



# Problem Solving- A Companion to TWI

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# Why Problem Solving?

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- The TWI “J” programs uncover problems
  - Ineffective training
  - Breaking down jobs to find waste and opportunity for improvement
  - Handling people issues

# Workshop Agenda

## The Four Step Problem Solving Method

- **Day One: *Step One- Find and Clarify a Problem***
  - Intro to Problem Solving
  - The A3 Report
  - Problem Identification and establishing goals
  - Homework Assignment
- **Day Two: *Step Two-Find the Root Cause***
  - The Scientific Method
  - Brainstorming
  - Analyzing Data
  - The Five Why process
  - Homework Assignment
- **Day Three: *Steps Three and Four-Identify and Implement Countermeasures, and Follow up***
  - Identifying and Evaluating Countermeasures
  - Developing an Implementation Plan
  - Process Confirmation and Follow Up
  - Report out and wrap up



# The Four Step Process

- **Step One: *Find and Clarify the Problem***
  - Understand the current situation
  - Set standards as the foundation for PPS
  - Surface the problems
  - Build consensus and alignment
  - Clarify goals and targets
- **Step Two: *Find the Root Causes***
  - Ask clarifying questions (when, where, how)
  - Narrow the focus
  - Brainstorm possible causes
  - Determine the most likely contributors
  - Determine the greatest actual contributors
  - Confirm the root causes

# The Four Step Process

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- **Step Three: *Identify and Implement Countermeasures***
  - Brainstorm countermeasures
  - Evaluate and prioritize countermeasures
  - Develop the Implementation Plan
- **Step Four: *Confirm and Follow Up***
  - Verify plan effectiveness
  - Modify implementation plan
  - Confirm the results
  - Standardize effective countermeasures
  - Develop Future Steps

# Why are we here?

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- 1. Recognize the importance of *Practical Problem Solving*.**
  - Purpose
  - Process
  - Payoff
- 2. Skills development: learn the Practical Problem Solving Process!**
- 3. Any others??**

# Kaizen Bridge

## Goal: Score the most points

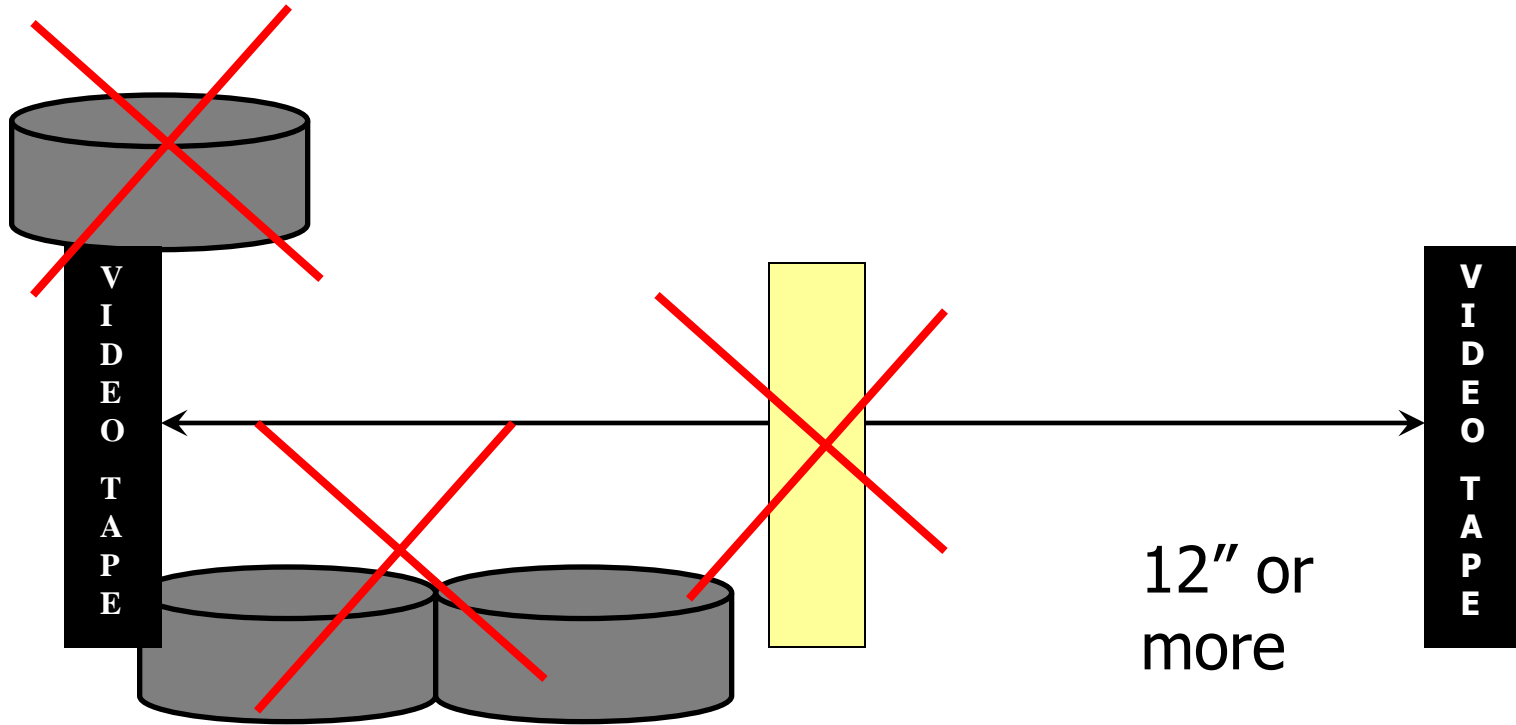
- Scoring: 100 Total Points
  - *10 Points per puck*
- Deduct 5 points for every item used
- Deduct 2 points for each inch of tape used
- Deduct 2 points per second of assembly time
  - *Sub assembly is allowed without deduction*
- If two people used for assembly the deduction is double

