Certification Workshop: Mastering the Essential Tools of Value Stream Mapping, A3 Writing and Kata

Rita D'Angelo
Lab Quality Confab
New Orleans, 2016

Agenda

- **1. Value Stream Mapping**
  - 10,000 foot view of a process
- **2. A3 Scientific Method of Problem Solving**
  - Problem Solving Tool
- **3. Improvement Kata**
  - Small, structured practice routines

Based in the Principles of Lean

- What doesn't add value is waste
- Go to the point of where the work is performed and ask why???
- Innovation often happens closest to where the work gets done
- Those that do the work have the most practical ideas

Learning Objectives

At the end of this presentation the student will be able to:

1. Understand how to develop a simplistic Value Stream Map
2. Identify relevant metrics and understand how to use those measures to implement appropriate changes to the process
3. Understand how to use the scientific method to problem solve
4. Perform Plan, Do, Check, Act improvement repetitions through Kata

Value Stream Mapping

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Learning Objectives

The learner will be able to:

- Identify and eliminate non-value added activities
- Analyze the current state map to identify improvement opportunities
- Identify metrics to drive improvement
- Create a future state map using VSM tools

Definitions

Value Stream Mapping:

- A method to analyze the current state of a process at a 10,000 foot view and design an efficient, waste free future state.

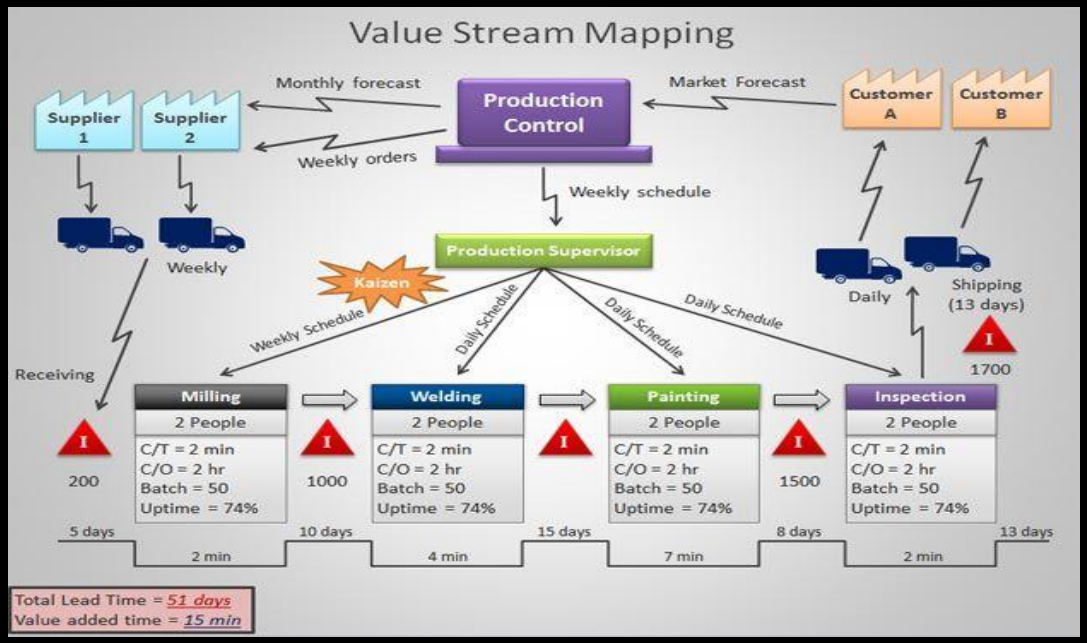
Goals of Value Stream Mapping

- Create a common vision for the team
- Provide a visual roadmap to allocate the appropriate resources
- Reinforce a culture of learning and continuous improvement

Shortest lead time, highest quality, at the lowest cost possible in order to deliver the highest level of customer satisfaction. ASQ, (2015)

Value Stream Mapping

- A visualization tool to help understand and streamline work processes
- Visualize process steps and identify waste
- Foundation for implementing other Lean tools



How Do I Develop a VSM?

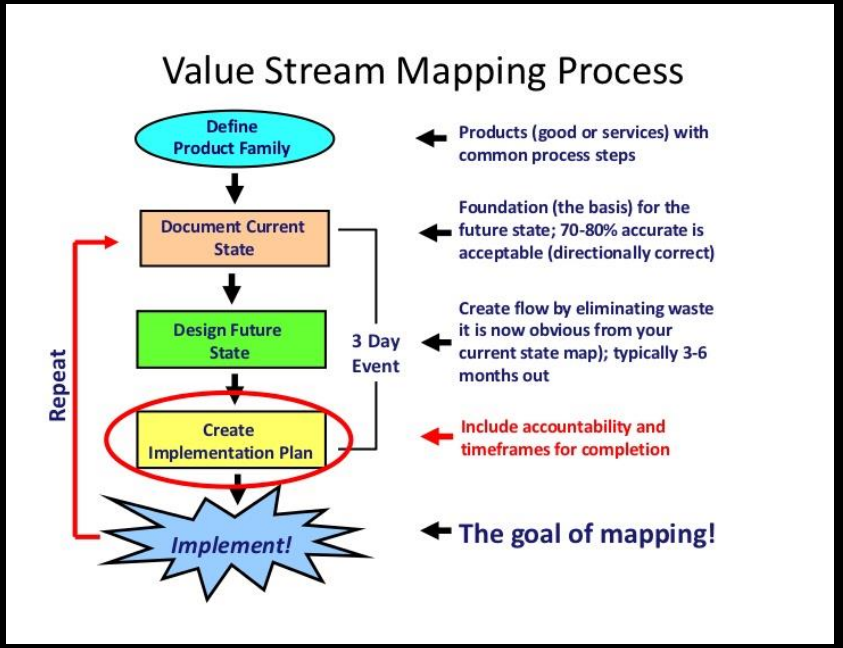
- Follow the process from beginning to end
- Draw a visual representation of every process
- Identify material & information flows
- Draw a "future state" map to show the waste free value stream

Value Stream: What does it Include?

- All of the activities (value and non-value added) required to bring a service / product from **customer request** to fulfillment

- Value = what the customer is willing to pay for

Value is determined by the **customer**

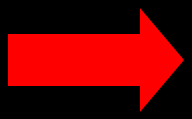


Waste Identification

- Waste is:
- Anything that does not add value
- Should be looked at from both the macro (facility) an micro level (task activity)
- A result of variation from a process standard

The Lean Healthcare Pocket Guide

Debra Hadfield



Defects and Waste

1.
2.
3.
4.

Steps to Create a Value Stream Map

Current State Map

1. Define the Process to be mapped
   a) Where does it start and end
2. Create a knowledgeable team
3. Identify and map supplier(s) and customer(s)
4. Identify and map each major process step
5. Understand and map information flow
6. Gather data
7. Identify areas for improvement
   a) Red flags
   b) Inefficient flow
   c) Waste

Potential Metrics

- Distance traveled
- Value-added vs. Non value-added time
- Number of touches
- Waiting minutes
- Cycle time
- Defects
- Processing Time:(P/T)
- Wait Time (W/T)
- Lead Time: (L/T)

Plan of Action

- First steps
  - Identify Gap/Customer Complaint
  - Establish Scope
  - Walk-through the process
  - Gather metrics
- Then
  - Create current state map
  - Determine what should improve
  - Create future state map
  - Determine actions to complete and due dates
- Last but not least
  - Start a new process with a new current state map: Continuous Improvement!

The Current Condition

Understanding the Current Condition

- The patients of a Health Clinic receive a survey in paper form upon leaving the clinic. The patients are asked to complete the form in the office or mail it after the visit.
- Surveys are analyzed, results compiled, and findings are reviewed with physician leaders
- The findings are as follows:
  - It takes 3 months to be seen by the physician
  - Patients report…
    - Long wait times on the phone to book appointments
    - Long wait time upon arrival at the clinic
    - Long wait times in waiting room to see the physician
  - Post care and taking payment is very timely

HOW TO Create a VSM

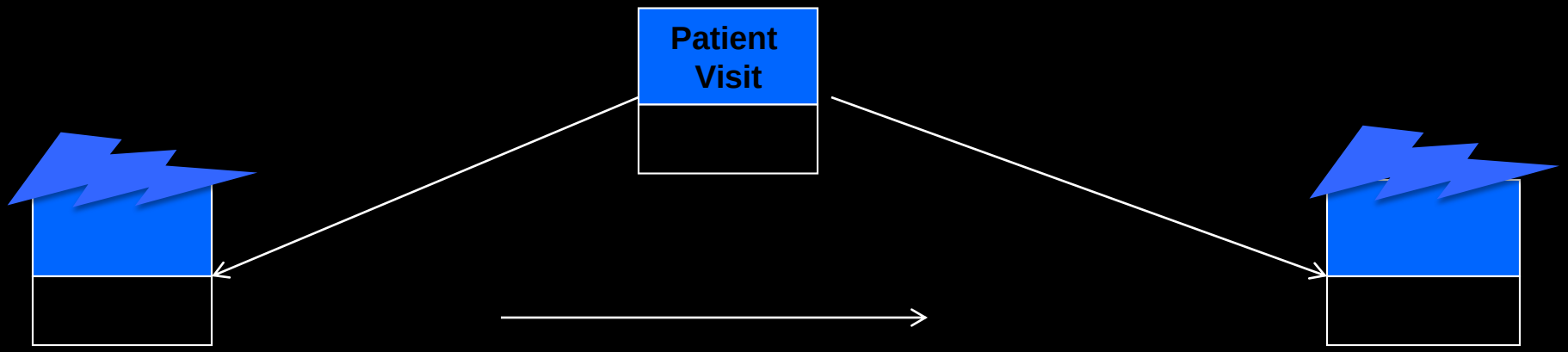
Rules of Engagement

- Starting out
  - Keep it 'Simple'
  - Start at a higher level, details can wait
- Do
  - Invite participation and constructive solutions
  - Be respectful, positive and receptive to change
- Don't
  - NO finger-pointing and blame

The Lean Healthcare Pocket Guide
Debra Hadfield

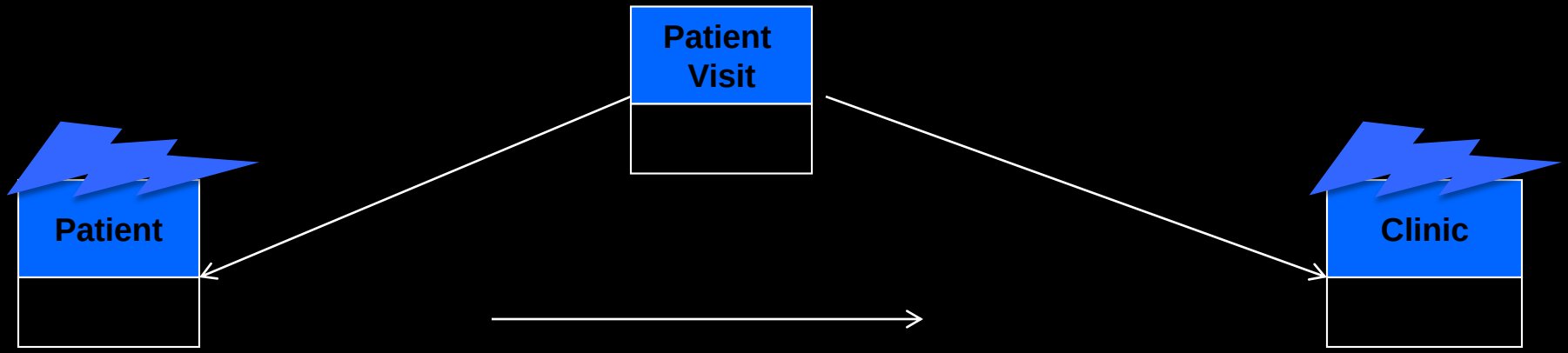
Draw the Process

- Describe our process
- Customer? Supplier?
- Based on the data - where does the process start?
- Based on data - where does the process end?



