# Exercises

## Lean Juggling

**Description**

Easy to facilitate, mildly physical exercise where participants define a process by passing bean bags to each other in a particular order and then brainstorm and implement ideas to improve that process.

**Purpose**

* Brainstorm process improvement ideas
* Identify ways to take time out of a process
* Demonstrate how quality is defined by the client (Value Added steps)

**Time Required**

15 min for set up and exercise

5 min debrief

**Materials (per team)**

3 bean bags and container

Stop Watch

**Participants**

6-8 per team (competition is a good thing here, 3 teams is optimal)

**Process**

1. Have participants arrange themselves in a circle
2. Place a container, just big enough to hold the bean bags, in the center
3. Throw 1 of the bean bags to a participant (remember who)
4. Ask the participant to throw the bean bag to another participant and remember who they threw it to
5. Continue until everyone has thrown and caught the bean bag
6. The last participant puts the bean bag in the container
7. Tell the participants that they have just defined the process.
8. Ask them to repeat the process by throwing the bean bag from person to person in the same order, this time add two more bean bags (throw the second bean bag to first person in the order as soon as they throw the first. Repeat for the third bean bag). Challenge the participants to complete the process as quickly as possible, timing them with the stopwatch
9. Record the ‘first run’ time on a flip chart for each team
10. Tell them they will be timed on two more runs, in ~5 and ~10 mins (they may want to do ‘practice’ runs in the mean time)
11. As the teams practice challenge them to improve the process

**Customer Requirements**

No one is to touch the bean bag more than once.

The same order must be followed

There must be no drops (defects)

The bean bag must pass through every ones hands

Cycle time <5 sec

**Debrief**

What breakthrough ideas allowed you team to improve the most?

What did you eliminate from the process?

Distance

Throwing

Catching

Flight time

**Facilitator Notes**

* You will be asked for ‘rule’ clarifications – refer to the customer requirements (this allows the group to experience the dynamics of different interpretations of quality)
* Allow the group to determine if they have met the requirements – intervene only for the most blatant violations
* Prep flip chats with:
  + Customer requirements
  + Space for the ‘run’ times in advance
  + Debrief thoughts in advance on a flip chart

## 1089 Exercise

Rules: no talking; can’t answer any questions

Set up: sheet of paper and pen, follow directions

Steps:

1. Write down a three digit number without repeating any digits
2. Pass the paper to the right
3. Reverse the 1st and 3rd digits
4. Pass the paper to the right
5. Subtract the smallest number from the largest (if you don’t have a 3 digit number add a zero
6. Pass the paper to the right
7. Reverse the 1st and 3rd digits
8. Add the last two numbers together

Answer = 1089

Ask for lessons learned

During exercise have played every role in the SIPOC

Shows how can’t focus just on the output

Can’t blame the last person in the chain

Can’t have a reward system based on the last output.

Think how the results could have been improved by being able to ask questions or talk with other team members or if there were quality checks at each stage.

## Magic Box

Divide the new team into groups of 3-4

30 sec - Show each group the contents of the box – no talking or writing during this time

90 sec - Close the box and have the individuals write down each item they saw

30 sec – have the individuals write down the number of items they remembered

5 min – have the group work together to come up with a comprehensive list and a count of the group items

5 min – Debrief – ask for lessons learned

The box represents the problem.

The exercise demonstrates why we need a team approach and cross-functionality, bandwidth

Average individual score is doubled by the team

Lesson: If can’t make a team meeting the whole team should get a notice not just the team leader – improves accountability.

Contents (37 items):

Cafeteria Pass

Thumb drive

Round green magnet

Small paper clip

Large paperclip

Extra lrg paperclip

Sm binder clip

Magnetic clip

Badge clip

Thumb tack

2 push pins

2 rubber bands

Post-it flag

Sm post-it note

3M Band-Aid

Kensington wet wipe

Sm white cardboard box

Power adapter

Red pen

Purple pen

Orange highlighter

Pencil

Level

Flower card envelope

Bolt

Wrist holder

AA battery

1 Quarter

1 Nickel

2 dimes

2 pennies

Ear piece

And . . . large piece of cardboard everything is attached to

## Santa’s Flowchart Flight



## Brainstorming Warm-up

Rules:

* **Focus on quantity**
* **No squelching** (**no criticism, judgment or evaluation)**
* **Unusual ideas are welcome**
* **Combine and improve ideas**

Break participants into groups of 3-4. Give each team a flip chart and marker. There will be prizes for the most uses and the most unique use.