# Kaizen Bridge

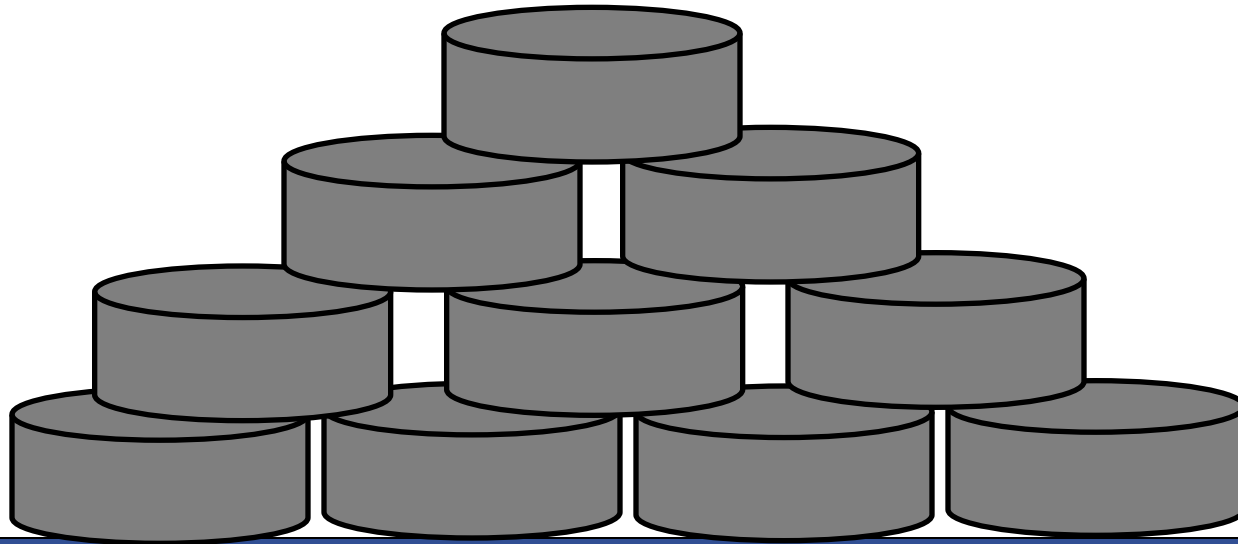
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- Rules: Bridge must be more than 12 inches between the tapes
- Span must support pucks (no middle post)
- Pucks must not be over the video tapes
- Video tapes on edges only (not flat)
- Must support for 5 seconds
- **THERE MUST BE AN ACTUAL BRIDGE!  
PUCKS CAN NOT TOUCH THE TABLE OR ANY  
MATERIAL OTHER THAN THOSE GIVEN!**

# Kaizen Bridge



# Kaizen Bridge



Must be a structure to support pucks!