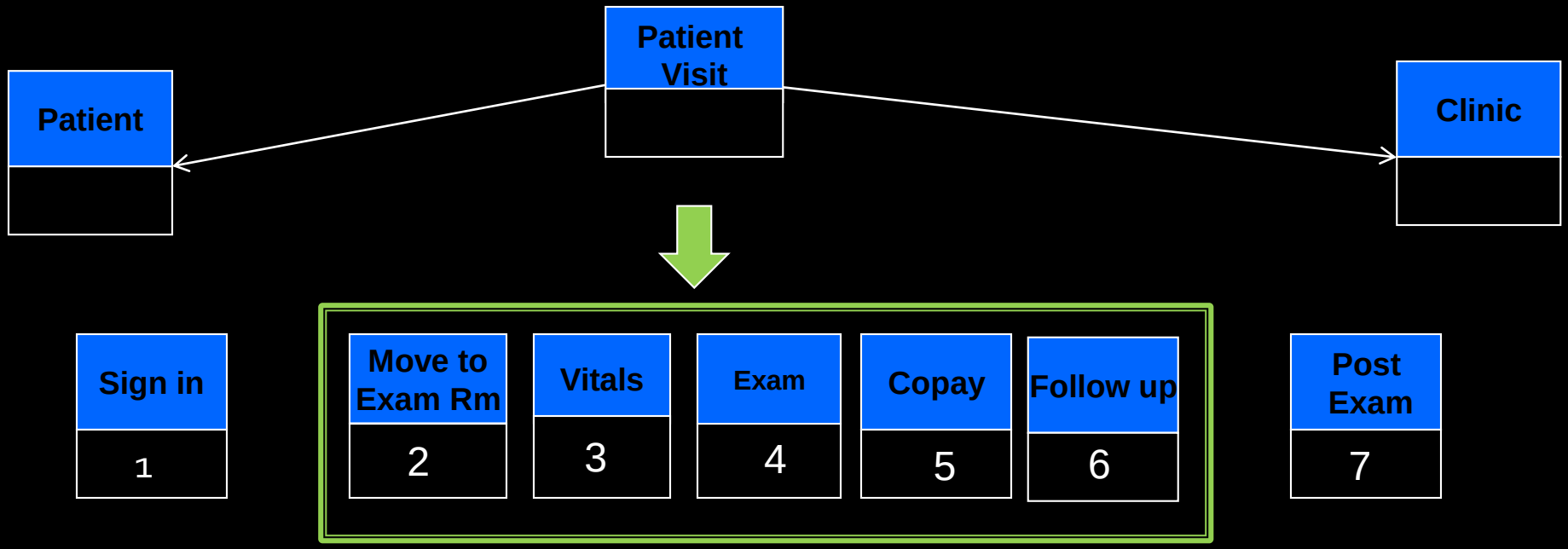
Complete the Process

- What is our process? = **Patient Visit**
- Who is the customer = **Patient**
- Who is the supplier?= **Clinic**
- Where does the process start? **= Scheduling**
- Where does the process end? **= Patient Exit**



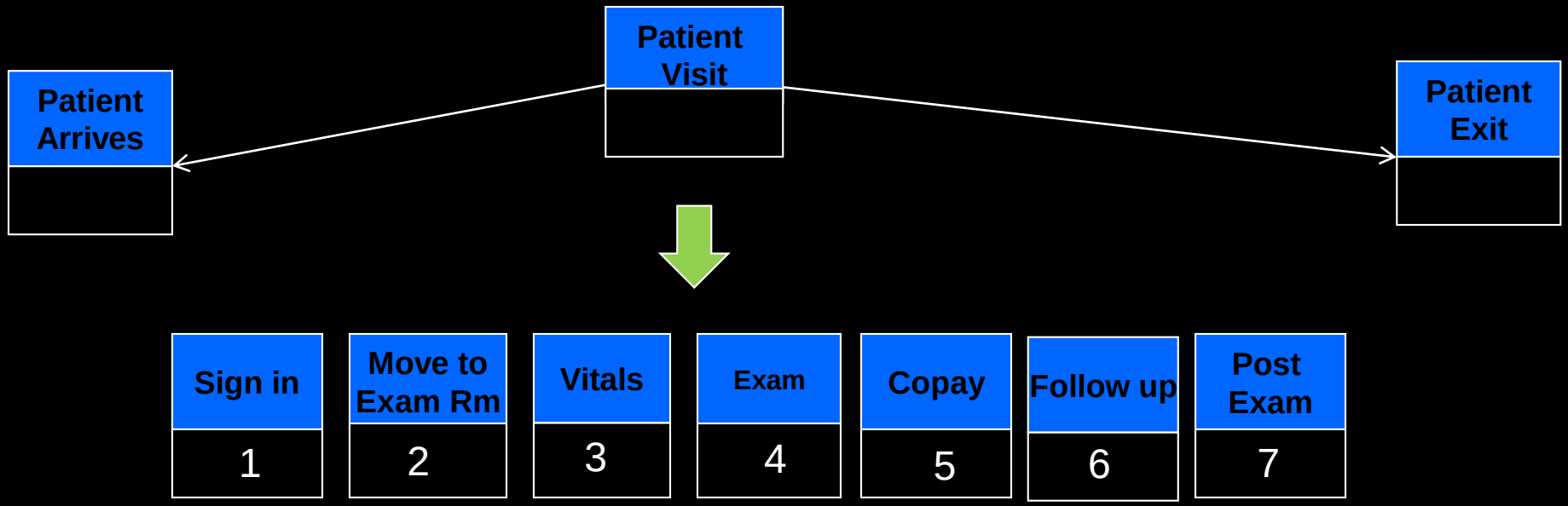
"How To" Add Remainder of Processes

- Add the steps between start and finish



- You've completed your first steps

This is Our Current State Map!

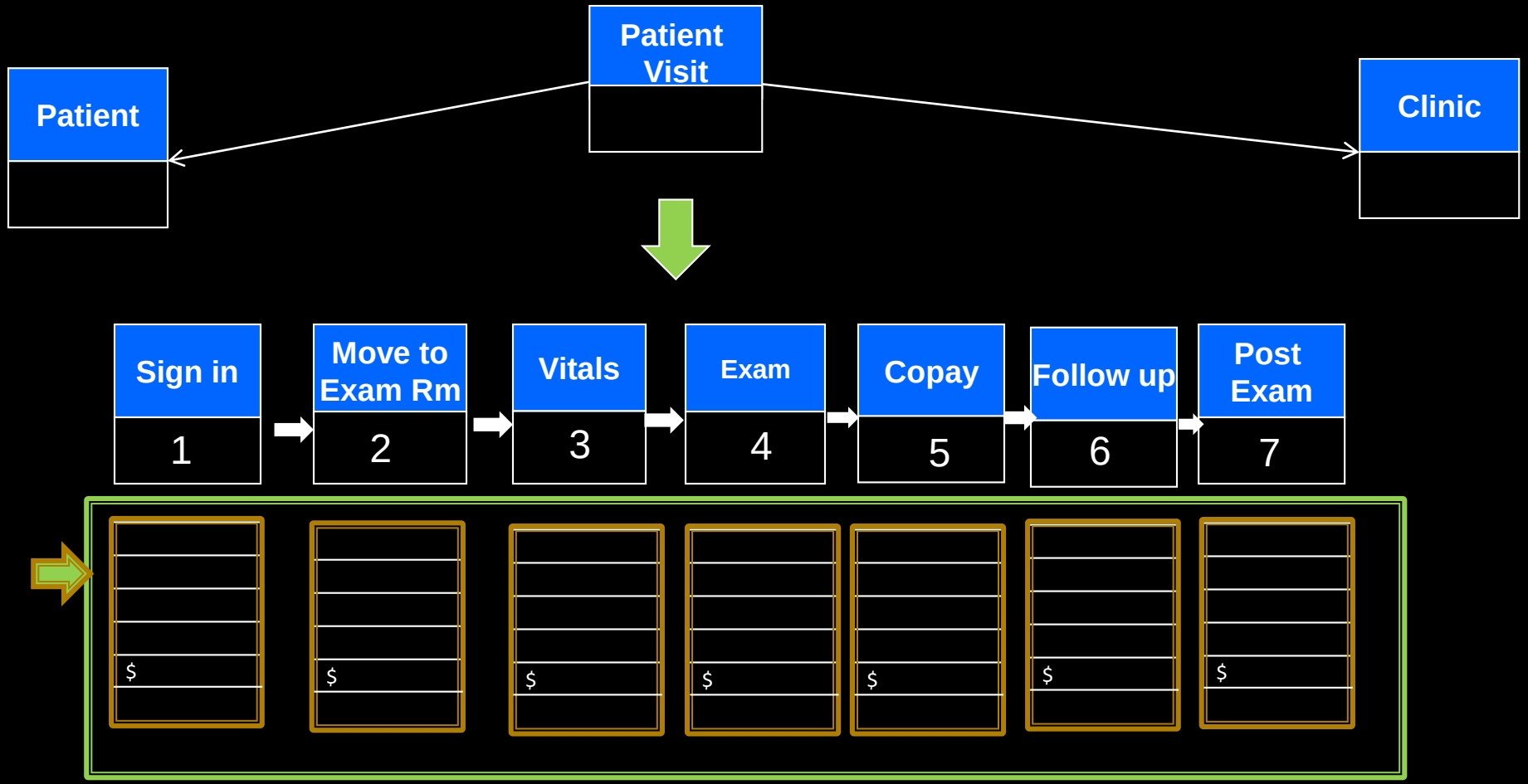


Common VSM Metrics (at each process step)

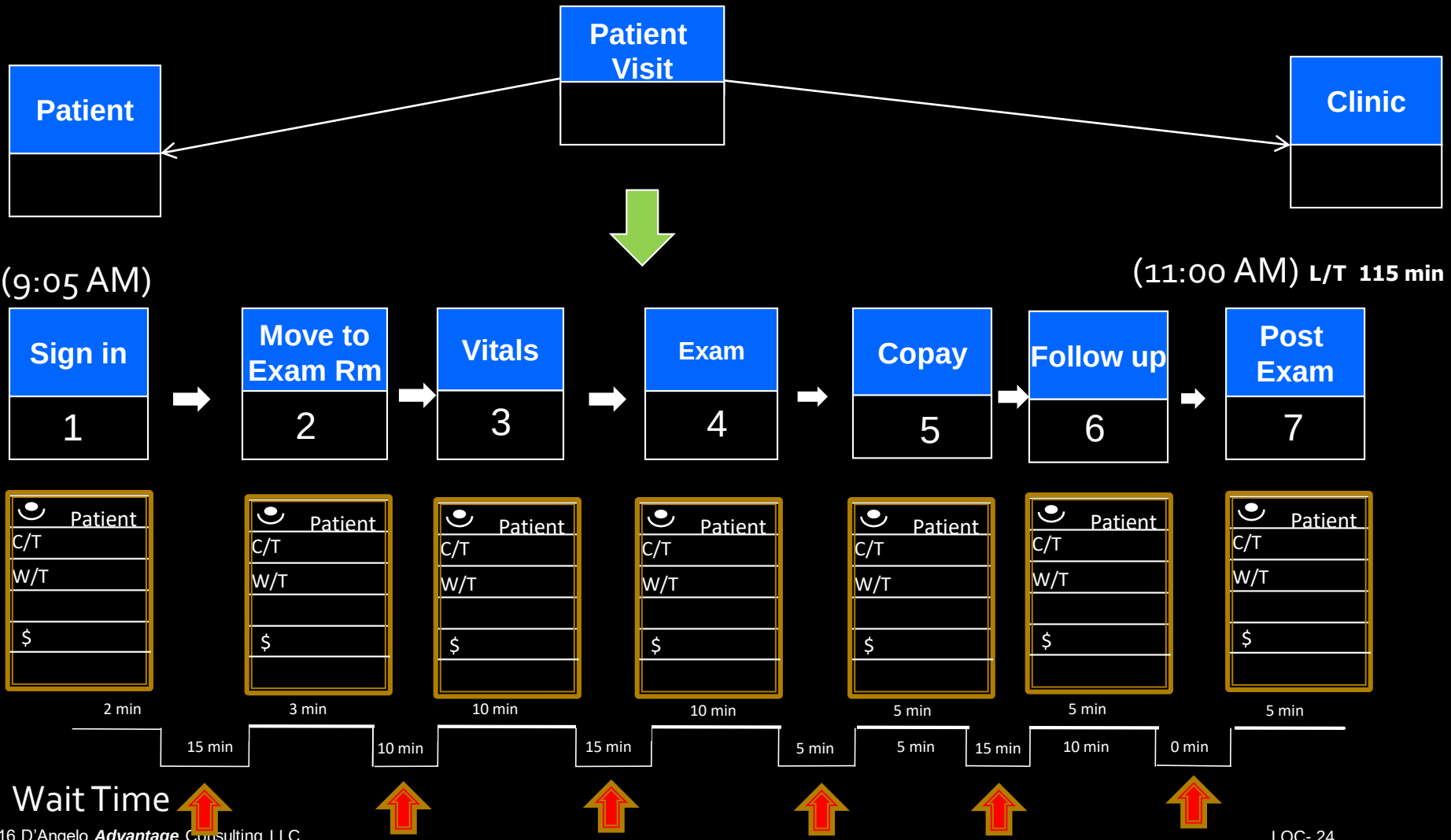
- Process time (C/T) = Actual time to produce one unit
- Wait time (W/T) = Time waiting between process steps
- Lead time (L/T) = Total time from start to finish