Ask then to come up with as many uses for:



as possible.

After 15 min have them count their ideas and then cross off any ideas that are duplicates of other teams.

One observation they should make is that all teams came up with unique uses.

This also works well as a home work assignment. You can hint that kids are much better at this than adults

# Mind Grooving

## Word association

First word that comes to mind if you hear: Color

Furniture

Flower

Typical responses: red or blue

chair or couch

rose or daisy

## 1 – 2 – 3 Clap!

Ask people to stand up and put their arms out in front of them.

Say “Now I am going to count slowly to three and when I say “clap”, everyone should clap their hands together.

Slowly count 1 – 2 – 3 and then clap your hands together loudly, wait one second and then say “clap”. Pause a moment and then ask what happened.

Most people will have clapped.

Repeat and do it again.

We have automatic responses (habits).

Shows the power of listening.

## Circles in the air

Ask people to pick up a pen.

Hold it straight up and pretend to draw a circle on the ceiling in a clockwise direction.

Slowly continue to draw the circle clockwise and bring the pen down in front of your face.

Continue to bring it down until you are looking down on top of the circle.

What direction is the pen moving???

So what happened – the process (pen moving in a circle) hasn’t changed … but your **perspective** has!

What was your initial reaction?

## Oak, Joke, Croak

What do we call a tree that grows acorns?

What do we call a funny story?

What do we call the sound a frog makes?

What do we call the white of an egg? Yolk????

## Everything but sleep

Ten words on easel: Slumber, dream, bed, quiet, nap, pillow, night, blanket, pajamas, snooze.

Show these for 10 seconds, then hide them. Ask people to write as many words as they remember. How many wrote “sleep”?

## Guided thinking

**You can be guided in the wrong direction.**

**Perception**

## Spelling

fi yuo cna raed tihs, yuo hvae a sgtrane mnid, too. Cna yuo raed tihs? Olny 55 plepoe tuo fo 100 anc.

i cdnuolt blveiee taht I cluod aulaclty uesdnatnrd waht I was rdanieg. The phaonmneal pweor of the hmuan mnid, aoccdrnig to a rscheearch at Cmabrigde Uinervtisy, it dseno't mtaetr in waht oerdr the ltteres in a wrod are, the olny iproamtnt tihng is taht the frsit and lsat ltteer be in the rghit pclae. The rset can be a taotl mses and you can sitll raed it whotuit a pboerlm. Tihs is bcuseae the huamn mnid deos not raed ervey lteter by istlef, but the wrod as a wlohe. Azanmig huh? yaeh and I awlyas tghuhot slepling was ipmorantt!

## Visual Inspection Test

Task: You have **60 seconds** to document the number of times the **6th letter** of the alphabet appears in the following text.

The necessity of training farmhands for first-class farms in the fatherly handling of farm livestock is foremost in the eyes of farm owners. Since the forefathers of the farm owners trained the farmhands for first-class farms in the fatherly handling of farm livestock, the farm owners feel they should carry on with the family tradition of training farmhands of first class farmers in the fatherly handling of farm livestock because they believe it is the basis of good fundamental farm management.

Answer: The letter “f” occurs 36 times!

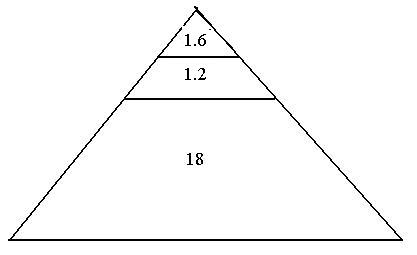
# Visuals & Stories

## Are we in the Same Boat?



## Ideas

Coca-Cola Sweden one year cost savings 1.6 million Euros from Black Belt projects, 1.2 million euros from Green Belt Projects, and 18 million Euros from employee idea system



## Controls



## Value Added vs. Non-Value Added work



## The 5 Why’s

* The 5 why's refers to the practice of asking, five times, why the failure has occurred in order to get to the root cause/causes of the problem.
* It illustrates the importance of digging down beneath the most obvious cause of the problem.
* Failure to determine the root cause assures that you will be treating the symptoms of the problem instead of its cause, in which case, the disease will return, and you will continue to have the same problems over and over again.
* Notes:
  + the actual numbers of why's is not important as long as you get to the root cause
  + There can be more than one cause to a problem