**12.25" or more**

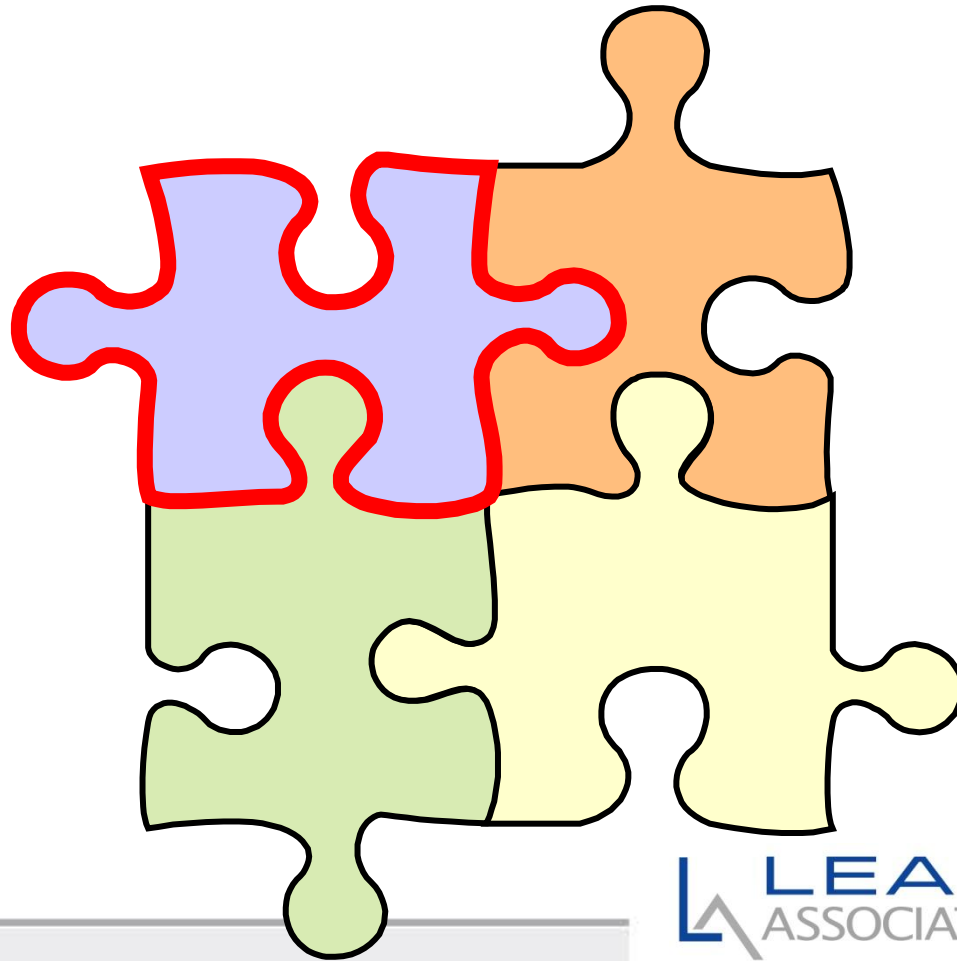


# Review

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- What happened?
- What happened the way you planned?
- What did not happen the way you planned?
- Did you get stuck?
- What did you learn?