Current State

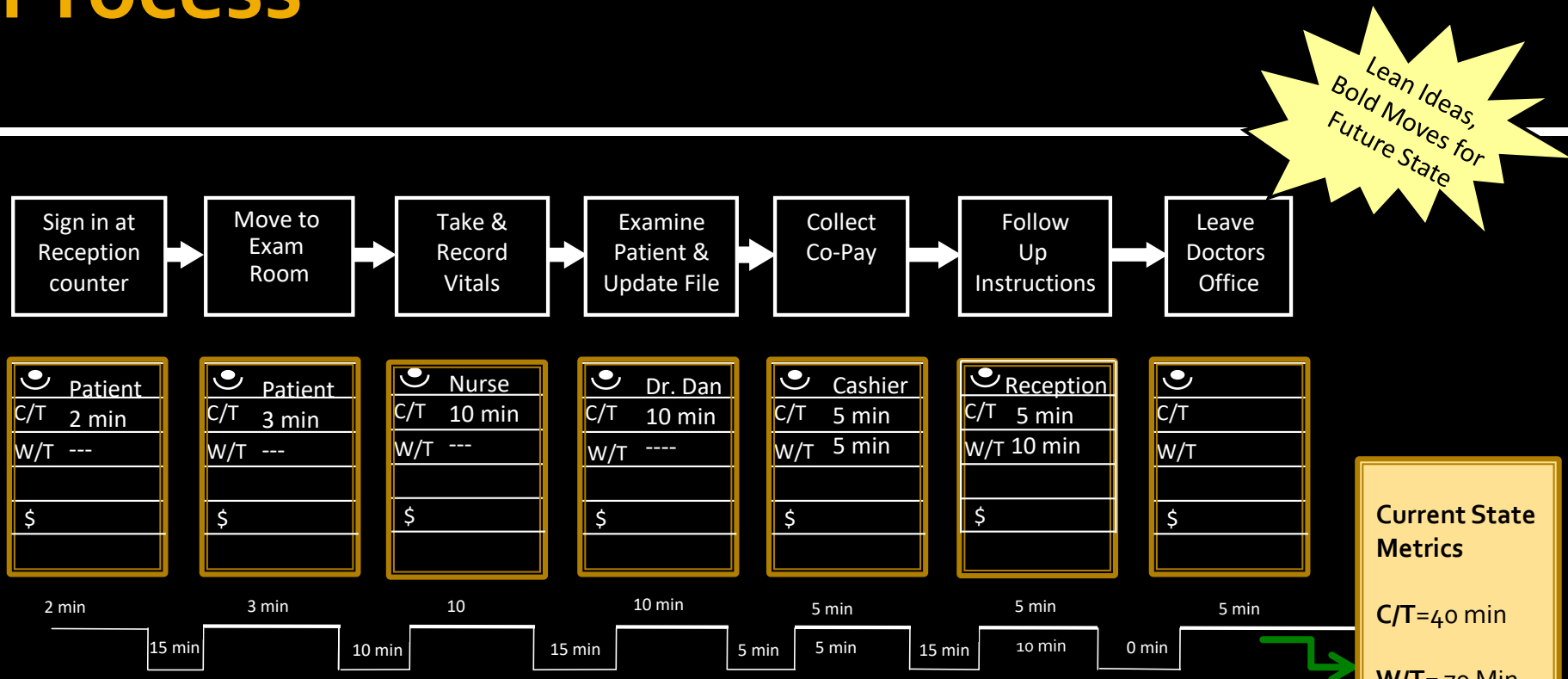
Add data boxes and determine relevant metrics



Add Metrics: Process Time and Waste



Process



Current State Metrics

C/T=40 min

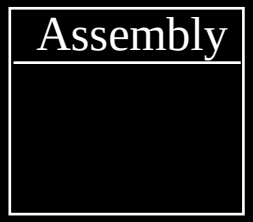
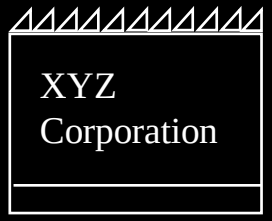
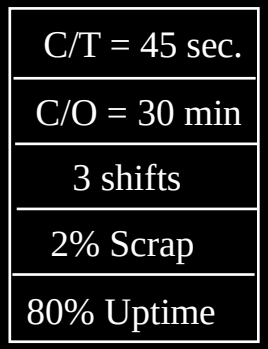
W/T= 70 Min

Total Time= 115 Min

One Patient tracked for a regular exam

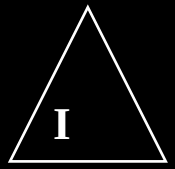
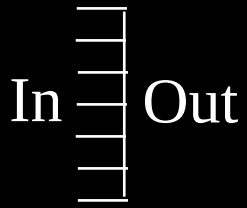
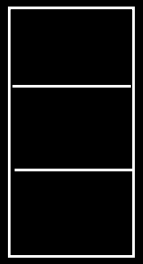
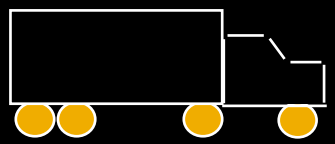
Value Stream Mapping Symbols

Material Flow Icons

Icon	Represents	Notes
	Process	One box equals an area of continuous flow. Label all processes. Also used for depts. Like production control
	Outside Entities	Use to show customer, suppliers and external processes
	Data Box	Used to record information concerning a process, department, etc.

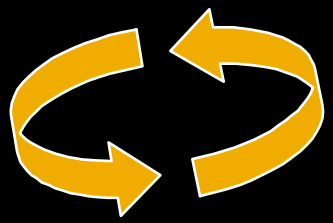
(ARUP, 2015)

Icons

Icon	Represents	Notes
 300 Pieces, 1 day	Inventory	Count and time should be noted
	Supermarket	Direction of legs indicate in and out
	Buffer or safety stock	Buffer or safety stock must be noted on the drawings
	Truck Shipment	Note frequency of shipments

(ARUP, 2015)

Icons

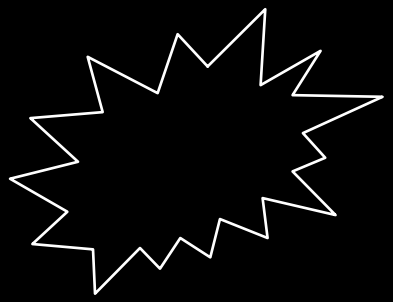
Icon	Represents	Notes
	Movement of Finished Goods	Also shows movement of raw material and components from suppliers (if they are not pushed)
	"Push" material movement	Identifies material pushed by the supplier not pulled by the consumer
	Physical pull	Pull of materials from a supermarket
	Transfer of controlled quantities of material between processes in a first in first out sequence (ARUP, 2015)	Indicates a device to limit quantity and ensure FIFO flow of material between processes. Max quantity should be indicated. Use downstream pacemaker processes **only!**

Icons

Icon	Represents	Notes
	Manual information flow	Example: production schedule to shipping
	Electronic information flow	Example: LIS
	Captures information	Used to describe an information flow
	"Go See" production scheduling	Adjusting scheduling based on checking inventory level. Not a true pull. Used in current state diagrams **only**

(ARUP, 2015)

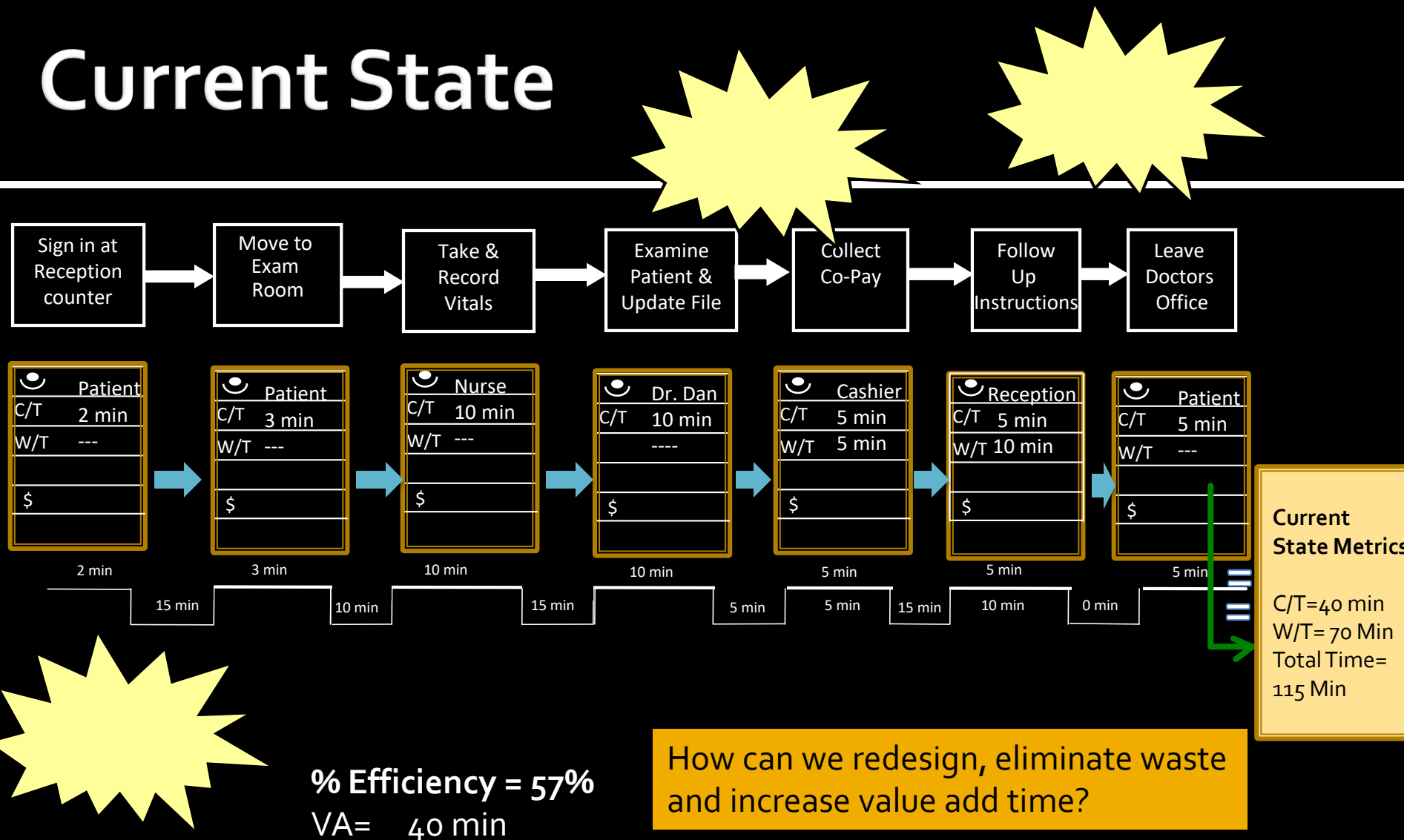
Icons

Icon	Represents	Notes
	Operator	Represents a person viewed from above
	Kaizen lightening burst	Highlights critical improvement needs at specific processes. Indicates an area of critical need in the implementation process

(ARUP, 2015)

Future State Map

Current State



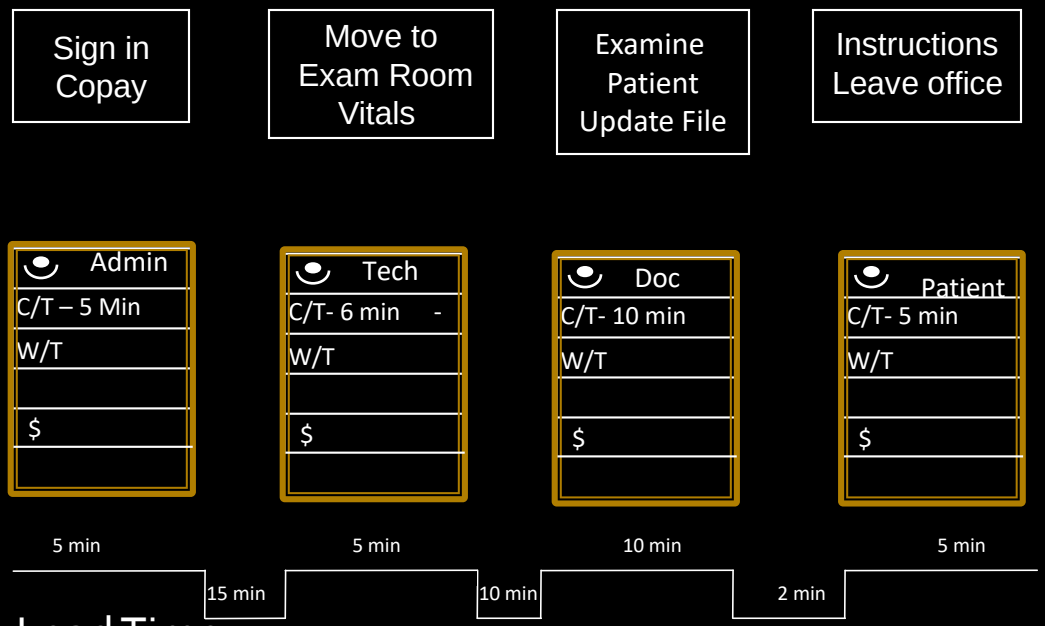
Current State Metrics

C/T=40 min
W/T= 70 Min
Total Time= 115 Min

% Efficiency = 57%
VA= 40 min
NVA= 70 min

How can we redesign, eliminate waste and increase value add time?

