Get to the root cause.
(2) How do we avoid repeating it? What can we do differently to improve?
(3) Implement the change. Check improvement and adjust as needed.
(4) Share the improvement. Make it the standard.

Areas for improvement (Key items from your observation notes)	What will we do about it? Who will follow-up?
From your notes on the front, summarize the key points: What is the problem and root cause? What is the idea for improvement?	*What steps will we follow to implement the improvement. Who will be responsible? How will be document and share it?*

Virtual 5S Assessment

Let's go on a virtual 5S assessment in Southland Industries' (MEP Building Systems Specialty Contractor) Northern California Shop via video.

- The videos are unscripted.
- These are real situations and issues brought up while filming.
- Some comments were re-shot for clarity.


5S TEAM ASSESSMENT
A tool for teams to self-assess their work area

Area	
Date	
Assessed by	

You should always be able to find something to improve. Go to where the work is. Observe. What can improve? Is there a problem? What is the root cause? Areas to assess can include outside the fence or building, site, roadways, parking, laydown, entrances/exits, exteriors, corridors, hoists, kitchen, ceiling area, toilets and restroom, meeting areas, work areas, desks, gang boxes, storage areas.

5S Questions	Observation Notes
SORT	
STRAIGHTEN	
SHINE	
STANDARDIZE	
SUSTAIN	

Listen to the observations of those who do the work.

What do you see that is good?

What can be improved?

Look for the root cause.

Use your 5S assessment form.

Ready? Let's Go

5S Virtual Assessment

Sheet Metal & Shipping

Look for:

- Area was a dumping ground. What is the root cause?
- How could visual management help?
- Do you think others realize they are blocking the shipping area when they drop materials?
- Who did most of the talking?
- The problem involved other departments. What did they do?
- Did they come up with a plan to address the problem?

5S Virtual Assessment

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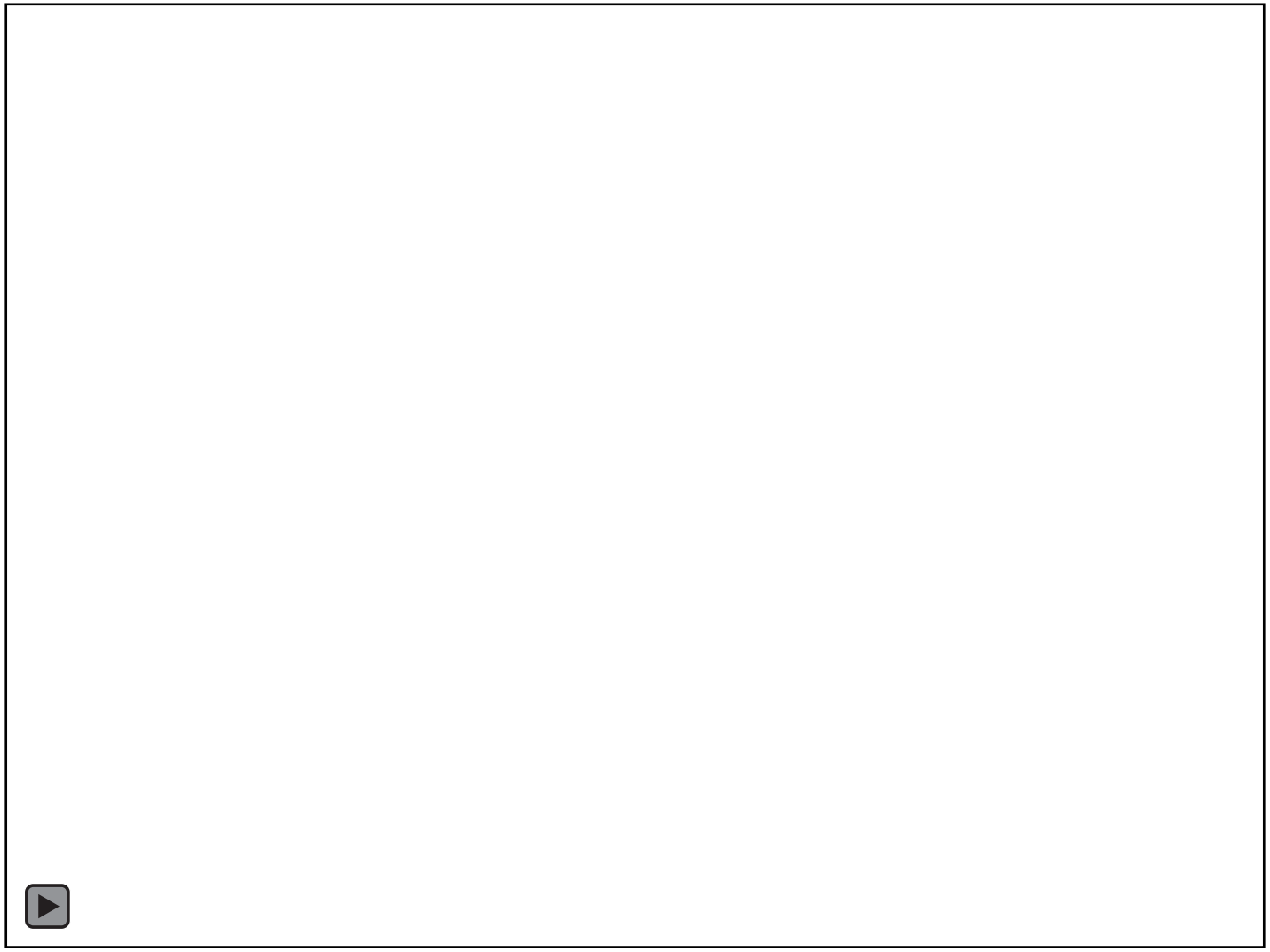

5S Virtual Assessment

Sheet Metal & Shipping

What did you see?

