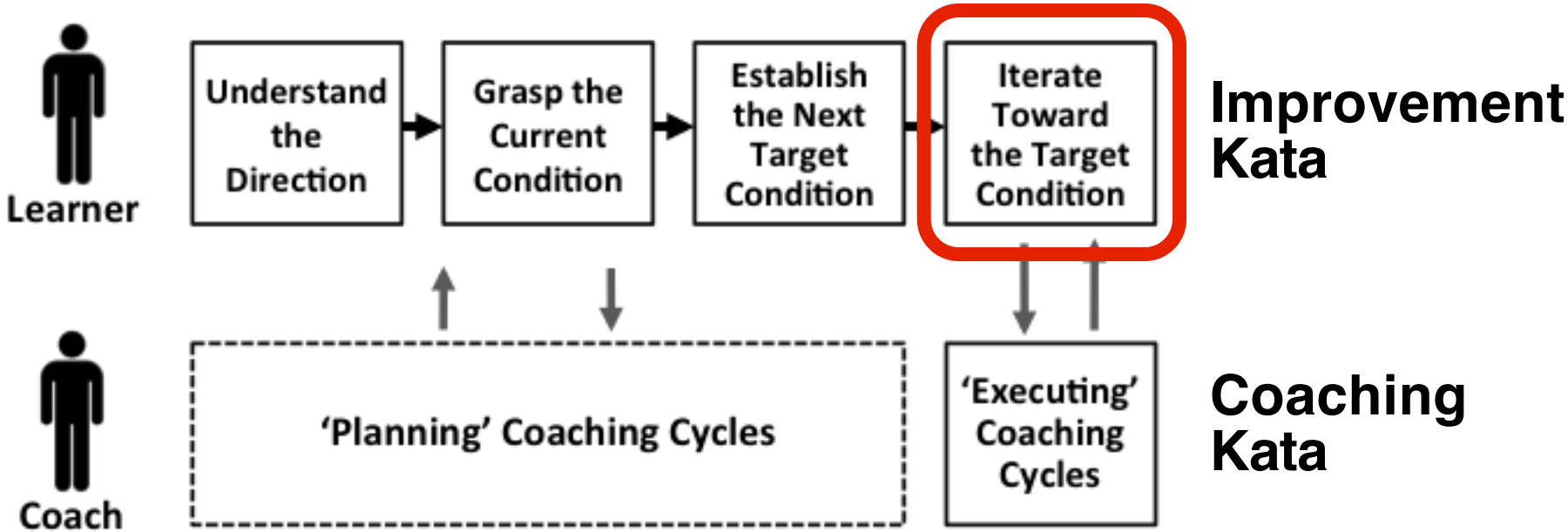
EXECUTING PHASE
How to Get There

Chapter 7. Step 4: Iterate Toward the Target Condition



TIME TO SHIFT GEARS

Having a next Target Condition (based on a grasp of the current condition and aimed at the challenge) is important, but great execution is equally important. If you have those two together then anything is possible.

This chapter of the Improvement Kata Handbook gives you starter routines (Kata) for practicing a highly-effective, scientific approach to execution.

In this phase the Learner moves toward the Target Condition iteratively though experiments, while the Coach accompanies the process via daily Coaching Cycles with the Five Coaching Kata Questions.

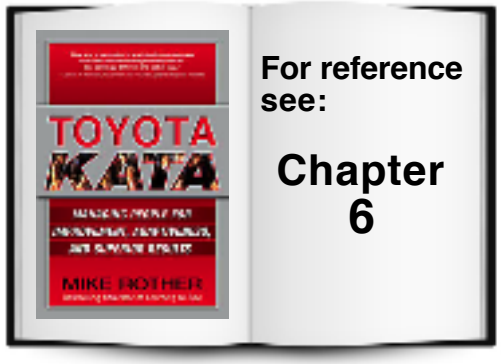
It's in this phase that the logic of the Improvement Kata pattern usually becomes clear to the beginner Learner. The "why" we are working this way becomes apparent sometime during the executing coaching cycles.