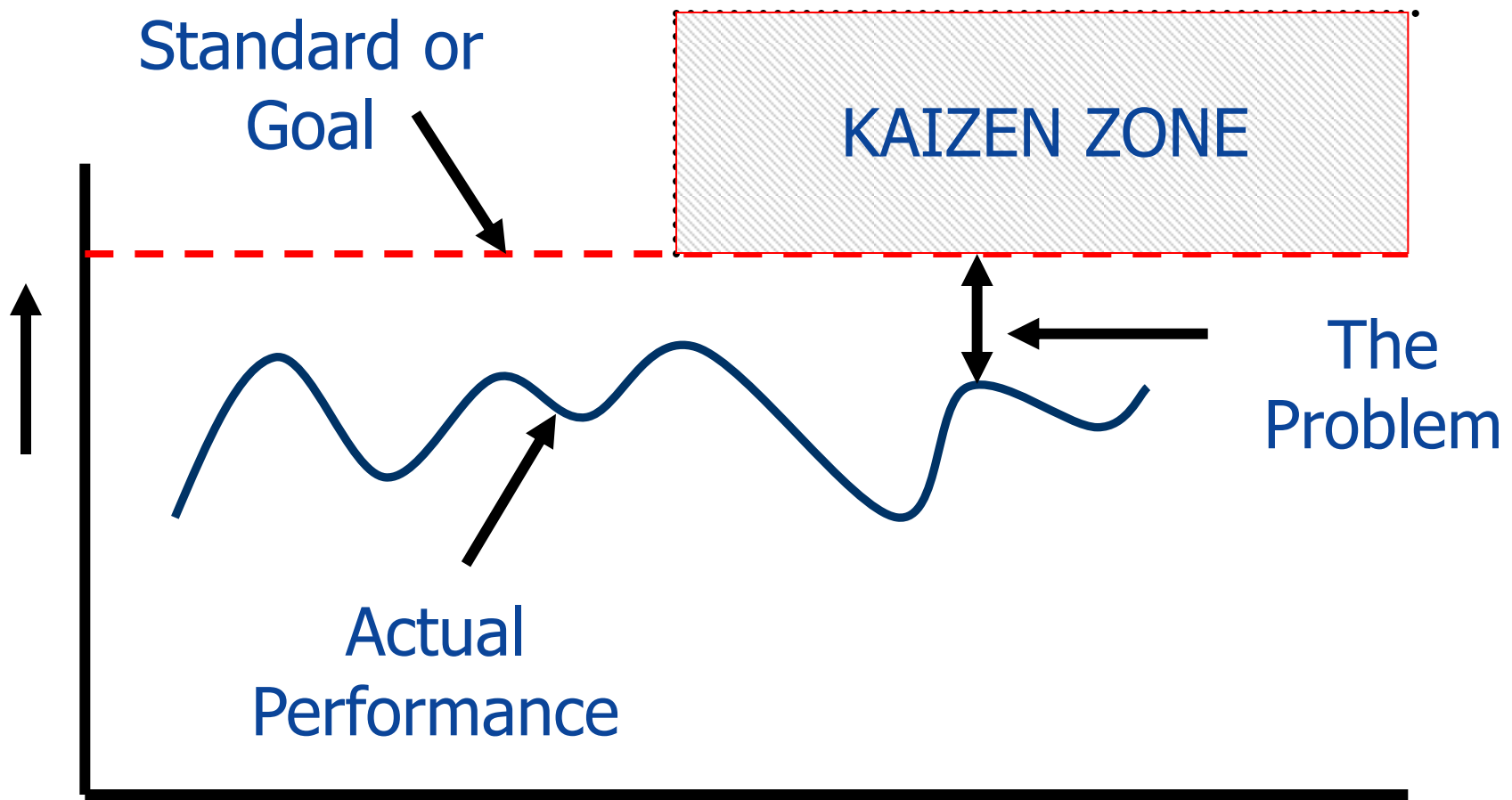
# Step 1: Find and Clarify The Problem



# Junk Words

- It is a long way to the store  
*How many blocks? \_\_\_\_\_*
- There are a lot of people waiting in line at Wal-Mart.  
*How many people in line? \_\_\_\_\_*
- There are a lot of mistakes.  
*How many mistakes are there? \_\_\_\_\_*
- It takes a lot of work to do lean activities.  
*How many hours does it take each week? \_\_\_\_\_*
- We have a big problem with defects.  
*How many defects is that? \_\_\_\_\_*
- These things take too much time to do.  
*How much time do these things take per day? \_\_\_\_\_*