- Area was a dumping ground. What is the root cause?
- How could visual management help?
- Do you think others realize they are blocking the shipping area when they drop materials?
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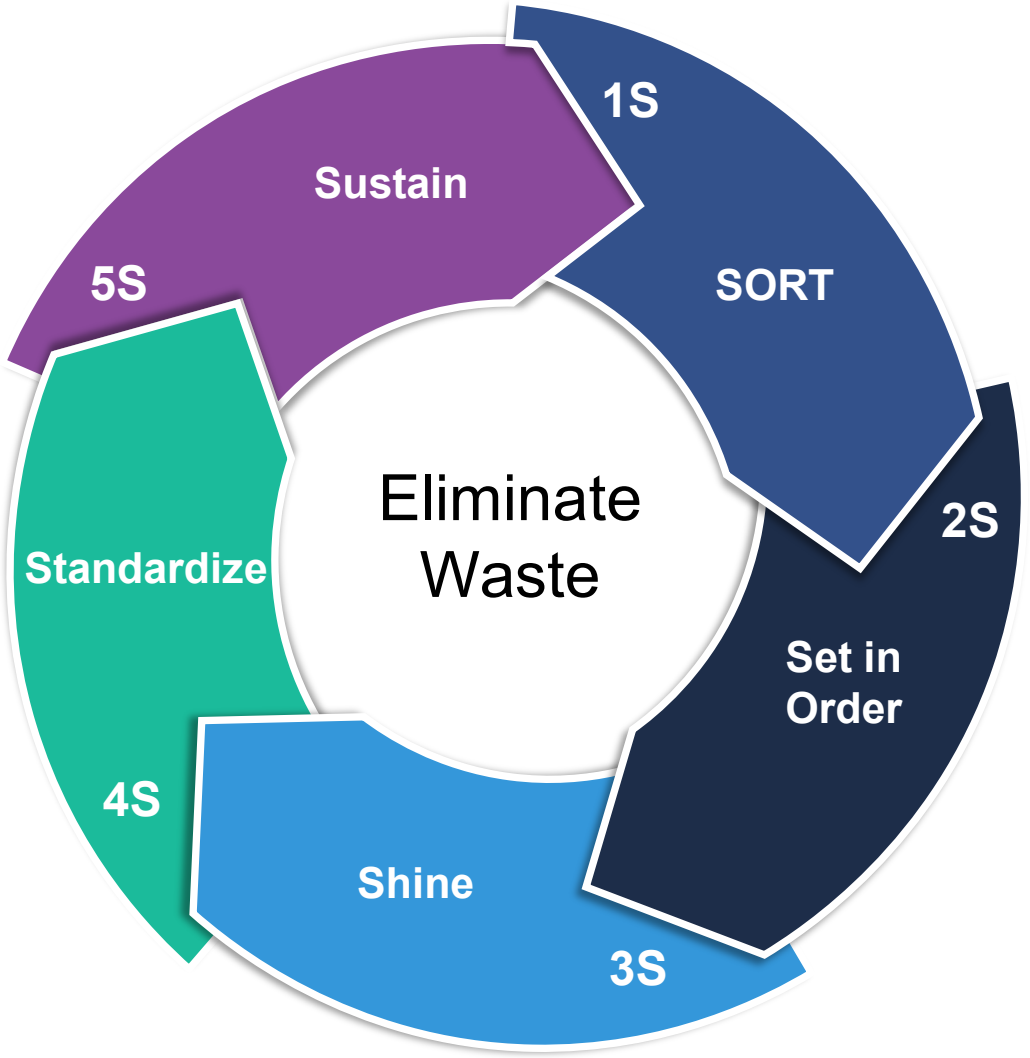
5S Levels of Achievement



5S Levels of Achievement

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Low → High

BASICS

CONTROL

RELIABILITY

PREVENTION

- Items identified and removed
- Organized by frequency
- Inspection/ documentation
- Organization visuals
- Activity documentation

STRATEGIC 5S Program:

- Project lifecycle planning
- Stakeholder alignment
- Procurement Takt™
- CI practiced
- Lived by leaders

5S Levels of Achievement

Lean Construction Institute
Immersive Education Program

Low → High

BASICS

Items identified and removed
Organized by frequency
Inspection/ documentation
Organization visuals
Activity documentation

CONTROL

Active 5S Plan management
Problem areas identified with plan
Workplace visuals
Contract language

RELIABILITY

PREVENTION

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Lean Construction Institute
Immersive Education Program

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RELIABILITY
- 30sec Rule
- Documented responsibilities and schedule
- Inspection integrated with cleaning
- Standard methods used across team

PREVENTION

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Lean Construction Institute
Immersive Education Program

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- Workplace visuals
- Contract language

RELIABILITY
- 30sec Rule
- Documented responsibilities and schedule
- Inspection integrated with cleaning
- Standard methods used across team

PREVENTION
- Project lifecycle planning
- Stakeholder engagement
- Countermeasures are used prior to problems
- RCA practiced

STRATEGIC 5S Program:
- Project lifecycle planning
- Stakeholder alignment
- Procurement Takt™
- CI practiced
- Lived by leaders

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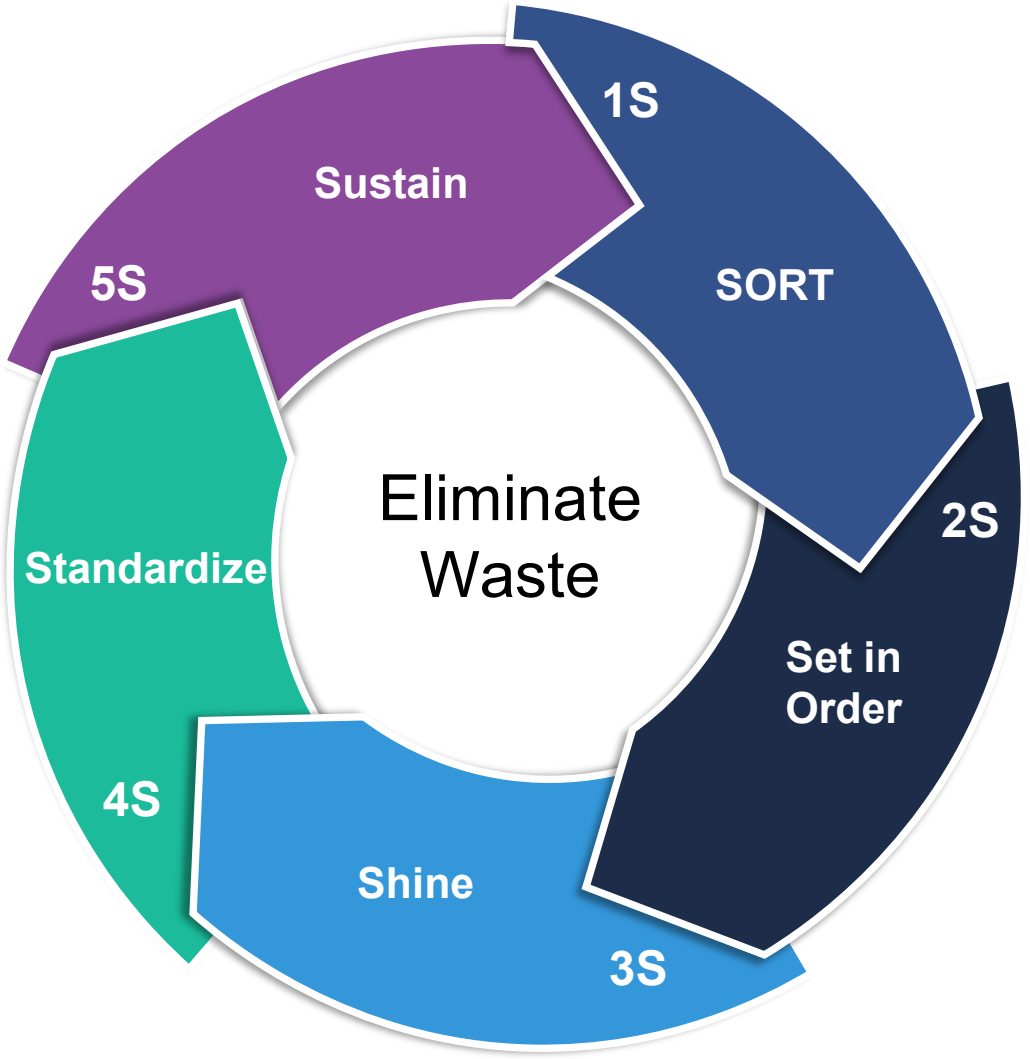
Build a Truck

Let's explore the impact of 5S!