Example 1

**Problem Statement:** You are on your way home from work and your car stops in the middle of the road.

1. **Why** did your car stop?  - Because it ran out of gas.
2. **Why** did it run out of gas?  - Because I didn't buy any gas on my way to work.
3. **Why** didn't you buy any gas this morning?  - Because I didn't have any money.
4. **Why** didn't you have any money?  - Because I lost it all last night in a poker game.
5. **Why** did you lose your money in last night's poker game?  - Because I'm not very good at "bluffing" when I don't have a good hand.

Example 2

**Problem Statement:** The Washington Monument is disintegrating

1. **Why** is the Monument disintegrating? - Because of the use of harsh chemicals
2. **Why** are harsh chemicals being used? - To clean pigeon poop
3. **Why** are there so many pigeons? - They eat spiders and there are a lot of spiders at monument
4. **Why** so many spiders? - They eat gnats and there are lots of gnats at monument
5. **Why** so many gnats? - They are attracted to the light at dusk.

**Solution:** Turn on the lights at a later time.

## Process & Lean Thinking - We all do it

### Keys

Ask people what they do with their keys when they get home in the evening.

The same place every time? Why? To save time hunting for them next time you need them?

### Grocery shopping

Ask who goes grocery shopping. Do they always go to the same store? Same time of the week? Same route to the store? Why?

Do you make a list? Why?

Does anyone put their list in the same order as the store aisles?

### Moving the lawn

Which way is the most efficient? Circles, back & forth? Who’s experimented with it? Why?

## A Tale of Measures

When you see a Space Shuttle sitting on its launch pad, there are two big booster rockets attached to the sides of the main fuel tank. These are solid rocket boosters, or SRBs. Thiokol at their factory in Utah makes the SRBs. The engineers who designed the SRBs would have preferred to make them a bit fatter, but the SRBs had to be shipped by train from the factory to the launch site. The railroad line from the factory happens to run through a tunnel in the mountains. The SRBs had to fit through that tunnel. The tunnel is slightly wider than the railroad track. The US standard railroad gauge (the distance between the rails) is 4 feet, 8.5 inches, when you would expect it to be perhaps 4 or 5 feet - in other words a multiple of the measuring system of that time and place. When the railroads were built, the engineers used feet. So why was that rather odd measurement used? Because that is the way they built them in England, and English expatriates built the US Railroads. Why did the English build them like that? Because the first rail lines were built by the same people who built the pre-railroad tramways, and that is the gauge they used. Why did “they” use that gauge? Because the people who built the tramways used the same jigs and tools that they used for building wagons, which used that wheel spacing. Why did the wagons have that particular odd wheel spacing? Well, if they tried to use any other spacing, the wagon wheels would break on some of the old, long distance roads in England, because that’s the spacing of the wheel ruts. So who built those old rutted roads? Imperial Rome built the first long distance roads in Europe (and England) for their legions. The roads have been used ever since. And the ruts in the roads? Roman war chariots formed the initial ruts, which everyone else had to match for fear of destroying their wagon wheels. Since the chariots were made for Imperial Rome, they were alike in the matter of wheel spacing. Carts and wagons through the ages still had to conform to the same wheel spacing – the ruts in the road ever-deepening. As this popular tale ends, the roman War Chariot was designed the width that it was to accommodate two horses with which to pull it.

Therefore, a major Space Shuttle design feature of what is arguably the worlds most advanced transportation system was determined over two thousand years ago by the width of a horse’s arse.

# Puzzles

## Hole

A person goes into a hardware store looking for a drill and a drill bit.

What do they really want?

*This is a good one for demonstrating the importance of VOC (Voice of the Customer)*

## Thinking outside of the Box

You will be given a piece of paper that looks like this.