# Problem or Opportunity: What do we do?



Problems MUST be corrected

Kaizen is opportunity for improvement

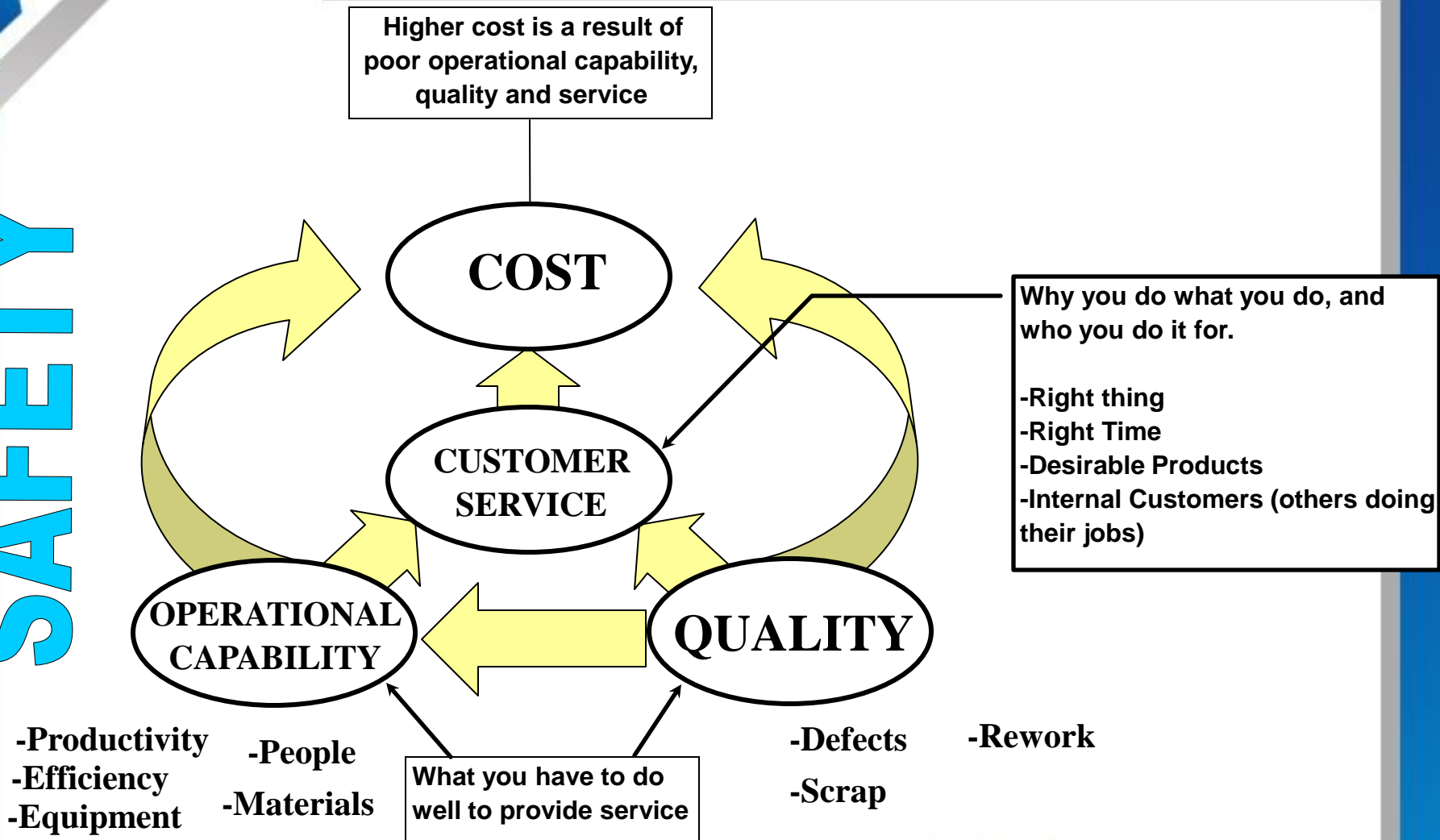
# Criteria for Problem Definition

*What do we need for a problem to exist?*

1. An Actual “Current Situation”
2. A Desired Situation (Goal or Standard)
3. A Gap between actual situation and goal
4. Extent of the problem
  - How long has the condition existed?
  - Is it getting better or worse?
  - What are the characteristics?  
(Consistent/Variable)

# Problem Relationships

**SAFETY**



# Build Consensus and Alignment: Team Exercise Part Two

- Complete the Problem Statement (section 1) of the A3
- Make sure you can verify the four criteria.
- List the rationale for solving the problem.
- List any other issues related to the problem.
- 20 minutes

# Kaizen Game Part 2

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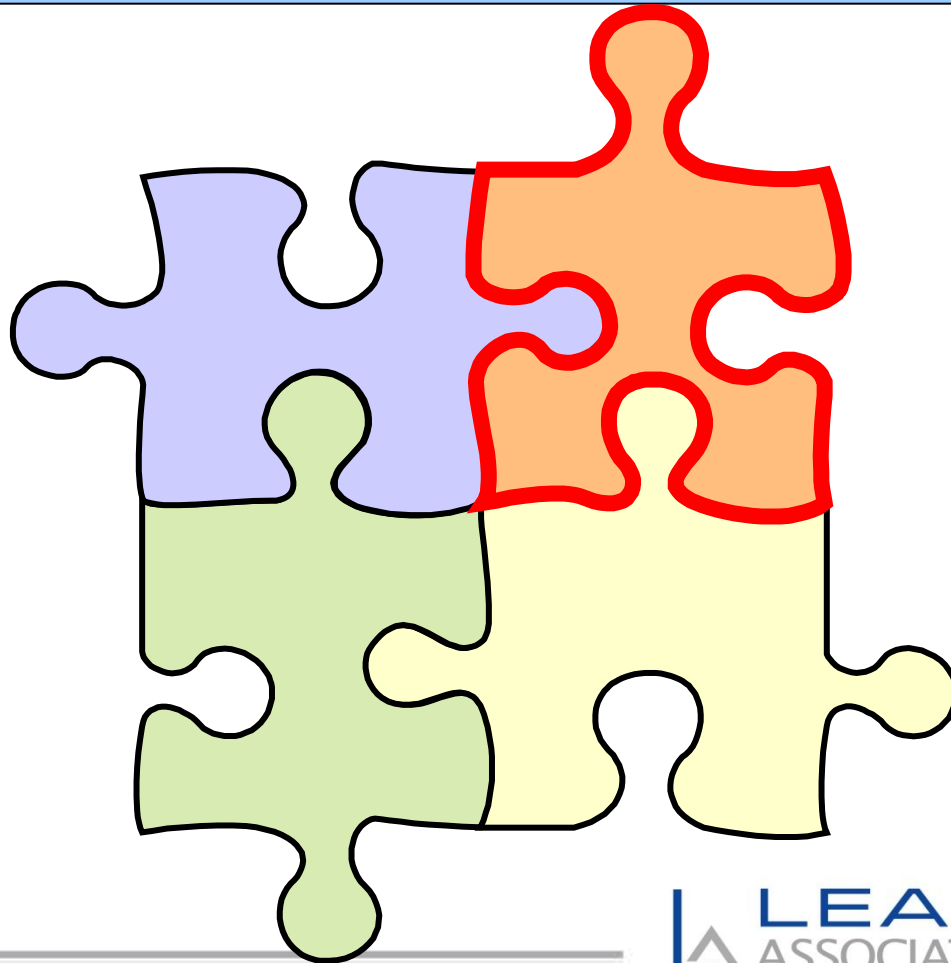
- World Class is 87
- This is more difficult, so take 15 minutes to think of how to achieve the goal
- I hope you do better this time!