Build a Truck

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These parts represent pieces to assemble into a roadwork truck.

Our job during a 40 second shift is to build the entire truck.

When I say *"Go"*, start assembling.

Play – Round 1

40

STOP!

30

This was designed for kids four and up…

20

10

5S Numbers Game – Round 2

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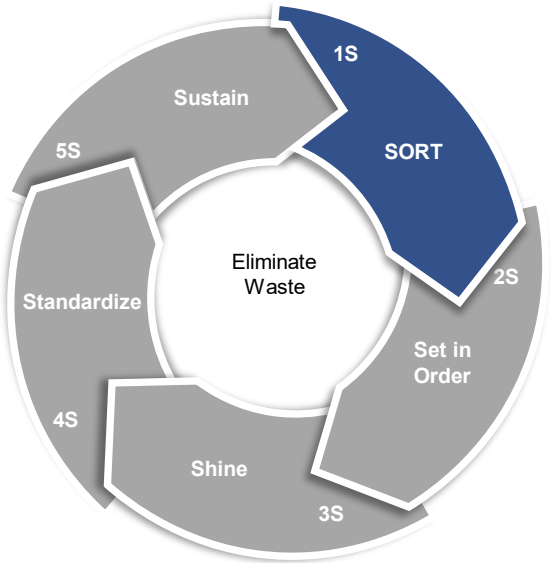
Who finished the worker?

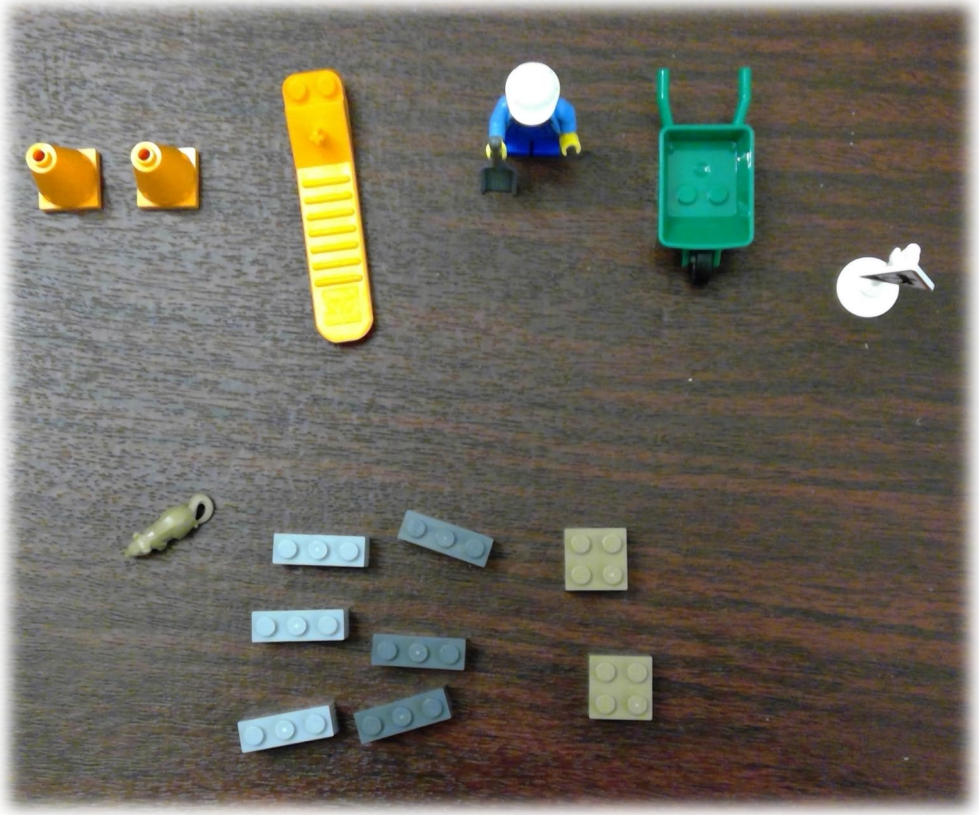
Who started the truck?

Let's *implement Sort* for this next exercise!

Remove the waste pieces; use the picture for reference.

40 seconds on the clock… When I say *"Go"*, start assembling.





Play – Round 2

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Immersive Education Program

40

30

20

10

STOP!

5S Numbers Game – Round 3

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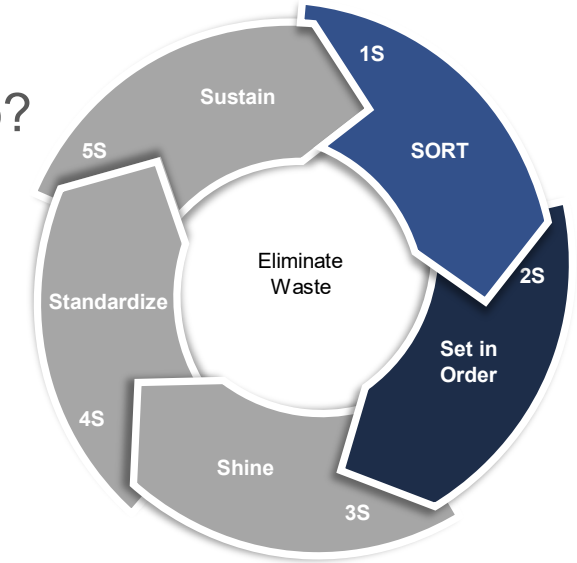
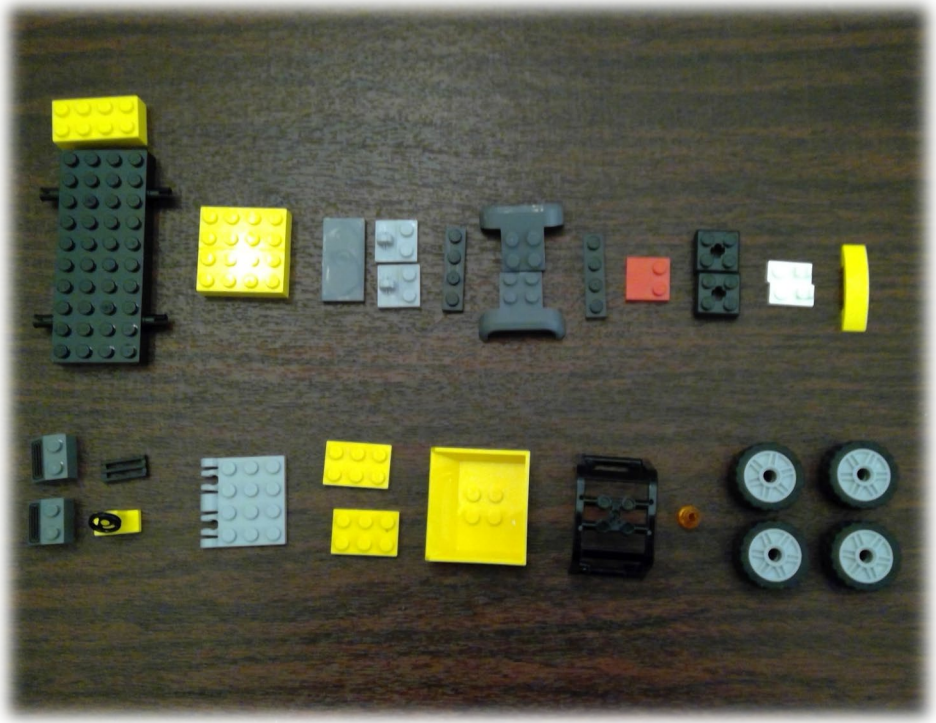
Immersive Education Program

Hold up your truck. How did we do?