Future State



Lead Time

VA = 25

NVA = 27

= 93% Value Add Time

Future State Metrics

P/T=25 min
W/T= 27 Min

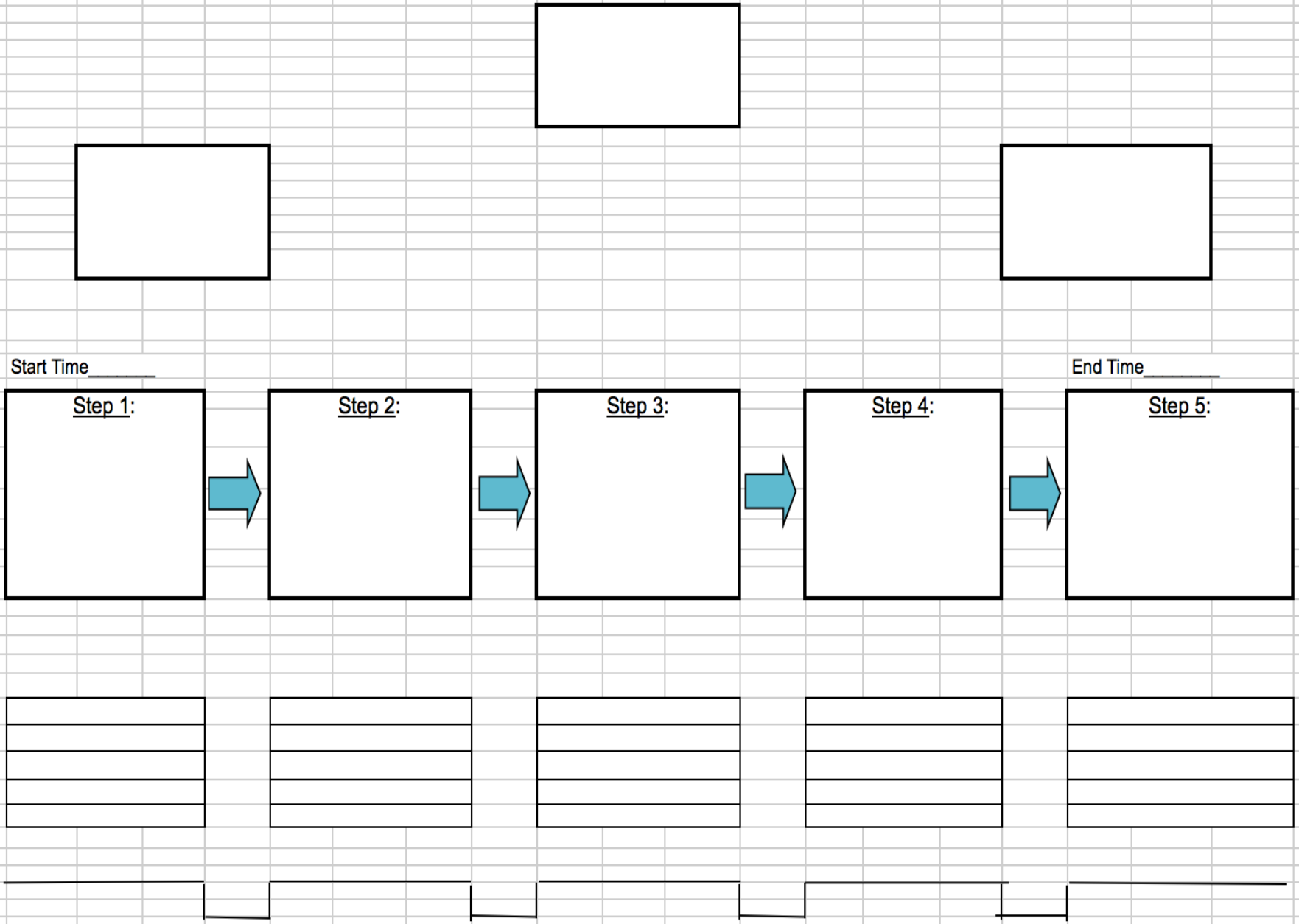
Metrics

- Current State = 57% efficiency
  - VA = 40 min
  - NVA = 70 min
- Future State = 93% efficiency
  - VA = 25 min
  - NVA = 27

Help ME
Develop my MAP

My VSM

- Illustrate the answers to these questions in your VSM:
  - What is going on here?
  - What is the critical problem?
  - What are the 5-7 high level steps
  - How long does each step take?
  - What is the value add time?
  - What is the non value add time?
  - Calculate the percentage of waste



Consider the Hand-Off Opportunities

Hand-Off Opportunities

1.
2.
3.
4.

Hand-Off Opportunities

1.
2.
3.
4.

Hand-Off Opportunities

1.
2.
3.
4.

Hand-Off Opportunities

1.
2.
3.

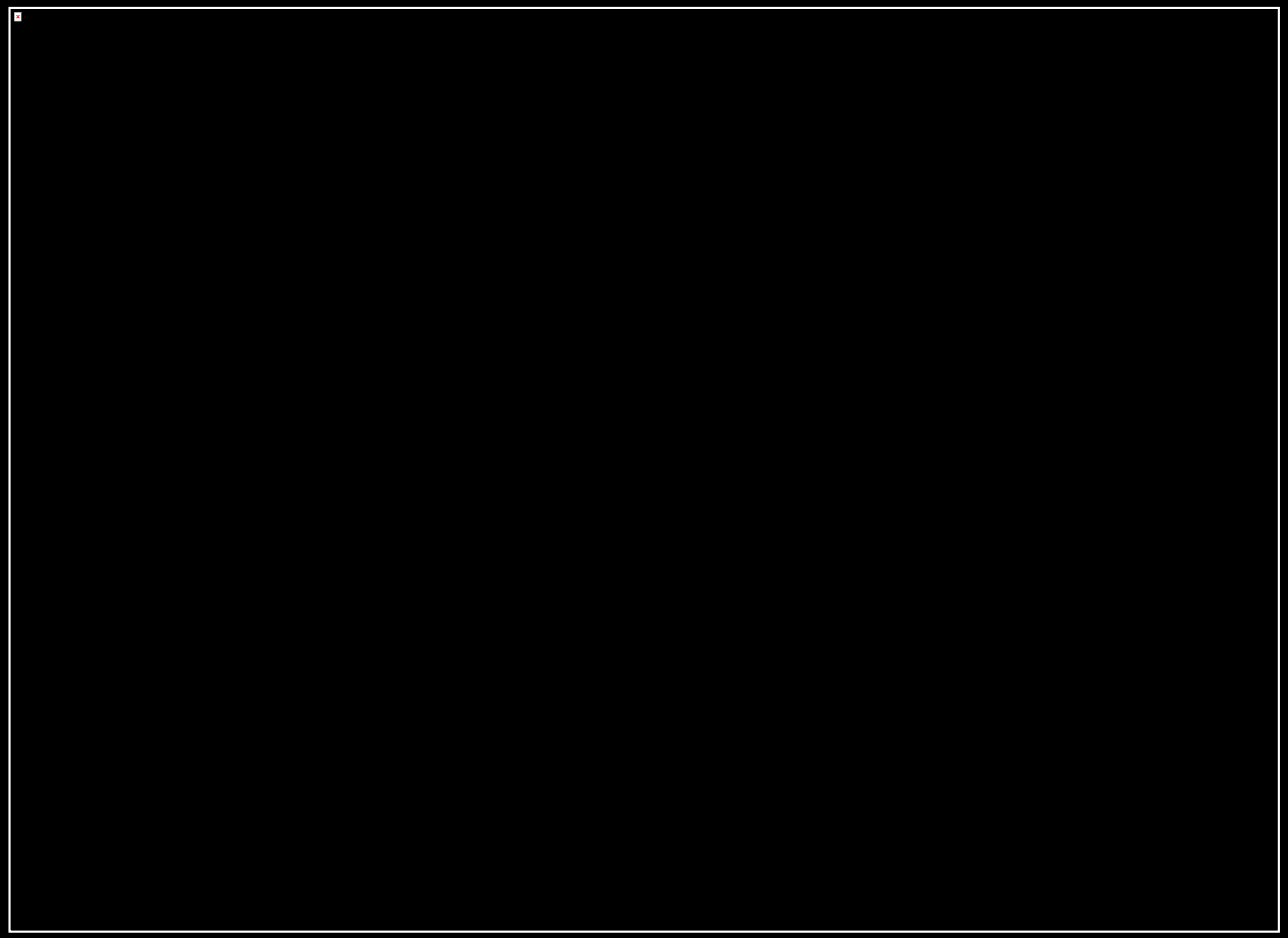
Standardization

- Standardize the newly acquired process
- Ensure to sustain results

How do we do it?

1. New plan becomes a part of the daily work
2. Revise standardized work as needed/ongoing
3. Train & educate new employees
4. Assign responsibility to sustain & monitor results

Value Add/Non Value Add Work Sheet



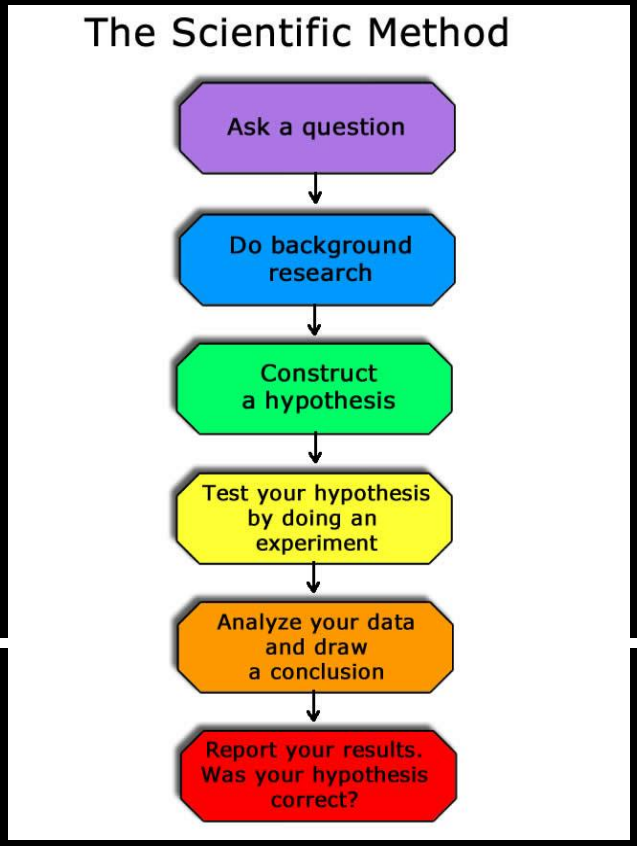
Take Home Message

- VSM is a systemic and visual
- Requires each team member to provide input, identify waste and plan improvements
- Requires determination of metrics
- Always a work-in-progress towards a ‘better” future-state VSM

The Lean Healthcare Pocket Guide
Debra Hadfield

A3 Writing

Scientific Problem Solving



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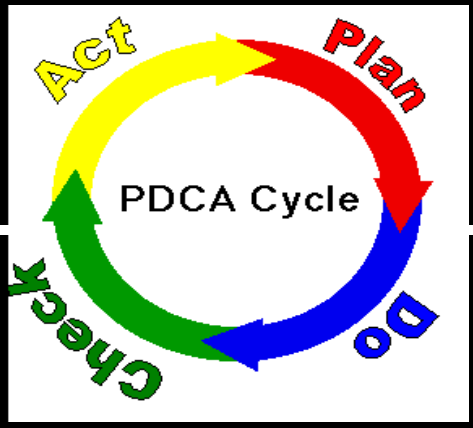
OBJECTIVES



The Participants will be able to:

- Construct an A3 diagram
- Understand the logic
- Perform problem solving with PDCA cycles
- Identify each element
- Understand the data to be collected

- **Exercise:** Each team will perform the following:
- Choose a team leader
- Present the A3 Report to the group

What is an A3?