# Review

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- What happened?
- What happened the way you planned?
- What did not happen the way you planned?
- Did you get stuck?
- What did you learn?

# Step Two: Finding the Root Cause

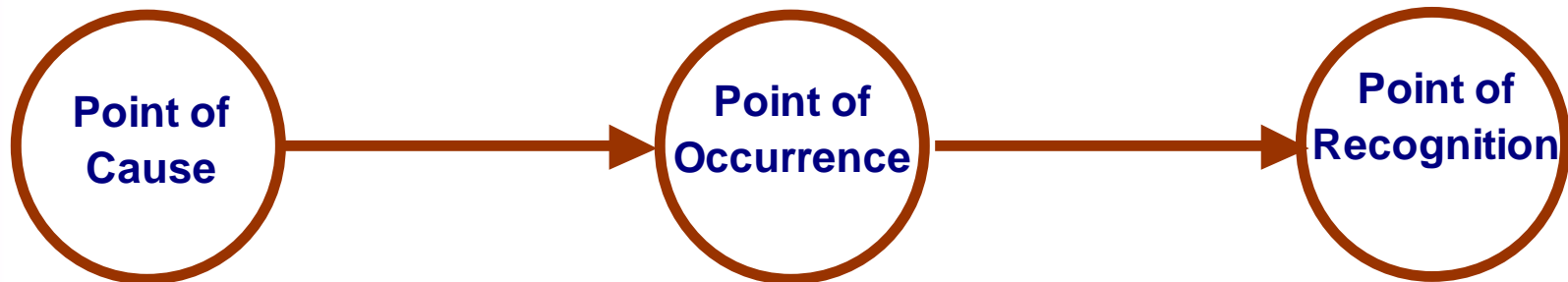


# Steps to finding the Root Causes of a Problem

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1. Ask Clarifying Questions: What, when, where or how the problem happens
2. Narrow the focus
3. Brainstorm Possible Causes
4. Determine Most Likely Contributors  
(develop your theory)
5. Determine Greatest Actual Contributors  
(conduct your experiment)
6. Confirm the Root Cause.