Use the orange separator tool to disassemble the pieces. Let's *implement Set in Order* and try again!



Look at the picture and instructions and set the pieces in order.

40 seconds on the clock… When I say *"Go"*, start assembling.

Play – Round 3

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40

30

20

10

STOP!

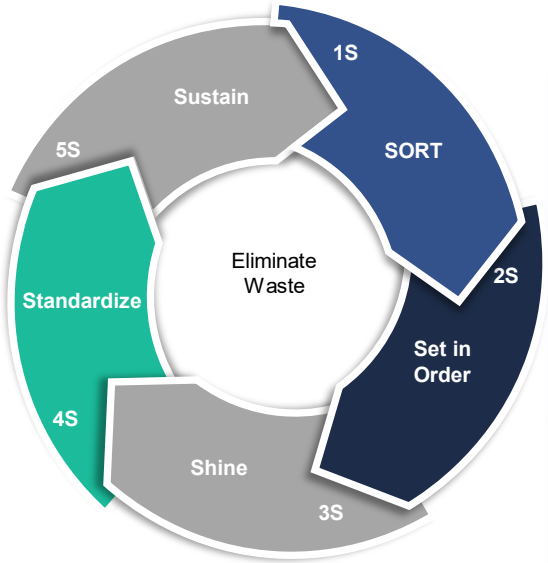
5S Numbers Game – Round 4

How far did we get this time?

Use the orange separator tool to disassemble the pieces. Let's *implement Standardize*.

What can we do to *Standardize*?

Any ideas?



5S Numbers Game – Round 4

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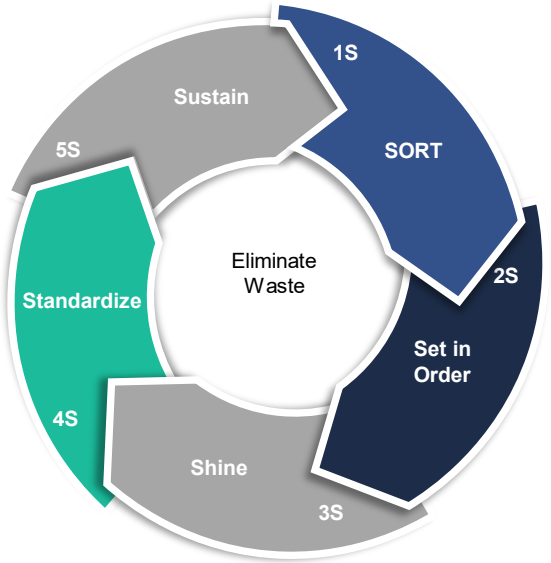
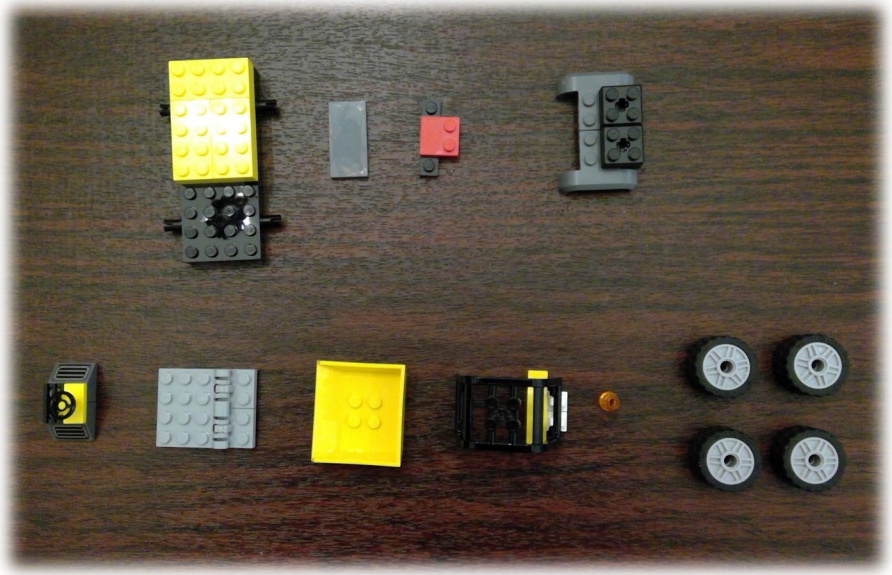
Modularization?

Take a few minutes, modularize up to 4 pieces, and any other standardize idea you had.

Let's try again, ready…





Play – Round 4

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40

STOP!

How did everyone do?

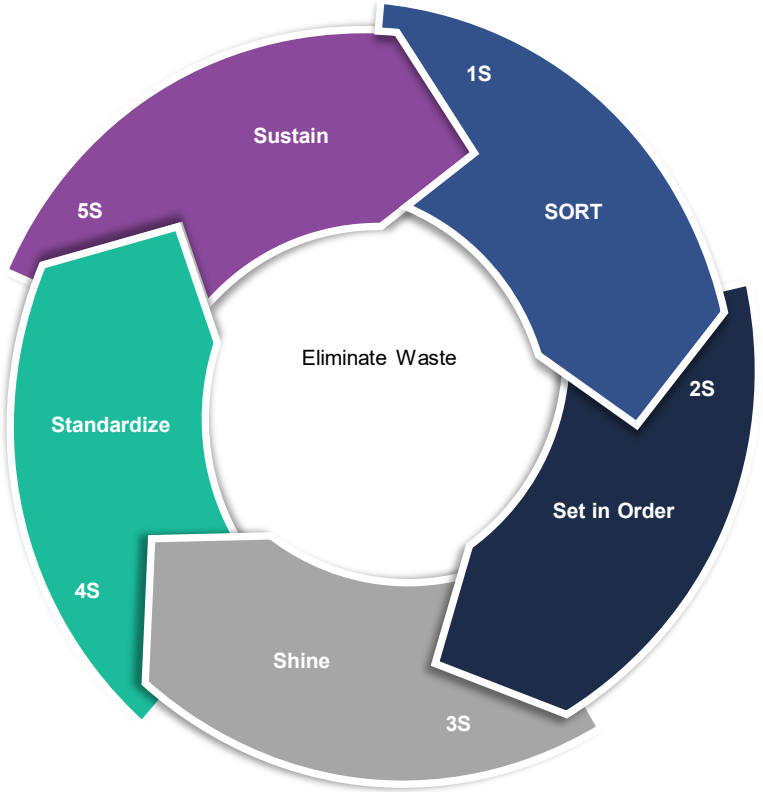
30

How does this simple exercise apply to the field?