- Problem-Solving, like telling a story
- Vital information- problem/data/solution
- 11x 17 size, communicated by fax
- Team based problem solving using
  - (Plan-Do-Check-Act) cycles
- Primarily a communication tool that also manages & standardizes the processes

Liker JK. The Toyota Way Field Böök: A Practical Guide for Implementing Toyota's 4P's. McGraw-Hill; 2006.

Core of an Improvement Process

What changes are desirable?

What is most important to this organization?

What data is available?

Carryout the change

Decided by the team

On a small scale (Pilot)

Observe the

effects of the pilot

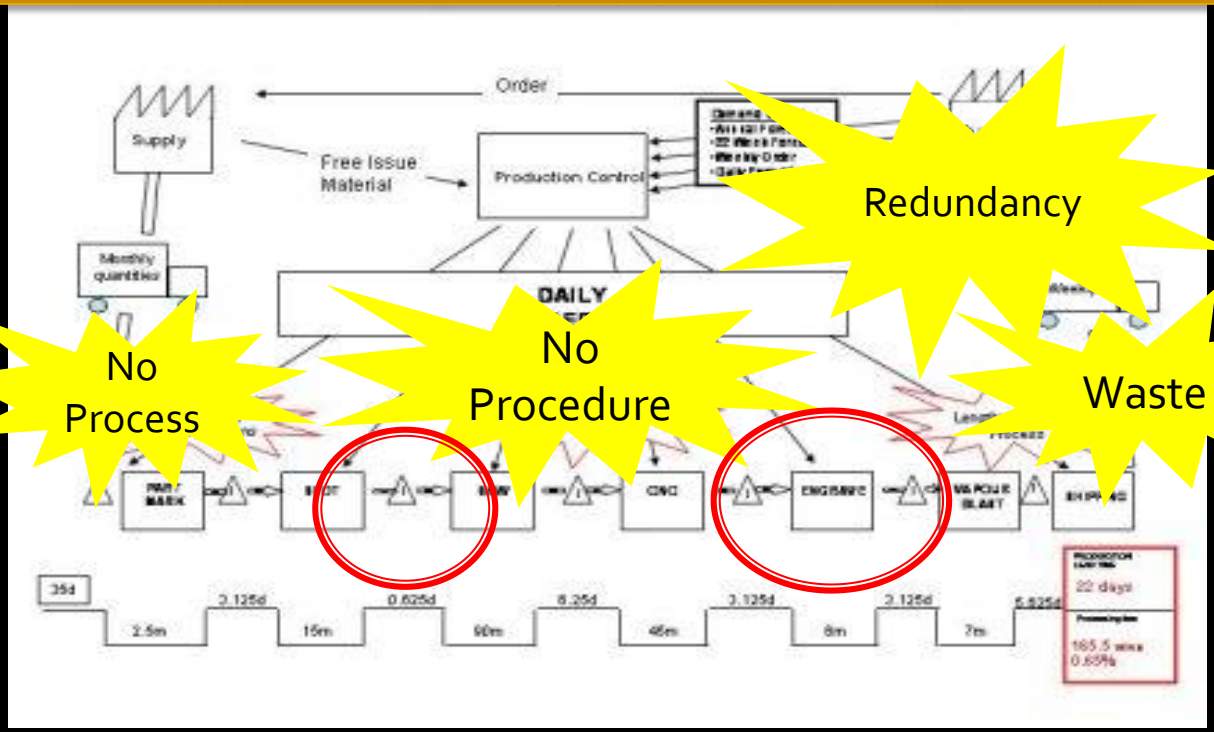
Study results

What did we learn?

What can we predict?

Action Items/Opportunities/Kaizen Bursts

Step elimination & opportunities for improvement



A3 Problem Solving Tool

Background
State the problem
Narrow down to specifics

Hypothesis
What is your educated guess about the problem?

Current Condition
What is the current situation or baseline? Collect simple data. What does the data tell us? Analyze collected data to show the current situation
What is the root cause of this problem?
Choose simplest problem-analysis tool
Ask "why" 5 times

Action Plan
What NEW steps are required to achieve the target condition?
Is root cause considered to prevent reoccurring?

Target Condition - Goal
Can the Process be improved to prevent error?
What outcome is needed to achieve the goal?
What is possible from first round of PDCA?

Implementation Plan
Roll out the New Plan- "Action Plan" as a pilot
Assign responsibility to implement the plan.
who ? When ? Where? Get consensus &
train all involved
Test the effectiveness of new plan
Recollect same data points and compare with "Current Condition"
Did we reach the outcome set in the "Target Condition"?
If not, repeat PDCA

Standardization
Standardize the process to ensure it is built into the fabric of the organization.
No Variation

Way things happen now – Current State | **The better way of work – Ideal State**

Problem Background

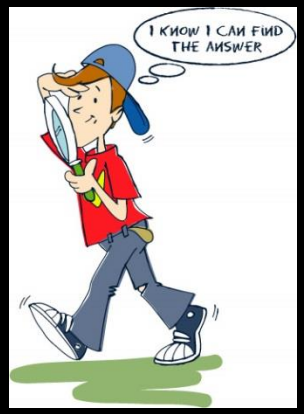
- State the problem
- Narrow down the problem down to a specific issue
- Research background information understanding
- What was the error or problem that occurred?

How do we do this?

- Communicate & brainstorm with staff that do the work
- Work with your internal/external customers
- Clearly understand the request of the customer

Current Condition

- What is the baseline? Where are we?
- Collect data: what does the date show?
- Analyze and prioritize the starting point

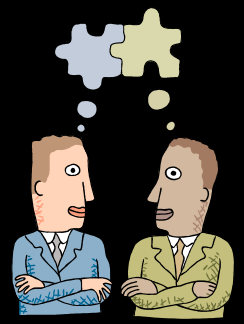


How do we do this?

1. Diagram the process according to what was actually done
2. Use maps to demonstrate pathways, flow of information
3. Use simple data techniques to document current situation
4. All affected/involved must collect data

Problem Analysis

- What is the cause –and-effect relationships of the problem?
- Is it an actual cause or a symptom?
  - Identify the root causes
  - Prevent the reoccurrence-Countermeasure



Root Cause Analysis: How do we do this?

By 5 Why's and Fishbone diagram

Target Condition

- Can the process be improvement to prevent error?
- With team consensus agree on a new/revised process
- Identify the perfect process

How do we do it?

1. Design an efficient process
2. Have we met the customer requirement?
3. Is this plan reasonable?

Working Towards the Target

Ideal state

Next obstacle waiting

Don't wait until you have a perfect solution

Target condition

Current condition

Action Plan

- Develop steps for the new plan by team consensus
- Does the plan make sense
- Consider all areas affected by the (upstream & downstream effects)
- Was the root cause considered?

Implementation Plan

- Roll out the New Plan- "Action Plan" as a pilot
- Assign responsibility to implement the plan. who ? When ? Where? Get consensus & train all involved
- Test the effectiveness of new plan
- Recollect same data points and compare with "Current Condition"
- Did we reach the outcome set in the "Target Condition" ?
- If not, repeat PDCA

Consider

1. Who and when to implement the new plan
2. Ensure supervisor involvement and feedback
3. Educate all members involved in the process

Implementation Plan

	Implementation Plan			
	Specific Task	Name of Team Member	Date/Time Expected	Date Completed
1				
2				
3				
4				
5				
6				
7				

Standardization

- Standardize the newly acquired process
- Ensure to sustain results

How do we do it?

1. New plan becomes a part of the daily work
2. Revise standardized work as needed/ongoing
3. Train & educate new employees
4. Assign responsibility to sustain & monitor results

A 3 Breakout

Exercise: Each team will perform the following:

- Choose a team leader
- Complete the A3
- Present the A3 report to the group
- Ensure data collection is considered

Questions?

What is a KATA?

Origin From the of the Word “Kata”
Kata (literally: "form") is a Japanese word that refers to detailed choreographed patterns of movements practiced either solo or in pairs
Kata are used in many traditional Japanese arts but are most commonly associated with the martial arts.

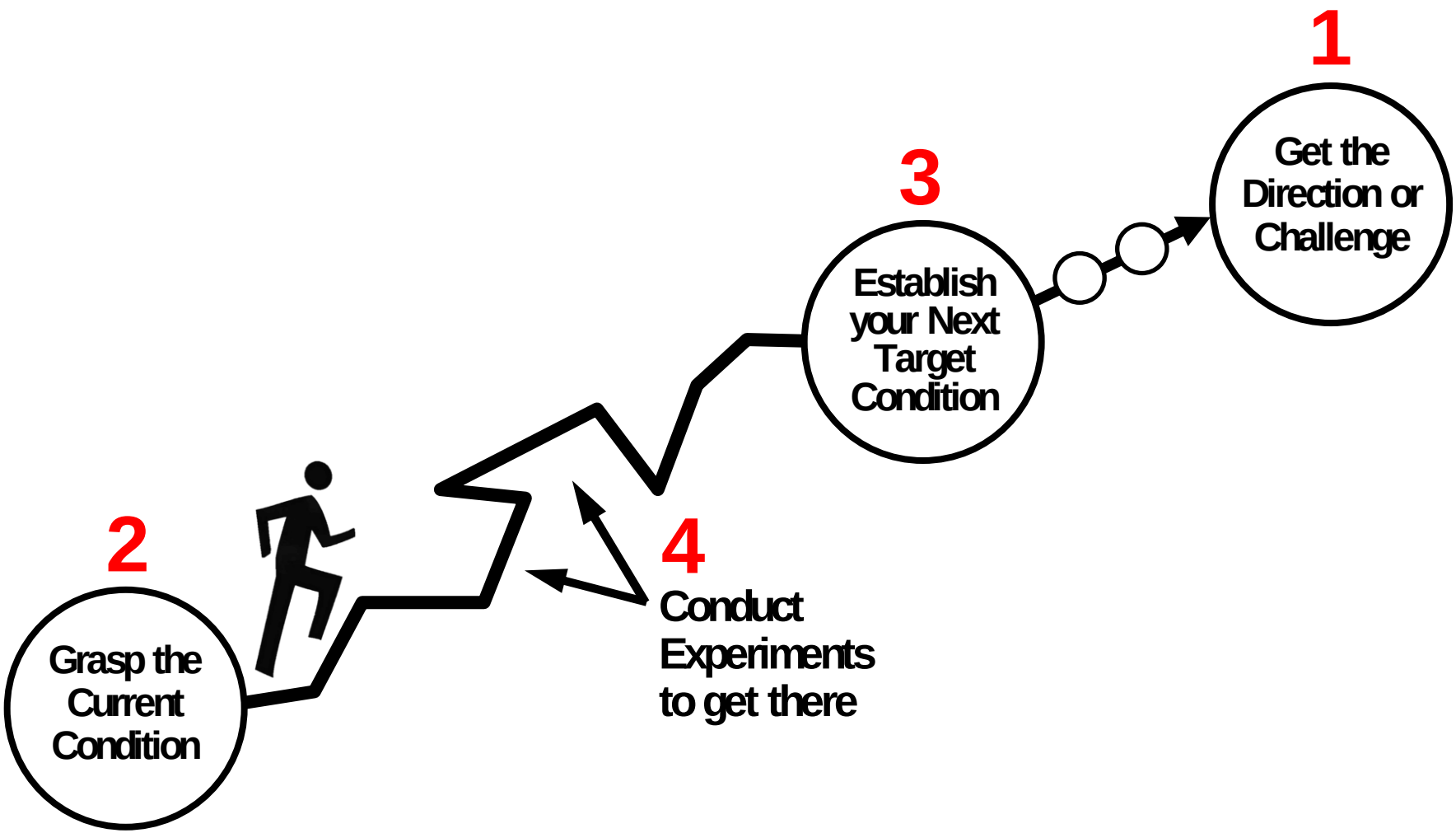

A Kata is a routine you practice, so it's pattern becomes a habit and gives you new skills
Mike Rother Ph.D.