# Ask Clarifying Questions: Where to Look for Root Causes



**The Point of Cause may not be at the Point of Occurrence**

**Where the problem physically occurs**

**The problem is often detected at a later time. The worst is when it is at the customer.**

# Case Example: Confirm the Root Cause

**Defect Rate in Powder Paint**

**Paint Surging (Splatter)**

**Spray Technique**

**KV Setting High**

**Air Setting High**



**Rapid Movement**



**Incorrect Setting**

**Incorrect Setting**

**Cause**

**Cause**

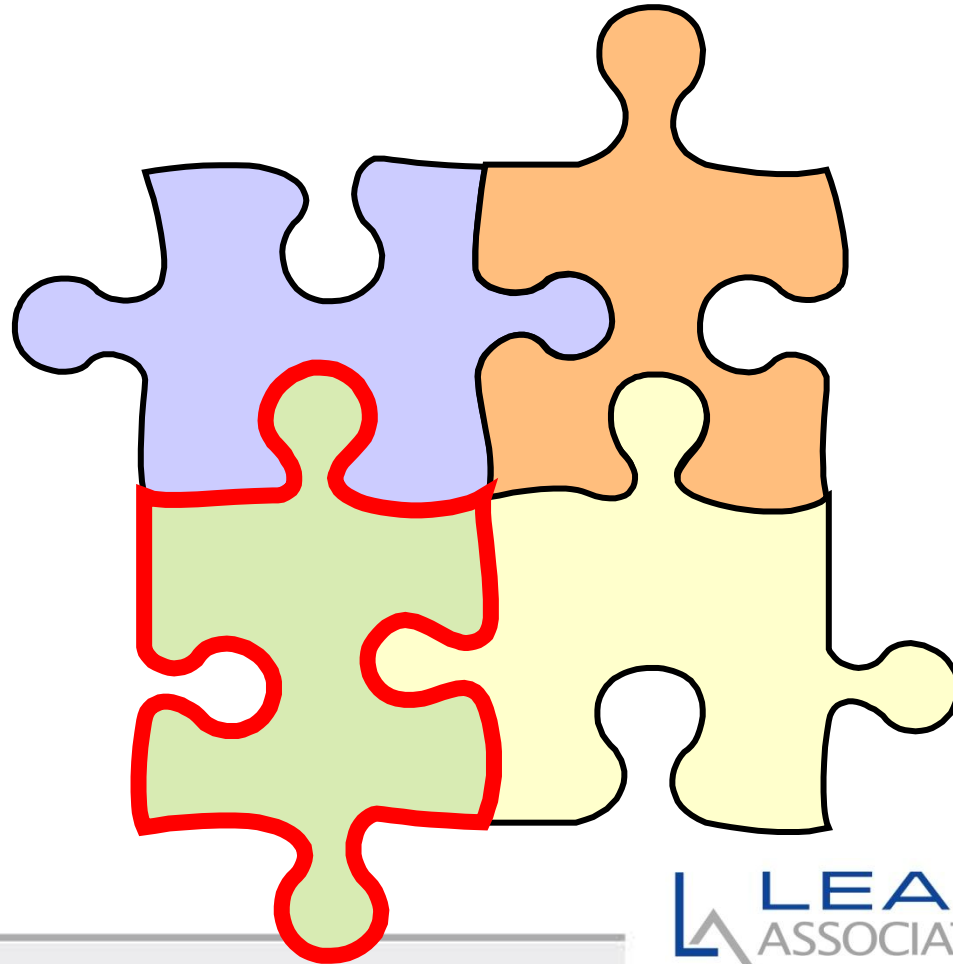
**Cause**

**Cause**

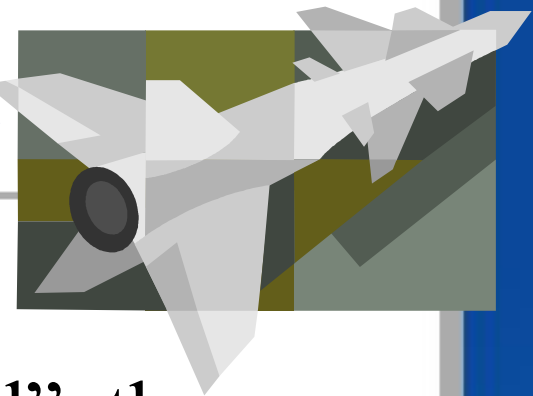
**Cause**

Keep digging to get to root causes!

# Step Three: Identify and Implement Countermeasures



# Brainstorm Countermeasures



- Problems are never truly “solved”, they are merely kept in control (minimized).
- This control is called a countermeasure.
- The countermeasure must be used constantly to control the problem and remain effective.
- Failure to use the proper countermeasure will allow for reoccurrence (defects).
- There is no “absolute” countermeasure.

# Kaizen Game Part 3

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- World Record is 98.2
- This is more difficult so take 25 minutes to think of how to achieve the goal
- Good luck! You will need it!
- (I set the record)

# Kaizen Game Review

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- Why did you get excited about this exercise?
- Why don't people get excited about improvement in the work area?
- Is it really hard to get “buy in” or “engagement”?
- What happened when the method of setting expectations changed each round? (Did the expectation **ACTUALLY** change?)