20

How do we apply sustain to this model? Can offsite fabrication be sustained?

10



5S Numbers Game – Round 5

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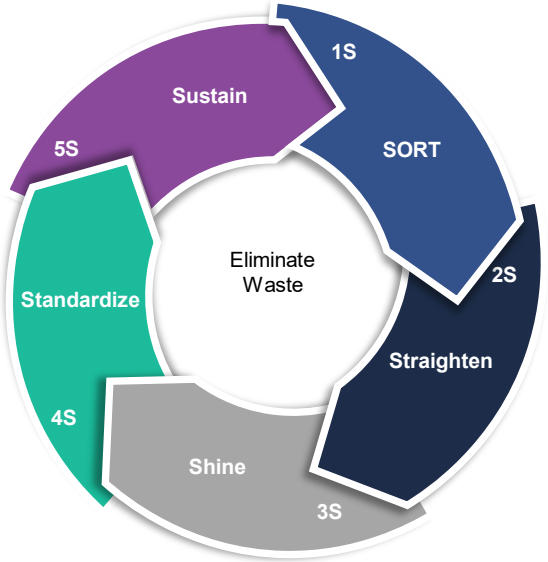
How far did we get this time?

Use the orange separator tool to disassemble the pieces. Let's *implement Sustain*.

Modularize your pieces and pass them to another team.



Play – Round 5

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40

STOP!

How did everyone do?

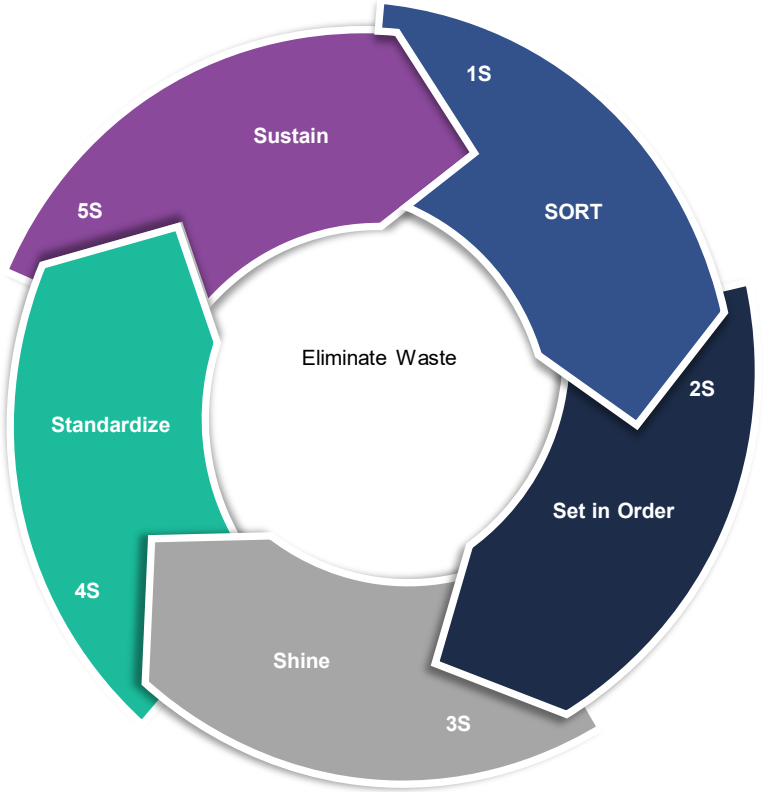
30

How does this simple exercise apply to the field?

20

How do we apply sustain to this model? Can offsite fabrication be sustained?

10



Discussion Question

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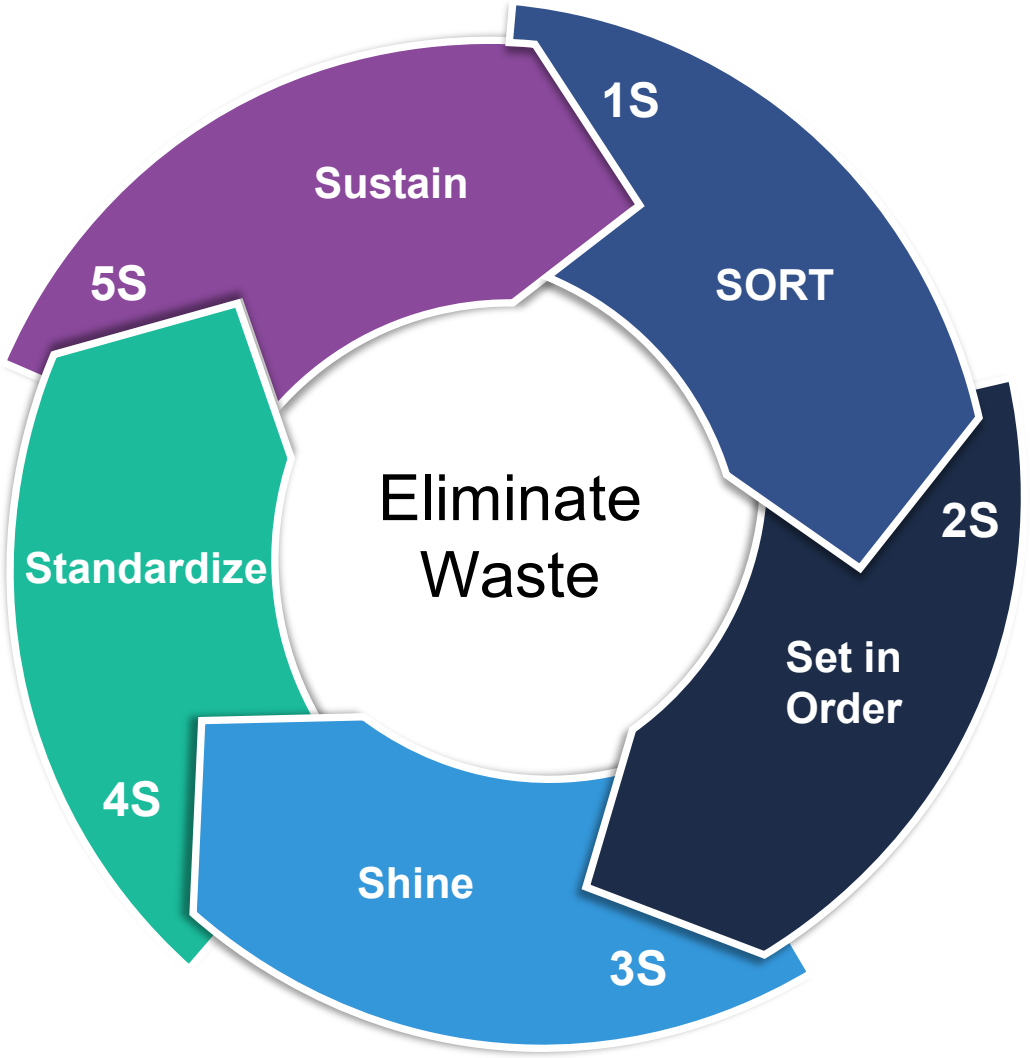
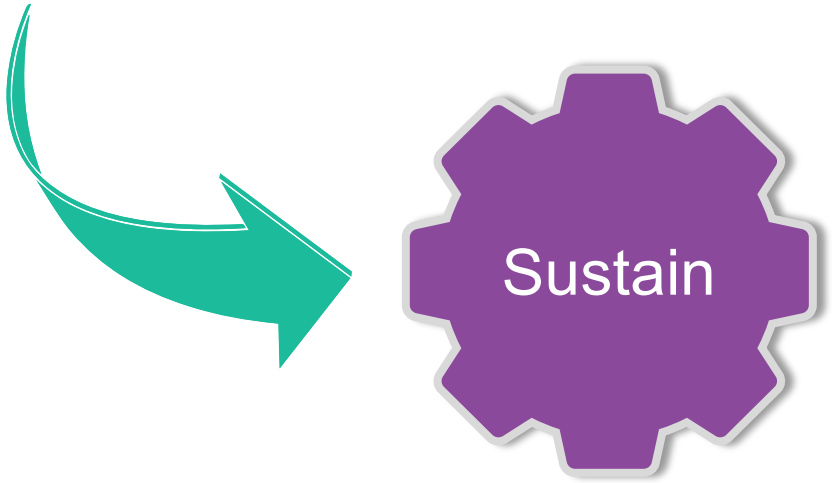
Develop an action plan for implementing 5S