Chapter 7

The Improvement Kata - Executing Phase

Step 4: ITERATE TOWARD THE TARGET CONDITION

Practice this Routine



For reference see:

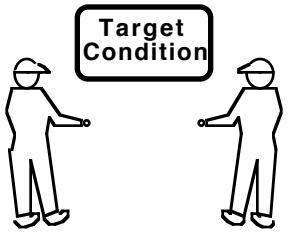
Chapter 6

ORIENTATION

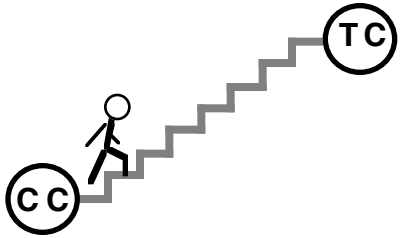
Understand the Direction

Grasp the Current Condition

Establish the Next Target Condition



Iterate Toward the Target Condition

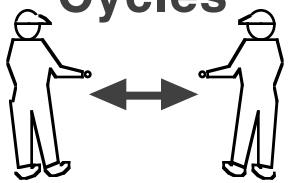


LEARNER

The discovery process between Current Condition and Target Condition

'Planning' Coaching Cycles

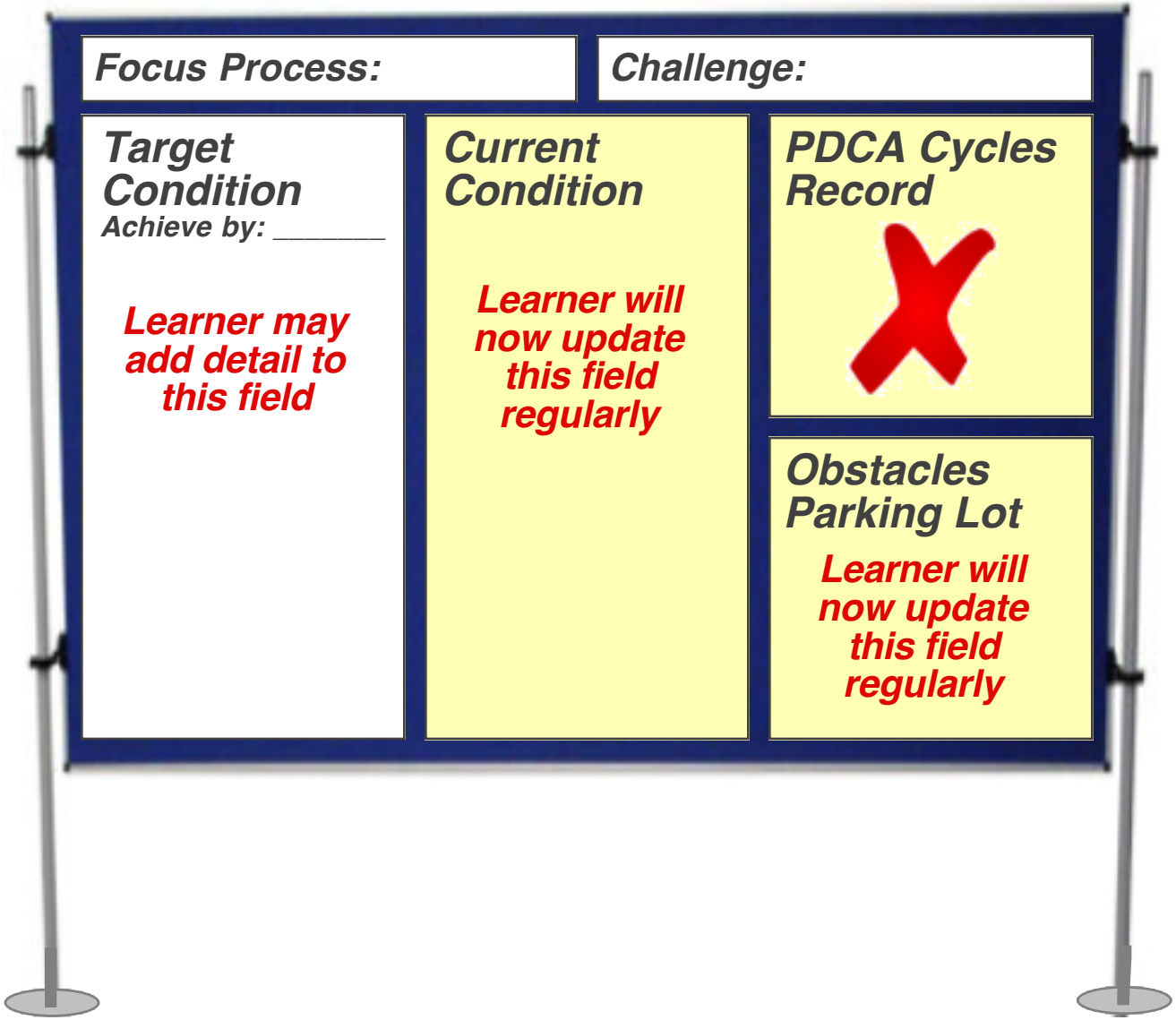
'Executing' Coaching Cycles



COACH

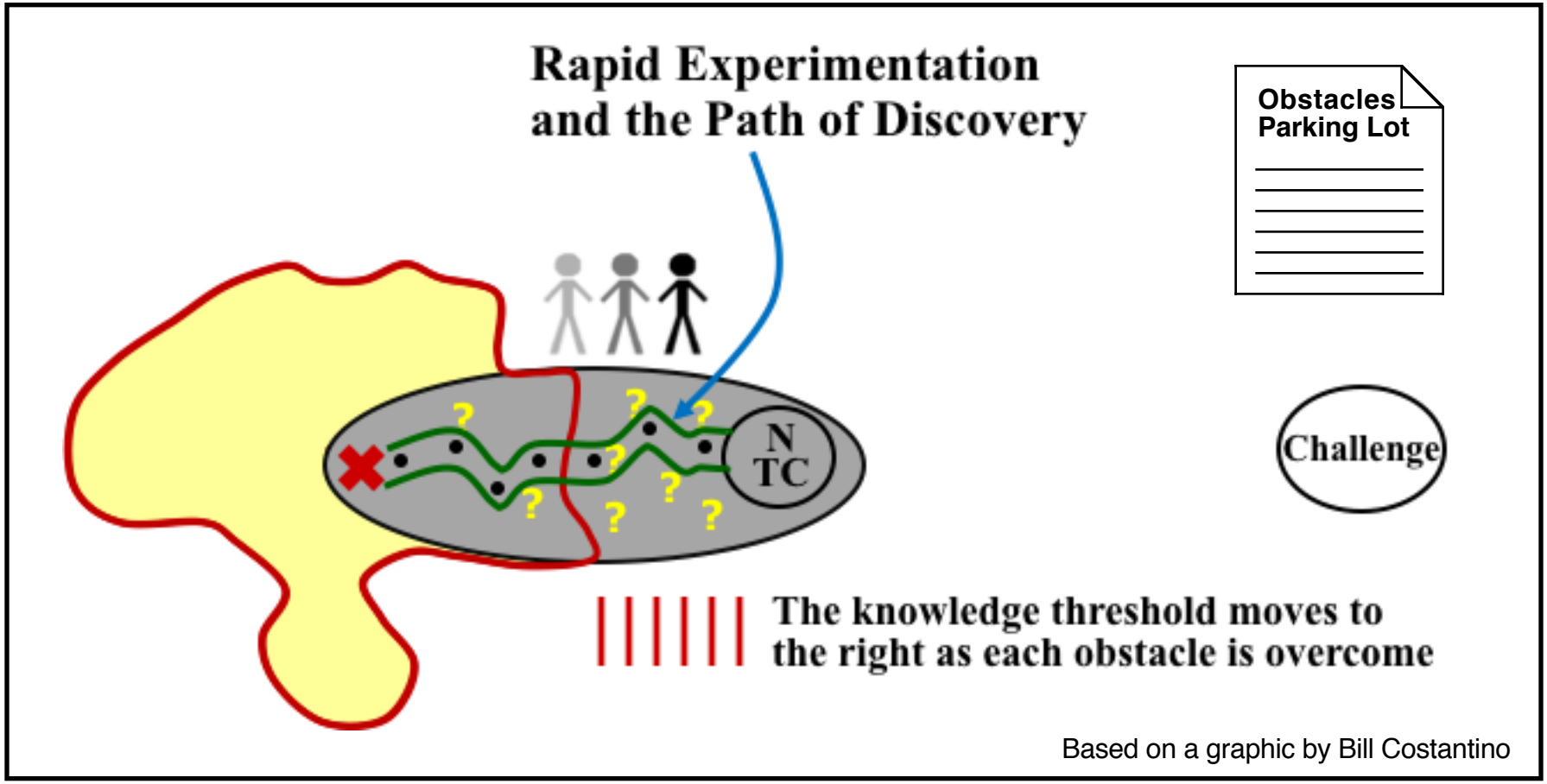
LEARNER'S STORYBOARD

The Learner is now concentrating on this field



Concept Overview

THIS CHAPTER GIVES YOU A STRUCTURED STARTER ROUTINE TO PRACTICE, THAT HELPS ANYONE LEARN HOW TO CONDUCT EXPERIMENTS THE RIGHT WAY



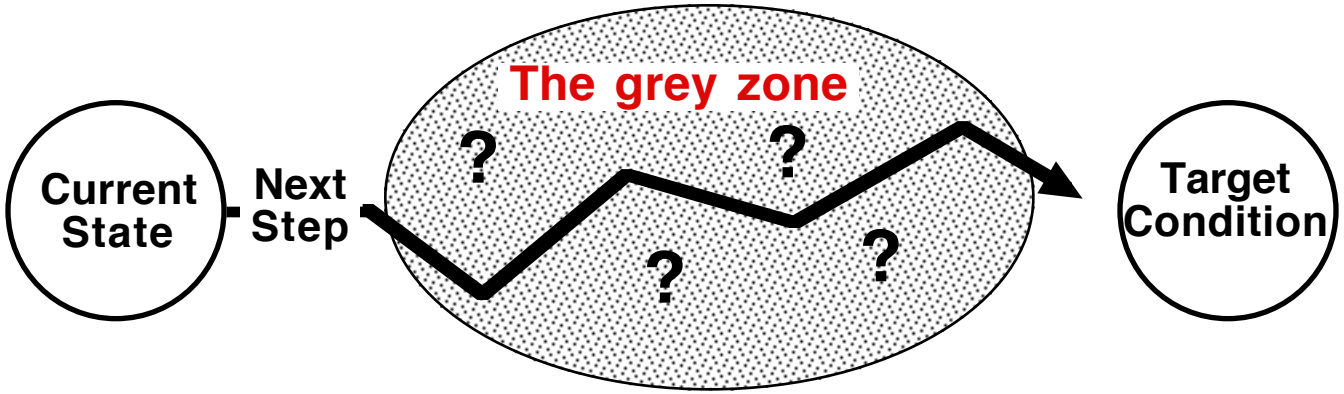
NOW THAT YOU HAVE A TARGET CONDITION, HOW DO YOU GET THERE?

Most Important:
ASSUME THE PATH IS UNCLEAR

Be open to steps other than those you thought would get you there

We make plans and intend to execute them. But reality is neither linear nor predictable enough for this alone to be an effective means for achieving our Target Conditions.

With complex, dynamic systems we cannot plan or aim so well up front as to hit the Target Condition. Regardless of how well you planned, the path to achieving the Target Condition is somewhat of a grey zone.