Today we'll practice the pattern of the Improvement Kata

It's a routine you can use for achieving tough goals

Let's go through the four steps of the Improvement Kata

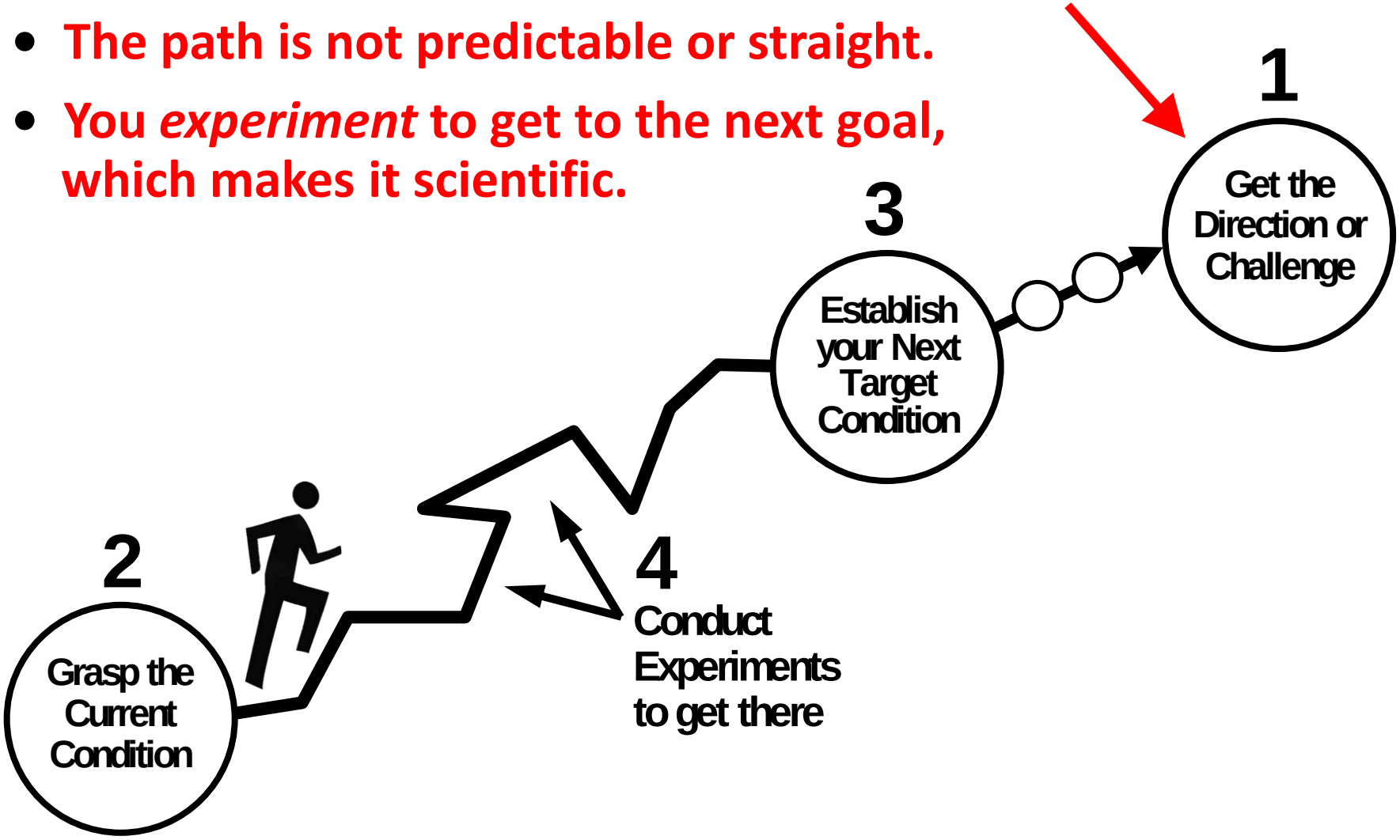
THE FOUR STEPS OF THE IMPROVEMENT KATA APPROACH



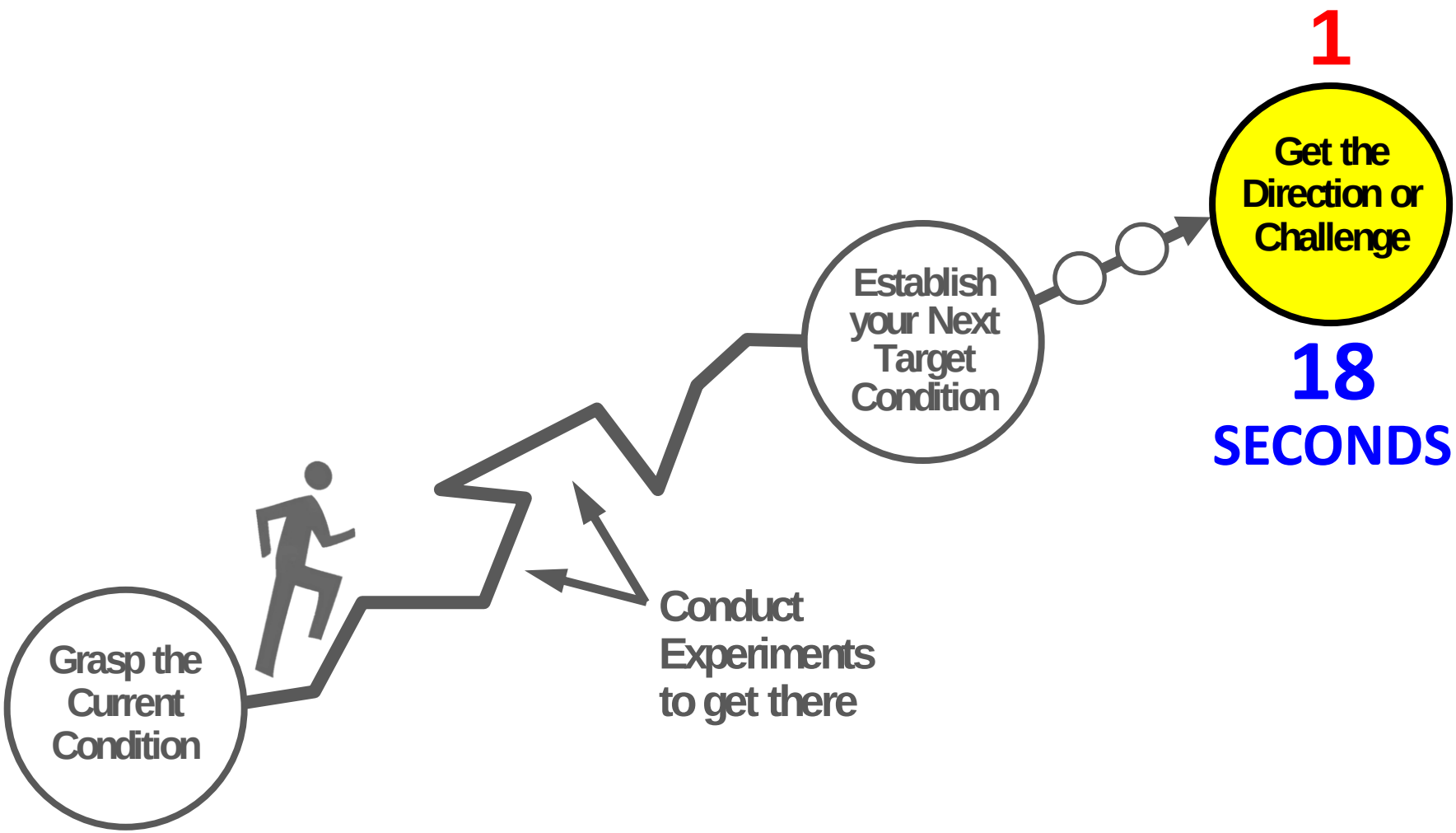
Mike Rother Ph.D.

SOME KEY POINTS

- You don't have to reach the overall challenge right away.
- The path is not predictable or straight.
- You *experiment* to get to the next goal, which makes it scientific.



Step 1:
UNDERSTAND THE CHALLENGE



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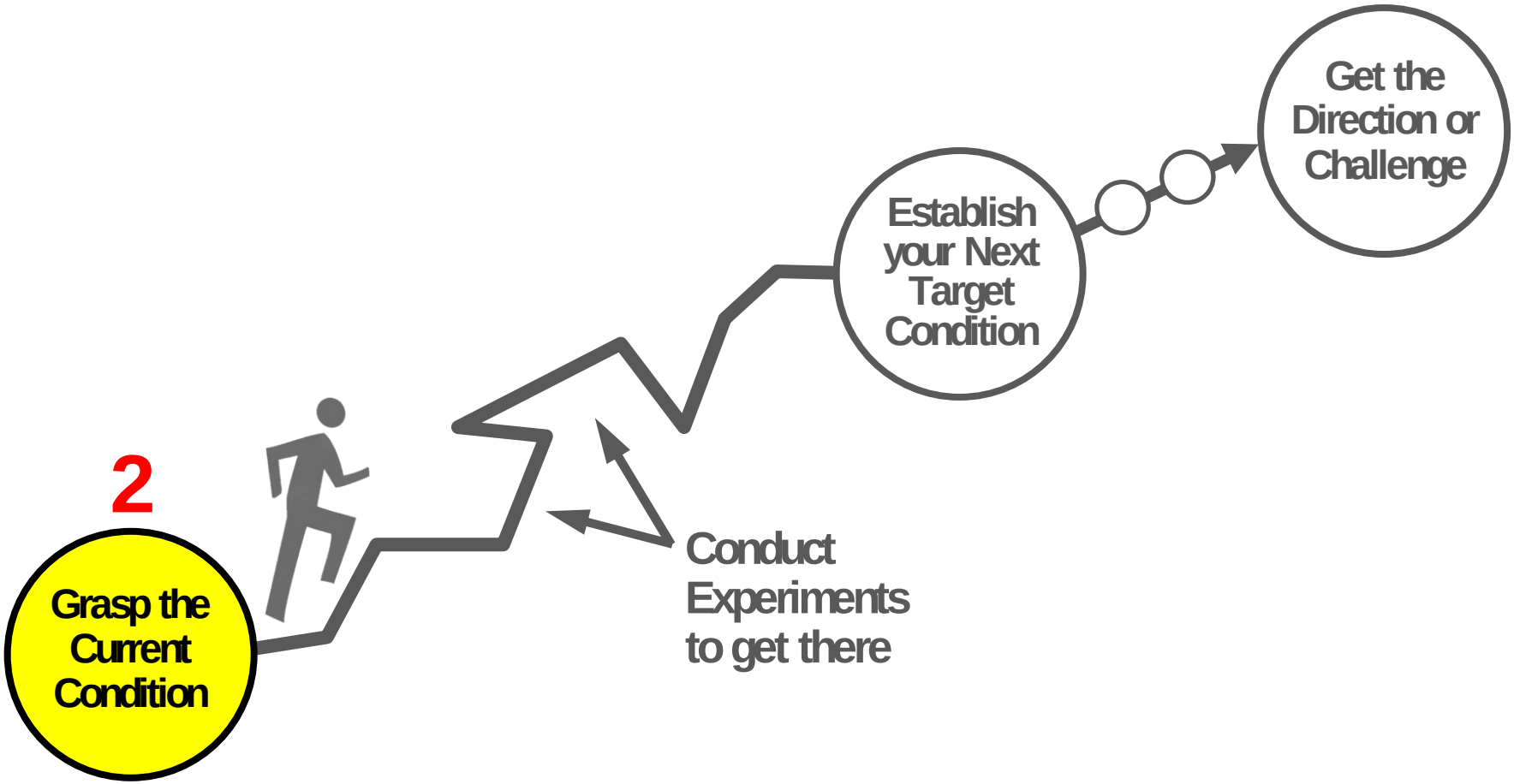
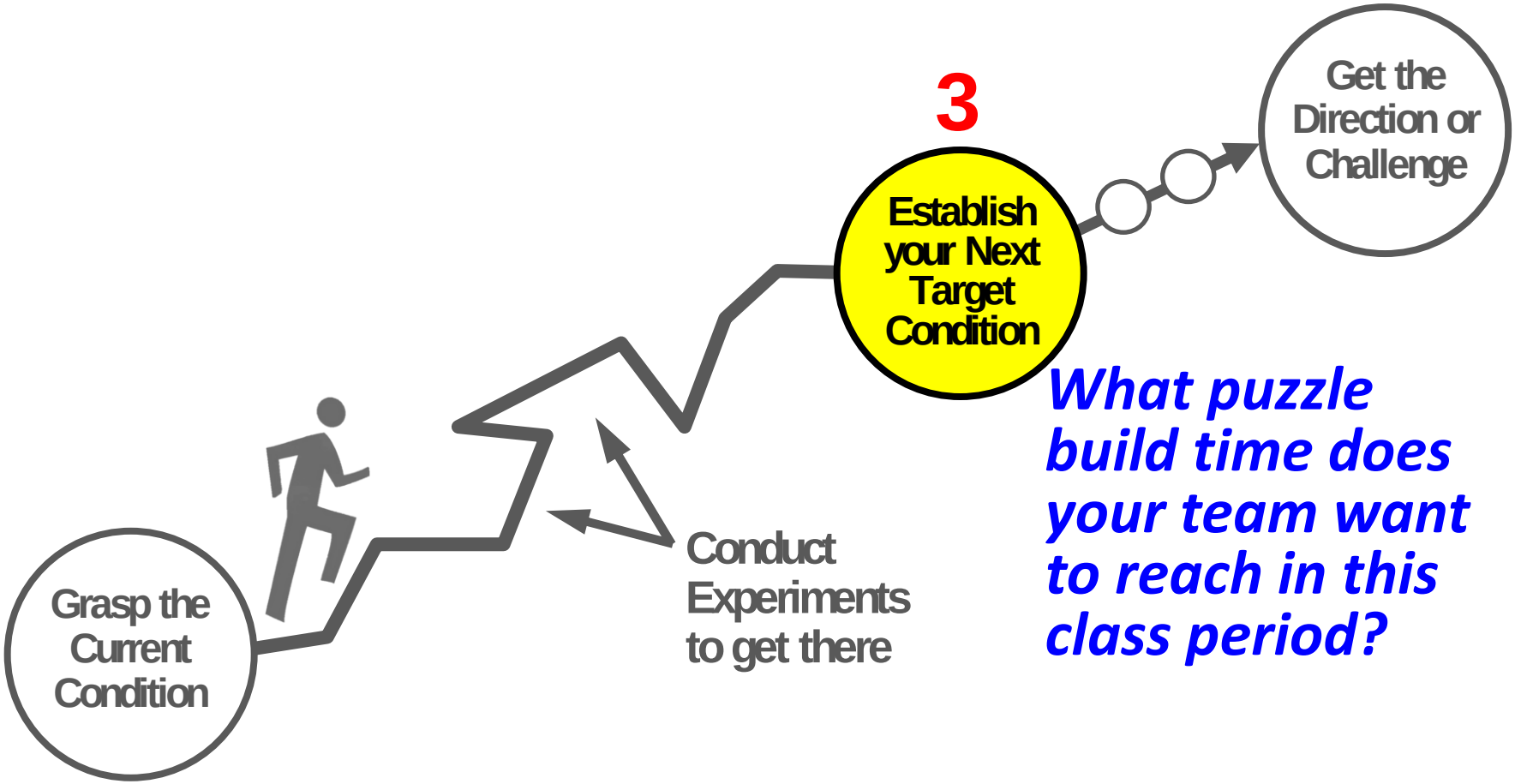
Step 2:
GRASP THE CURRENT CONDITION