5S Get Going

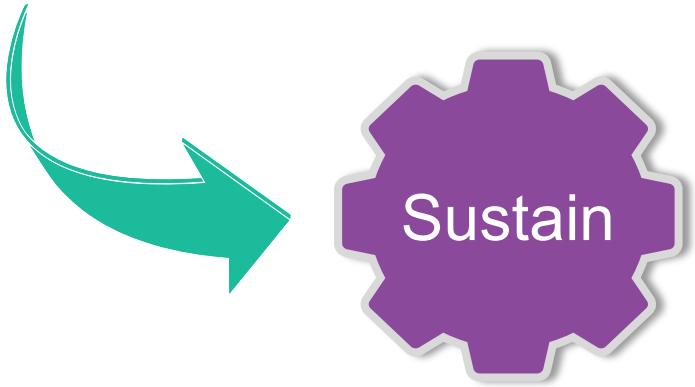
Involve the entire project team



- Get management buy-in and participation
- Establish a shared vision: see the gaps!
- Include 5S in subcontracts
- Involve safety team to think 5S
- If this is your first time, use a coach

5S Get Going

Learn by doing



- Get 5S training for the team
- Include 5S in onboarding
- Try something

5S What keeps it going?

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The best teacher for 5S is "learning by doing"

Provide coaching in the field to see waste and remove it.

- Managers must learn the 5S principles and process to properly lead
- Basic training is enough for most staff to get started
- Learn to see waste, see when flow stops, find the root cause
- Practice implementing improvements and checking if they work

5S What keeps it going?

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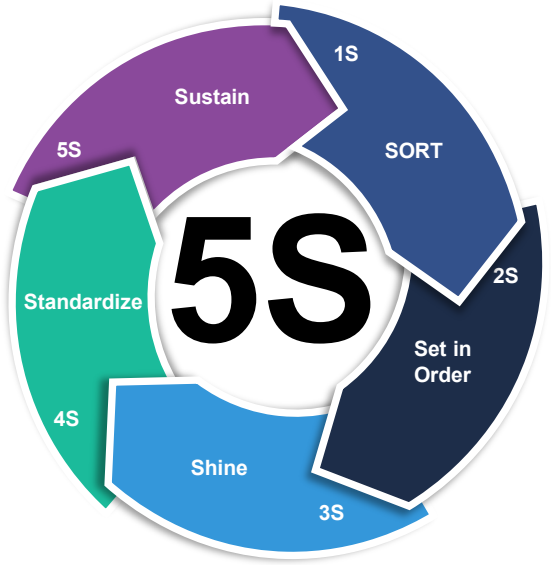
5S is a gateway to more Lean improvements and a key method to build a culture of Lean thinkers



- Staff learns how to think in terms of value and waste
- Builds a culture of respect
- An organization of problem solvers
- Managers learn how to be Lean leaders

RESULTS

- **Employee engagement**
- **Customer satisfaction**
- **Less problems**
- **Safer workplace**
- **Lower costs**
- **Higher profit**

Improves productivity, safety, quality, employee satisfaction

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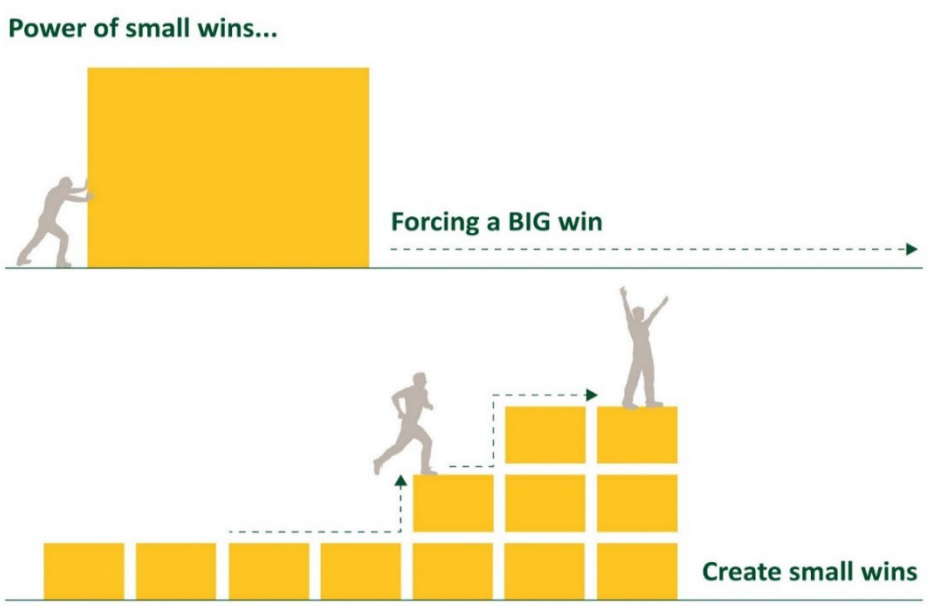
5S What keeps it going?

- Encourage growth - don’t force growth
- It is not a program - it is the way we work
- Keep it simple - don’t add bureaucracy
- Step by step you will get there



5S What keeps it going?

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If for no other reason…

5S builds behaviors and practices that make us safer.

Process: Housekeeping Safety

Good housekeeping not only results in a cleaner workplace but makes it safer as well.

Good housekeeping reduces illnesses and injuries and promotes positive behaviors, habits, and attitudes.