# Kaizen Review

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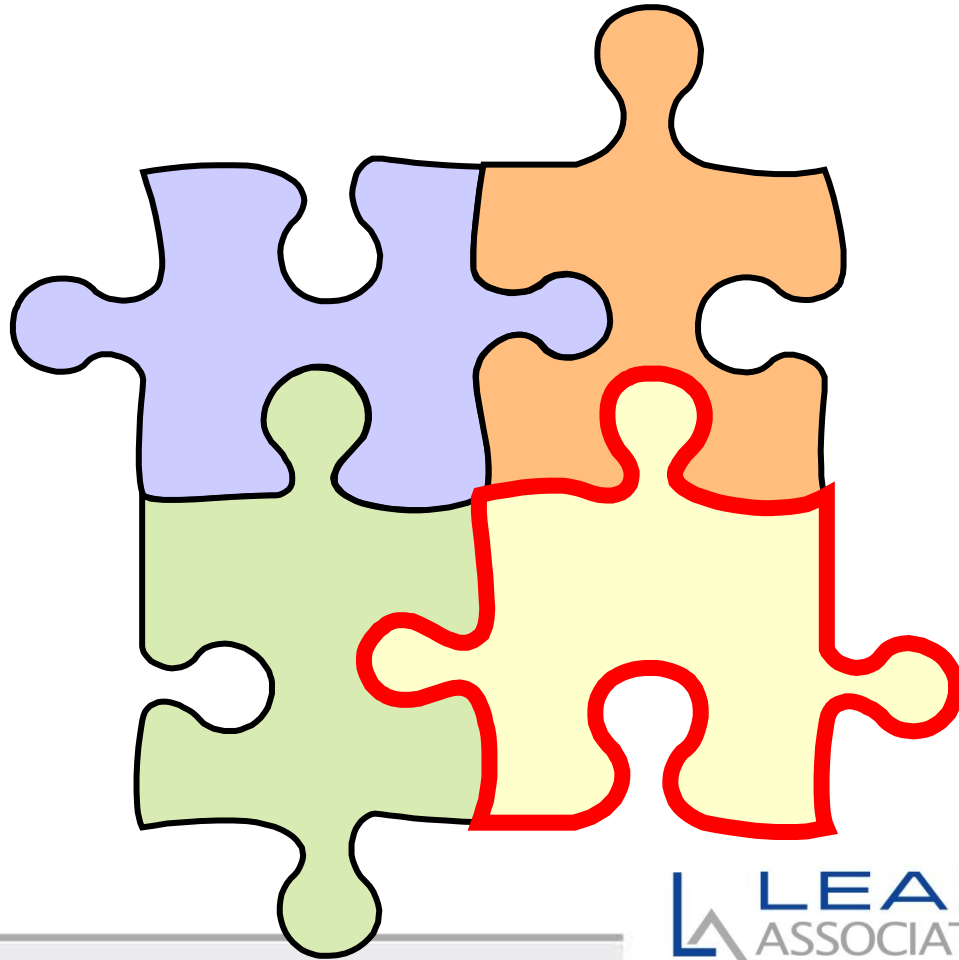
- What happened in the first round?
- Why were the scores lower?
- What happens when objectives are set this way?
  - *What is the potential risk?*
  - *What is the potential benefit?*
- What happened in the second round?
- Why was there a difference?
- What happens when objectives are set this way?
  - *Potential risks and benefits?*

# Kaizen Review

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- What happened in the third round?
- What happened to your thinking process?
- Did your brain get locked (in a box)?
- What caused the lock?
- How can we help the team get unlocked?
- Did “group think” trap you into an idea?
- How do we avoid group think?

# Step Four: Confirm and Follow Up



# Confirm the results

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- Countermeasures only control the causes of problems
- They must be constantly applied to prevent recurrence of a problem
- Countermeasures must be regularly confirmed to make sure they are still in place and being followed

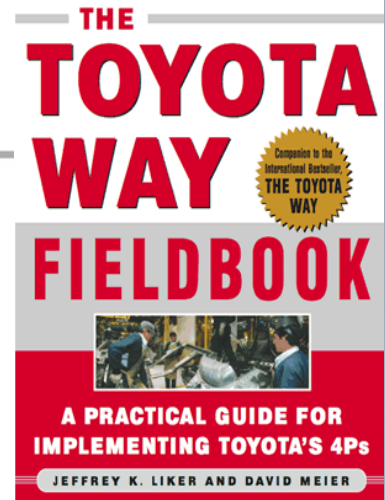


# Standardize Effective Countermeasures

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- Build countermeasures into the standard work
- Make countermeasures visual and easy to see and confirm
- Apply error proofing thinking so that countermeasures can not be omitted

# For Further Info



- Toyota Way Fieldbook  
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- [djames2@mindspring.com](mailto:djames2@mindspring.com)