**Without lifting your pen**, draw **four straight lines** through **all nine dots.**

# Resources

## Videos

* Fawlty Towers DVD – Disc 3, “Waldorf Salad” Episode, start at 1min end at 4 min – good illustration of the pitfalls of not understanding who the customer is (vs. supplier)
* Monty Python Dead Parrot skit – listening to your customer
* “Rudy: The Rudy Giuliani Story” – gemba
* “Toast Kaizen” – The #1 selling Lean training tool in the world is the Perfect introduction to Continuous Improvement - available from GBMP
* “Moments of Truth” - invites managers and supervisors to take a look in the mirror to examine how their actions and reactions can alternately energize the continuous improvement program or kill it - available from GBMP
* “Dozen Eggs” – Reducing Lot sizes – available from GBMP
* “Time: The Next Dimension of Quality” - illustrates how organizations can take time out of work processes and be faster, nimbler, and more responsive and adaptive to customer needs – good for office environments

## Recommended Reading

These books are recommended for anyone wanting to learn more about improving productivity, reducing cycle time and waste and increasing overall performance through Lean Six Sigma.

Take the opportunity to read about how you can take quality to the next level within your products, services and processes.

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| **Title** | **Author** |
| Abelene Paradox | CRM Learning |
| [Art of Innovation: Lessons in Creativity from IDEO, America's Leading Design Firm](http://www.amazon.com/Art-Innovation-Lessons-Creativity-Americas/dp/0385499841/ref=pd_bbs_sr_1/103-3557605-9462247?ie=UTF8&s=books&qid=1193842169&sr=1-1" \t "_blank) | Tom Kelley,  Johnathan Littman |
| Built to Last: Successful Habits of Visionary Companies (Harper Business Essentials) | Jim Colins |
| CMMI : Guidelines for Process Integration and Product Improvement | Mary Beth Chrissis |
| Doing Business in Asia: The Complete Guide | Sanjyot P. Dunung |
| Dozen Eggs | GBMP |
| Execution: The Discipline of Getting Things Done | Larry Bossidy |
| Exel Annoyances | Curtis Frye |
| Good to Great: Why Some Companies Make the Leap... and Others Don't | Jim Colins |
| [In Search of Excellence: Lessons from America's Best-Run Companies](http://www.amazon.com/Search-Excellence-Americas-Companies-Essentials/dp/0060548789/ref=pd_bbs_sr_1/103-3557605-9462247?ie=UTF8&s=books&qid=1193842542&sr=1-1" \t "_blank) | Thomas J. Peters,  Robert H. Waterman |
| Leading Change | John P. Kotter |
| Lean Six Sigma for Service : How to Use Lean Speed and Six Sigma Quality to Improve Services and Transactions | Michael L. George |
| Lean Thinking: Banish Waste and Create Wealth in Your Corporation | James Womack and Daniel T Jones |
| Learning to See | Mike Rother & John Shook |
| Management Inforamtion Systems: Managing the Digital Firm | Laudon, Laudon |
| Managing the Software Process | Watts S. Humphrey |
| Monty Python's Flying Circus; Episodes 7, 8 & 9 (inc. Dead Parrot sketch) |  |
| Operations Management: Processes and Value Chains, 8th edition | Lee J. Krajewski |
| Six Sigma For Dummies | Craig Bygi |
| Six Sigma For Managers | Greg Brue |
| The 7 Habits of Highly Effective People | Stephen R. Covey |
| The Goal | Eliyahu M. Goldratt |
| The Leadership Challenge, 3rd Edition | James M. Kouzes |
| The Lean Six Sigma Pocket Toolbook: A Quick Reference Guide to 100 Tools for Improving Quality and Speed | Michael L. George |
| The Six Sigma Way Team Fieldbook: An Implementation Guide for Process Improvement Teams | Peter S. Pande |
| The Toyota Way: 14 Management Principles From The World's Greatest Manufacturer | Jeffrey Liker |
| Time: The Next Dimension of Quality | CRM Learning |
| Time: The Next Dimension of Quality | CRM Learning |
| Toast Kaizen | GBMP |
| What is Lean Six Sigma? | George, Rowlands, Kastle |
| What They Don't Teach You At Harvard Business School: Notes From A Street-Smart Executive | Mark H. McCormack |
| Who Says Elephant Can't Dance? | Louis V. Gerstner |
| Who Says Elephant Can't Dance? | Louis V. Gerstner |
| The Ice Cream Maker; An Inspiring Tale About Making Quality the Key Ingredient in Everything You Do | Subir Chowdhury |
| Zapp! The Lightning of Empowerment; How to Improve Quality, Productivity and Employee Satisfaction | William C. Byham |