Discussion Question

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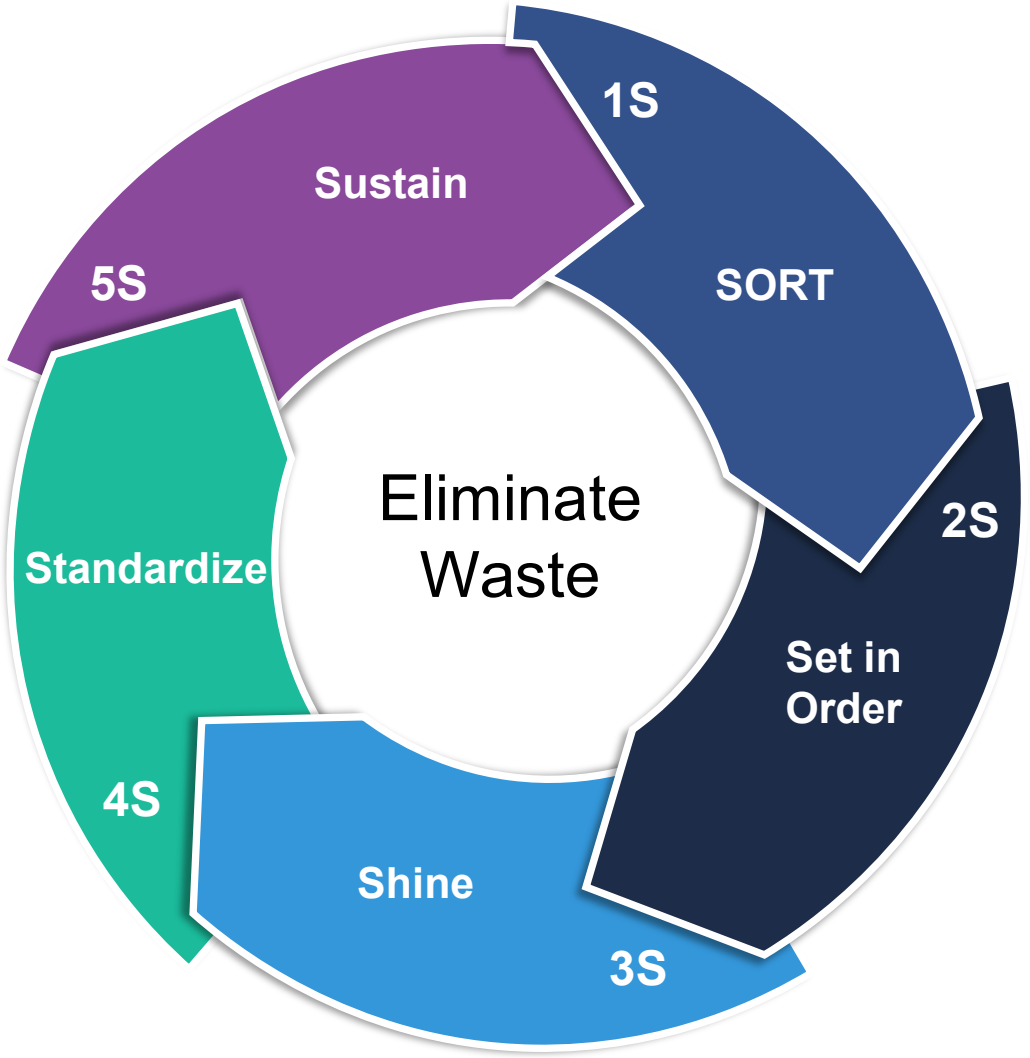
What are your key take-aways from this session?



Learning Objectives

- Understand and be able to identify the 5Ss supported by real project examples.
- Understand how to implement key Lean approaches to support sustaining 5S on a jobsite.
- Identify areas in your work that would benefit from 5S application.
- Discover ways to build consensus and support for 5S with your team.

Lean Journey to Mastery

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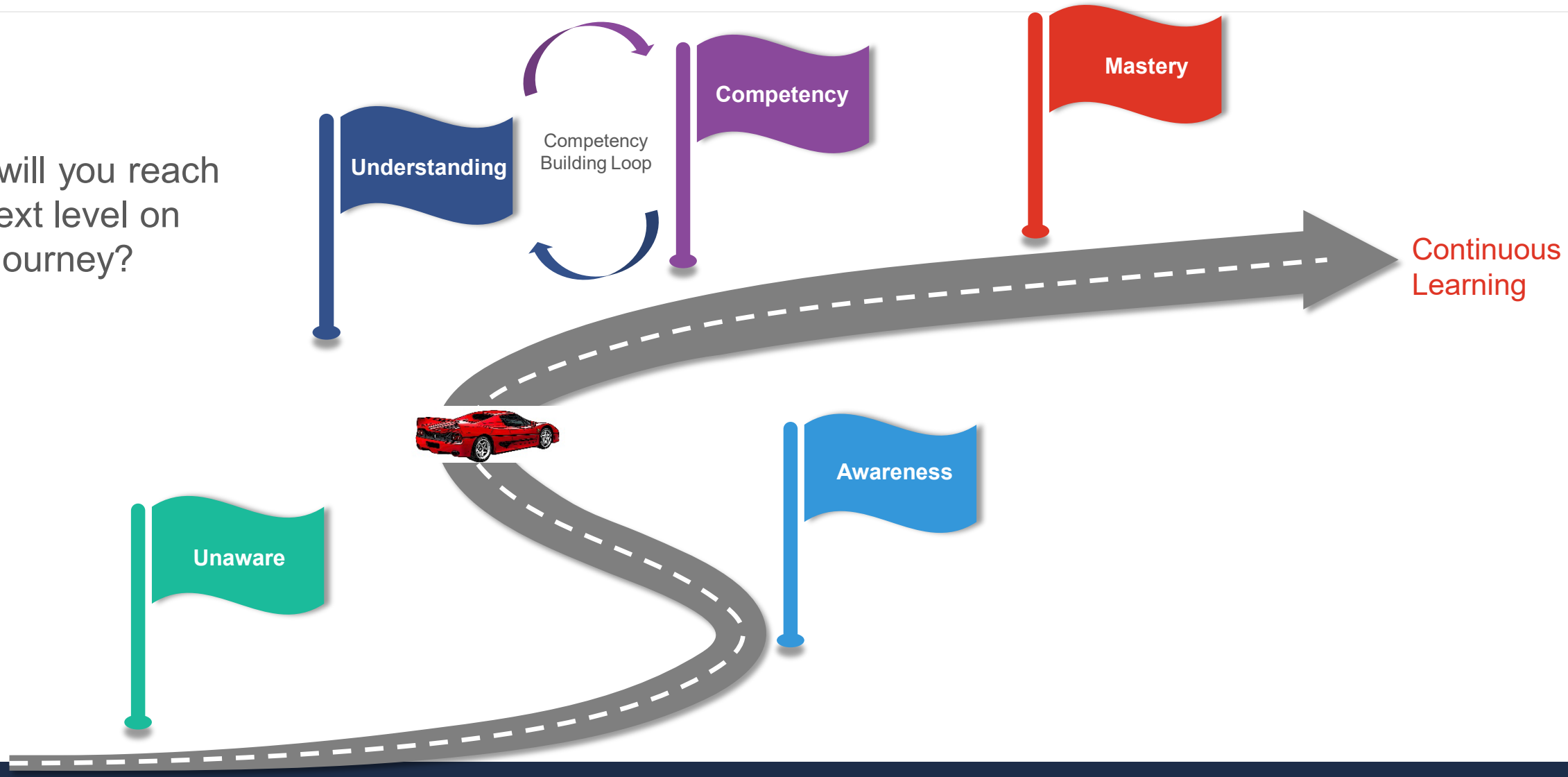
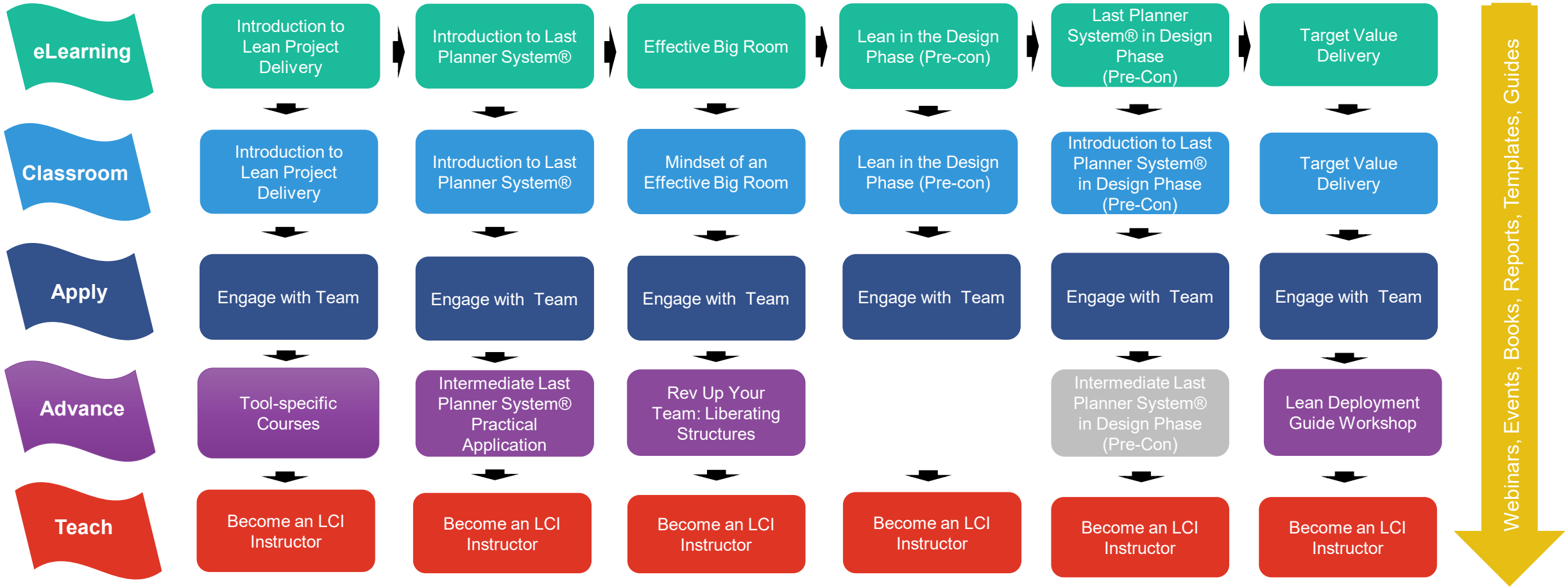
How will you reach the next level on your journey?