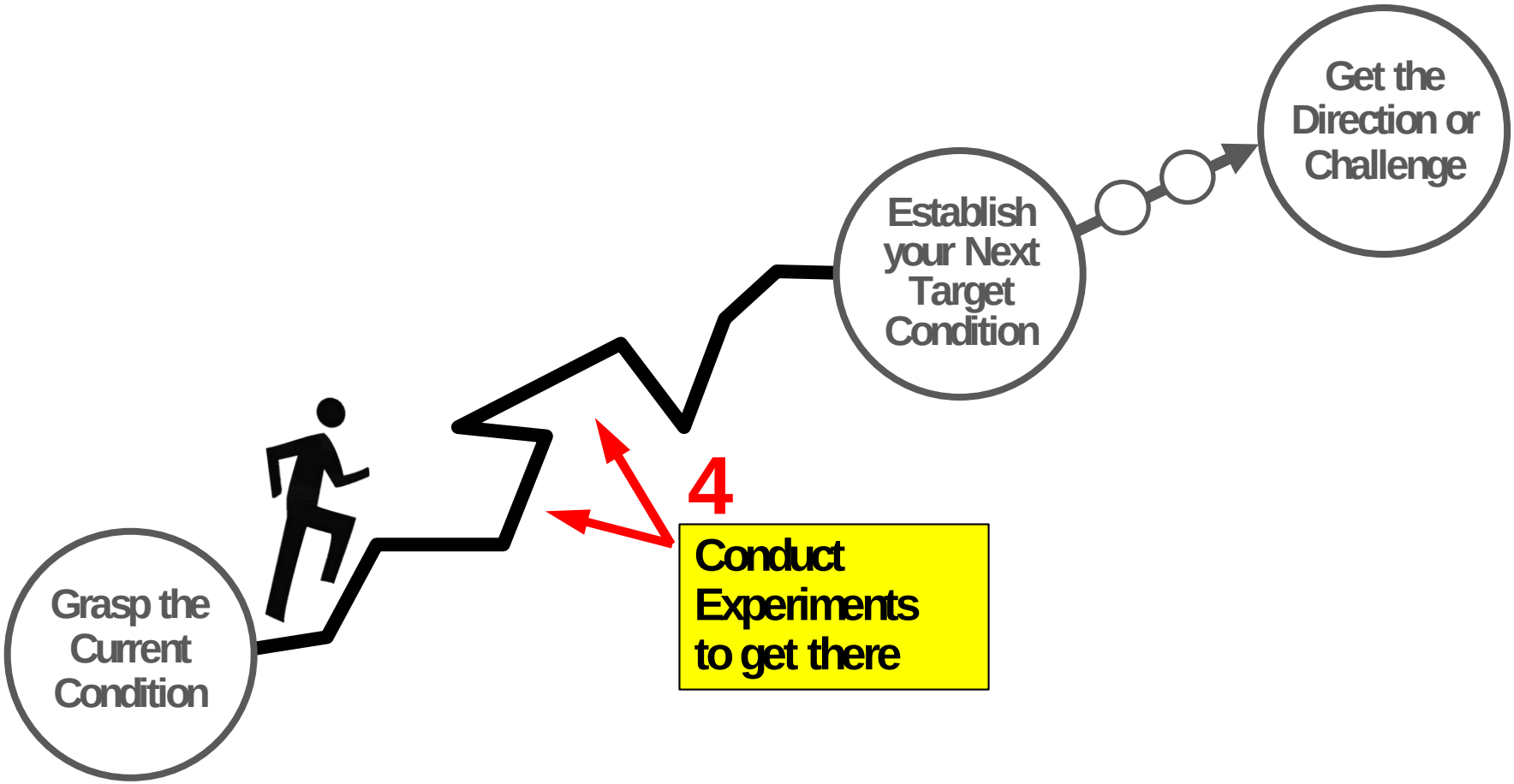


Step 3:
ESTABLISH YOUR NEXT TARGET CONDITION



What puzzle build time does your team want to reach in this class period?

Step 4:
CONDUCT EXPERIMENTS TO GET THERE



VIDEO

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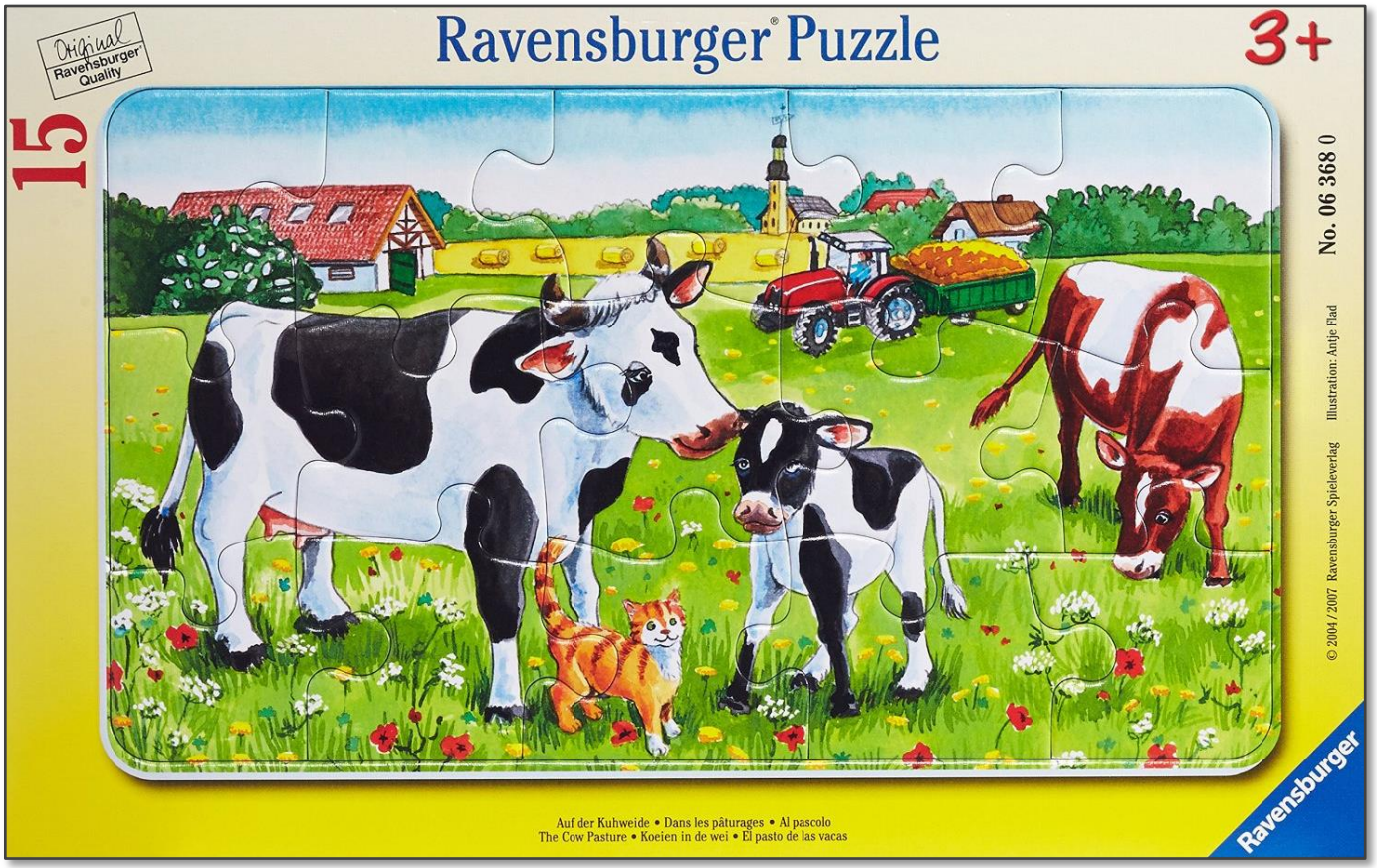
For this exercise we'll build this 15-piece puzzle several times, and measure how long it takes each time



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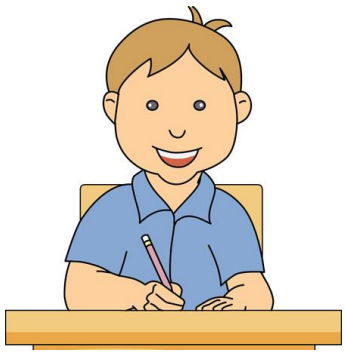
THREE THINGS TO DO NEXT

Choose a Team Name

Select a Timekeeper

→ Each gets a stopwatch

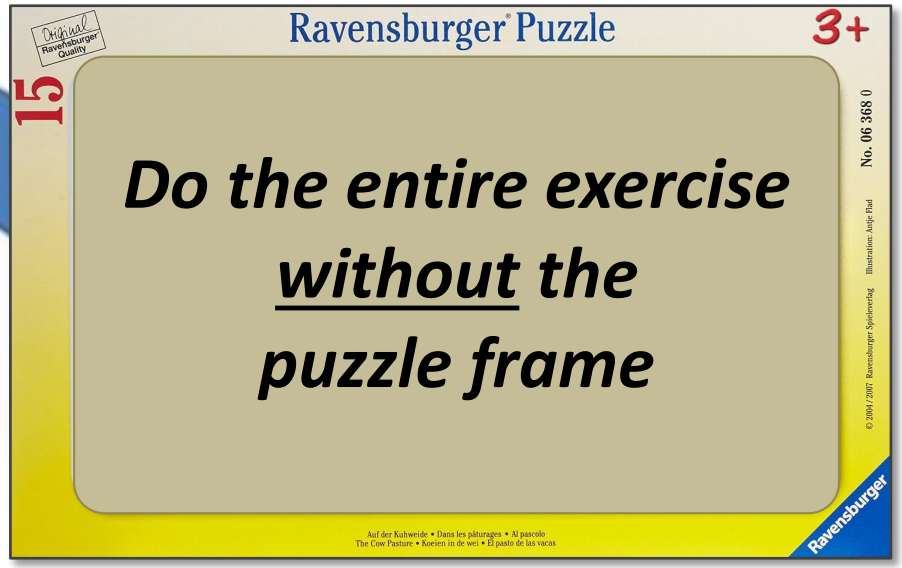


Select a Data Recorder

→ 'Baseline Rounds' form

- **Take the puzzle out of the bag and study the picture.**
- **Remove the puzzle pieces from the frame.**
- **Put the frame back in the bag.**

Put the Frame Aside



Now build the puzzle once!