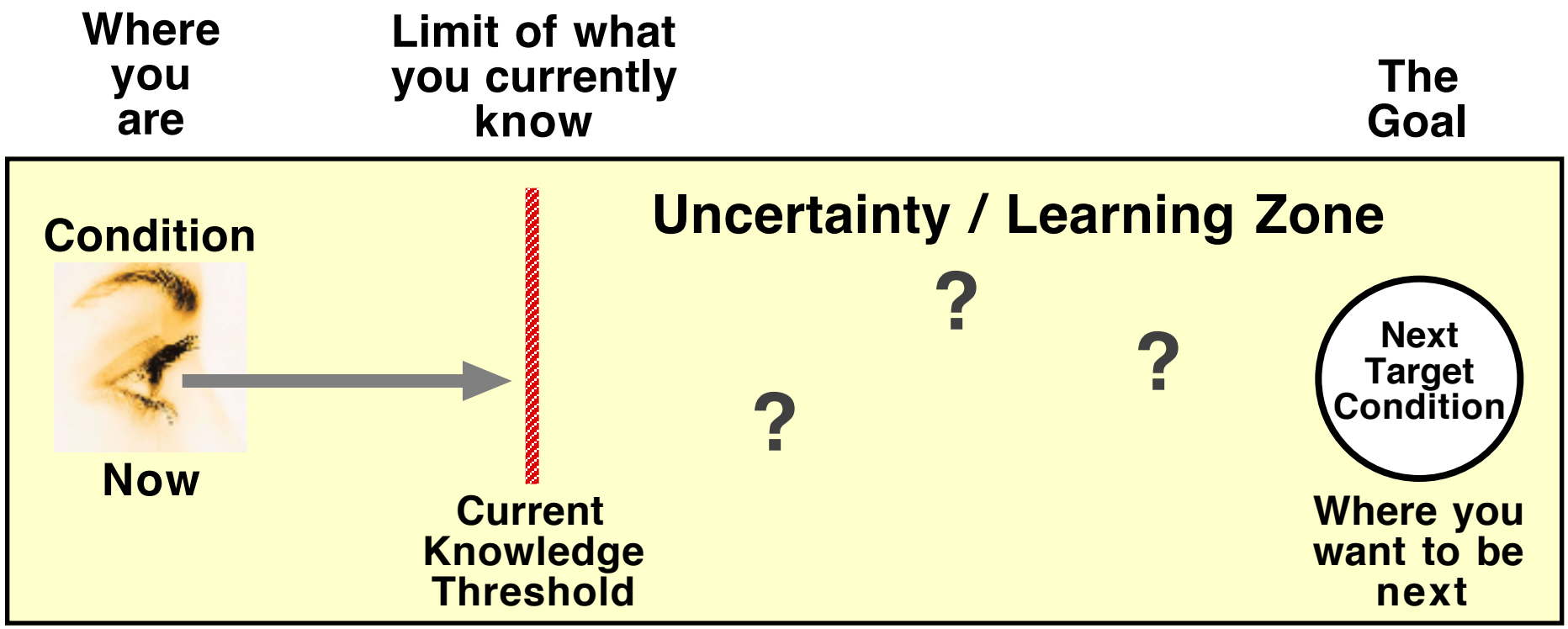
The Target Condition you established in the last step is the setup and frame for experimenting -- at the point of your *advancing* Threshold of Knowledge. Progressing to the Target Condition boils down to acknowledging knowledge thresholds, testing, being receptive to learning and marshalling your team's ingenuity to adapt based on what you learn. This is the action of innovation!

TIME TO PUT ON YOUR SCIENTIST HAT...

...AND WATCH FOR KNOWLEDGE THRESHOLDS

WHAT'S THE *THRESHOLD OF KNOWLEDGE*?

It's the point at which you have no facts & data and start guessing



There's <u>always</u> a knowledge threshold, and it's closer than you think!