Define Your Journey



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LCI Certification

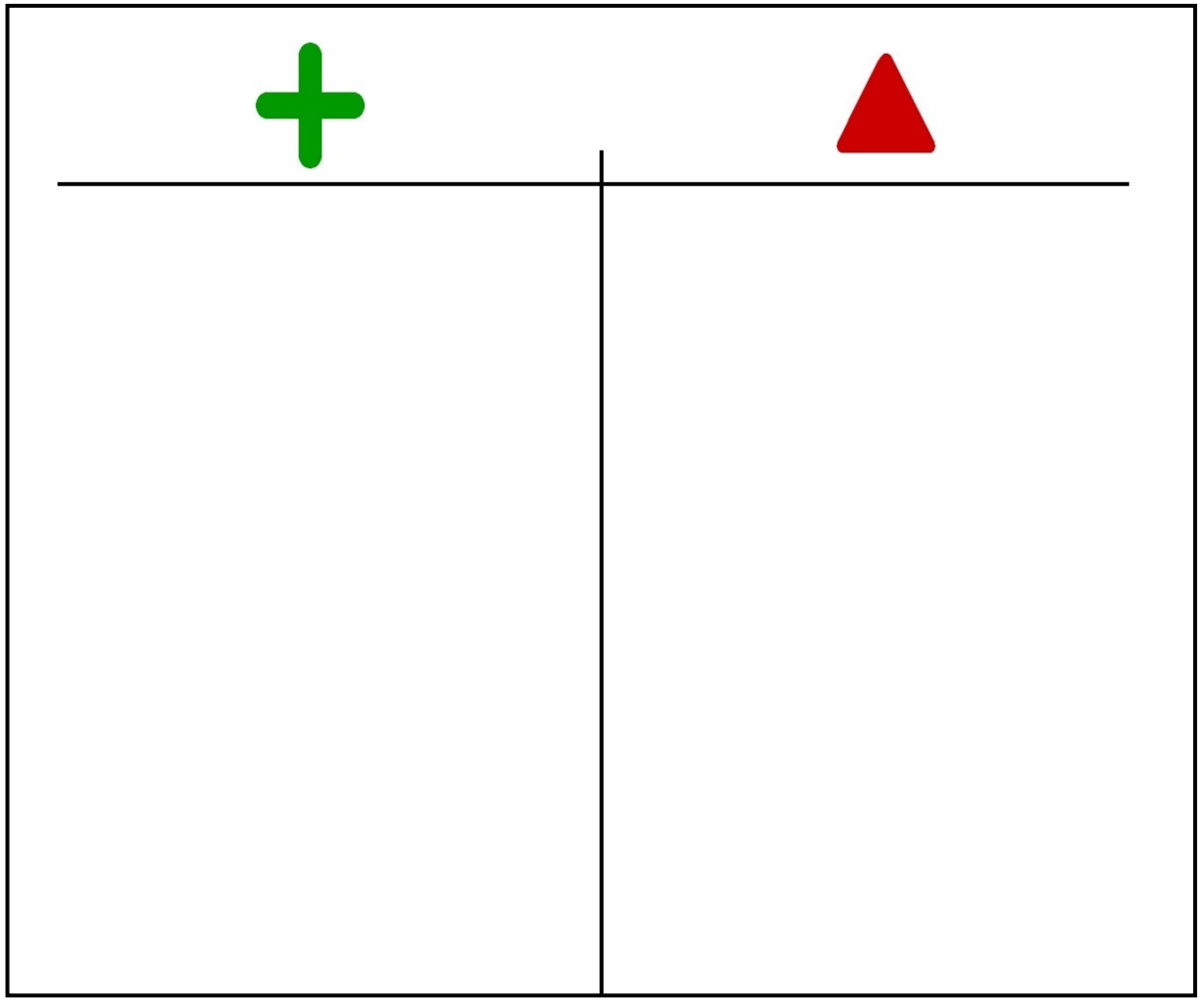
https://leanconstruction.org/lean-certification/

Questions?

Conduct Plus/Delta

Plus: What produced *value* during the session?

Delta: What could we *change to improve* the process or outcome?



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