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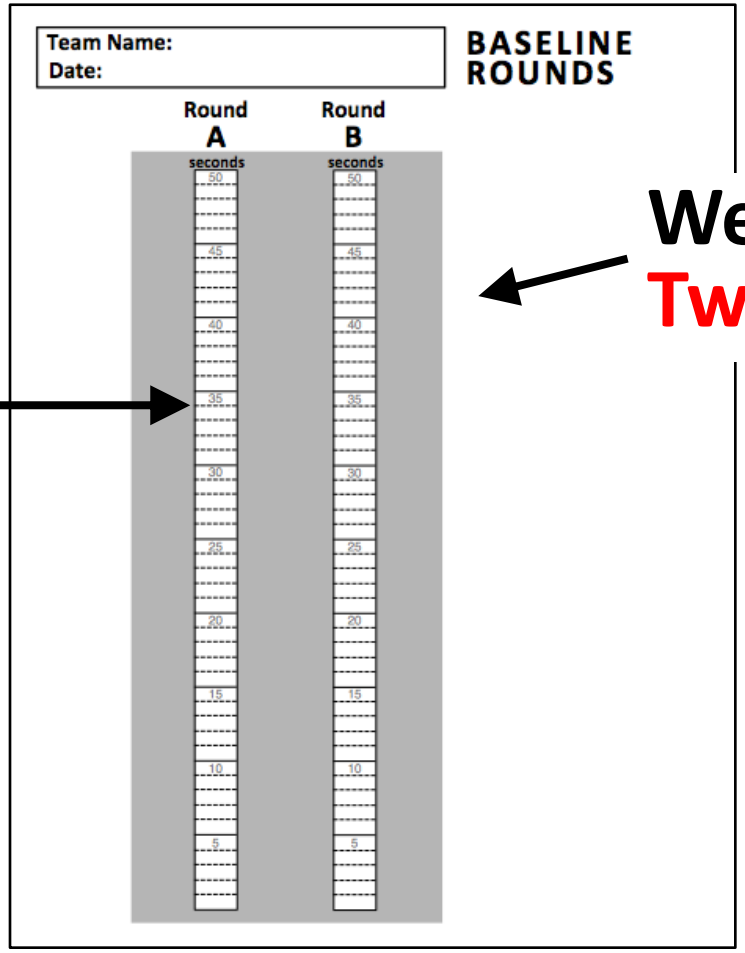
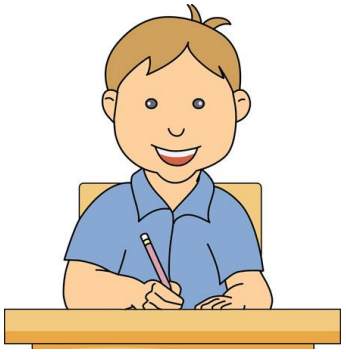
LET'S ESTABLISH A BASELINE TIME FOR YOUR TEAM

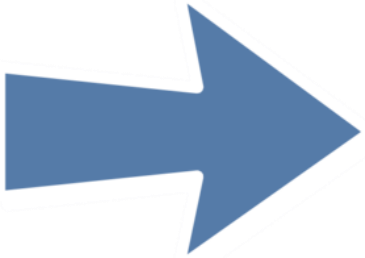


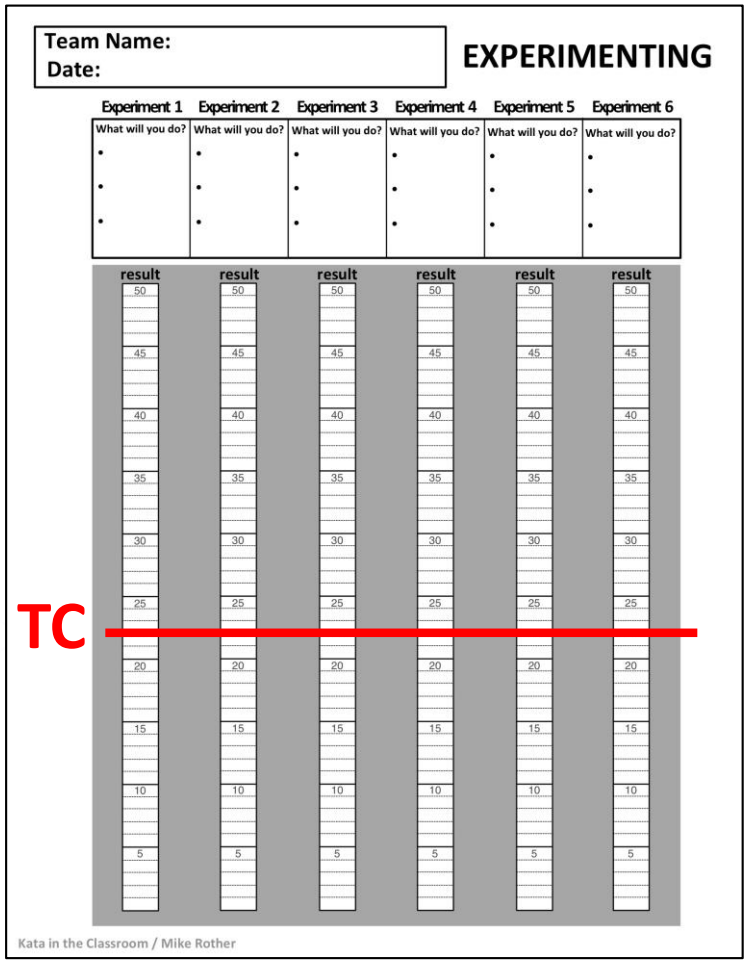
We'll run
Two rounds

Record your times here

DRAW YOUR TARGET CONDITION LINE ON THE 'EXPERIMENTING' FORM







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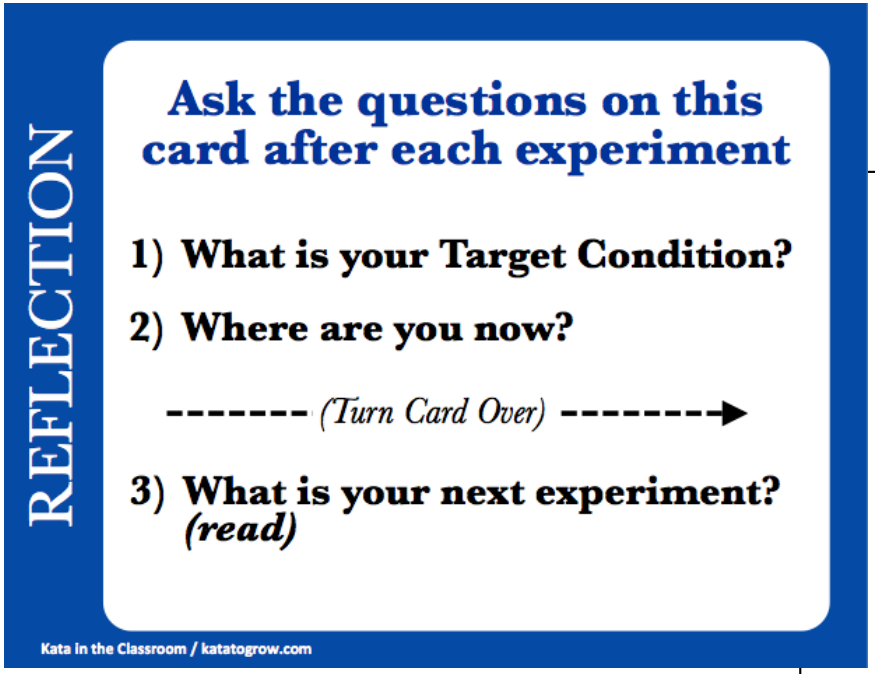
Key Points About:
GRASPING THE CURRENT CONDITION

- **It's important to understand where you currently are, before you set your next goal.**
- **Don't pull goals randomly out of the air. A team should feel like its goals are meaningful.**

REFLECTING ON EACH EXPERIMENT

After each round we'll ask one team this set of Reflection Questions



Back of Card

Reflect on the Last Step Taken

1) What did you plan to try in your last step? *(read)*
2) What happened?
3) What did you learn?

PLANNING YOUR NEXT EXPERIMENT

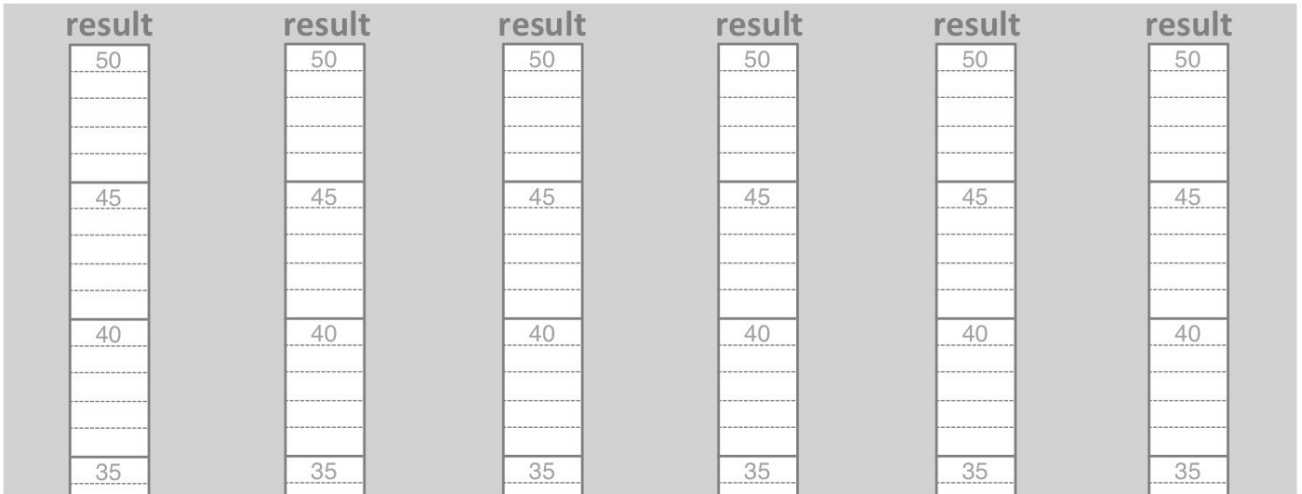
Before each round, write the ideas you want to test on your 'Experimenting' form

Team Name:
Date:

EXPERIMENTING

Experiment 1	Experiment 2	Experiment 3	Experiment 4	Experiment 5	Experiment 6
What will you do?	What will you do?	What will you do?	What will you do?	What will you do?	What will you do?
•	•	•	•	•	•
•	•	•	•	•	•
•	•	•	•	•	•

Write down the ideas for your first experiment



TODAY'S GROUND RULES

(1) "START Position" =

- Puzzle pieces shuffled in random order
- Pieces face down in one stack
- Hands flat on the table
- No talking

(2) All Teams Start Together

a. Instructor calls "START"
b. Build the puzzle
c. Note the elapsed time on your form

(3) Don't Write on the Puzzle

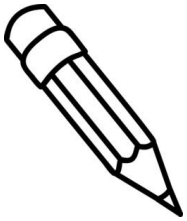
THE SEQUENCE FOR EXPERIMENTING

3 Minutes per Round + Reflection Questions

Instructor calls "START"
Build the puzzle
Note the elapsed time on your form

Discuss what you plan to do next
Write ideas you want to test onto the form

Time's up... Ask the Reflection Questions
Get into START Position (timekeeper raise hand)



What's Your Goal for Today?

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Summary

What are the four steps of the Improvement Kata approach?

Let's use this approach again when we have another challenge in class.