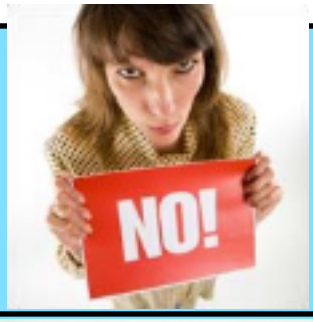
You never know for sure how you are going to get there until you get there.

SCIENTIFIC THINKING MEANS LEARNING ALONG THE WAY TO THE TARGET CONDITION

Since the path to a challenging goal can't be predicted with exactness, we have to find that path by experimenting like a scientist. With each step and insight a scientist may adjust his or her thinking based on what has just been learned.

The scientific process can't tell us what's ahead. It only confirms or refutes the results of experiments.

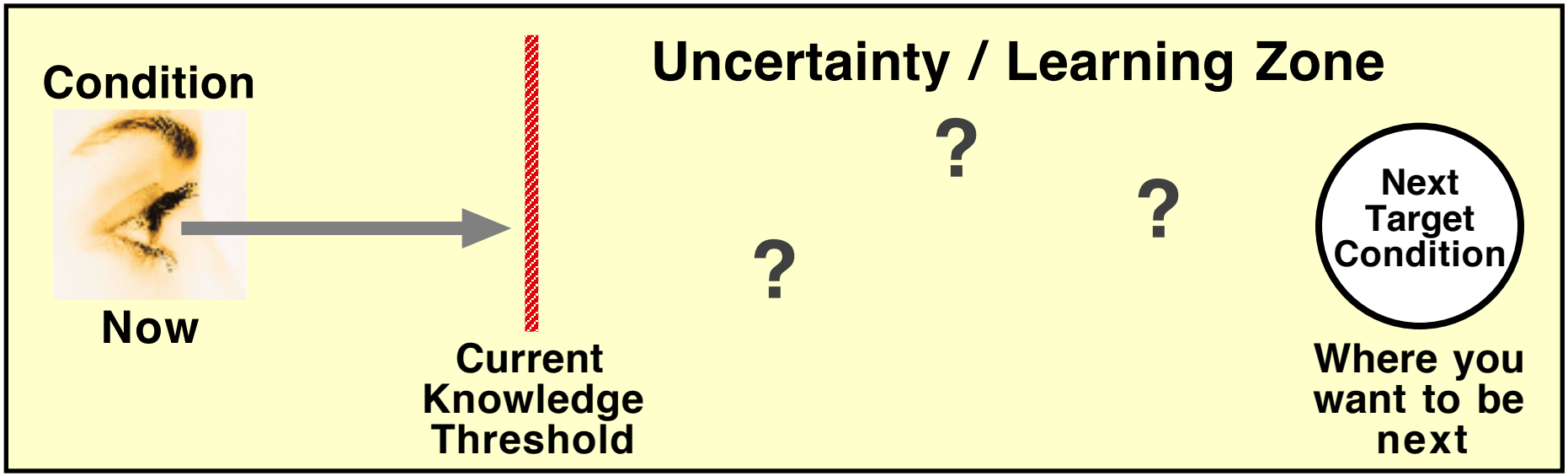
A trick to making effective progress toward a challenging target condition is not to try to *decide* the way forward, but to *iterate* your way forward by experimenting as cheaply and rapidly as possible. This is the *action of innovation*.

What we may think *scientific thinking* is	**Objective and certain:** ***"We have made the right plan"***	
What *scientific thinking* really is	**Always provisional:** ***"Our plan is a hypothesis"***	

WHAT SHOULD YOU DO AT THE THRESHOLD OF KNOWLEDGE?

1) **Acknowledge it.** (Difficult to do, until you get in the habit.) Key realization: There's always a threshold of knowledge.

2) **Stop and see further by conducting an experiment.** Don't deliberate over answers. Deliberate over the next experiment: ***What do we need to learn next, how will we test that and how will we measure it?***

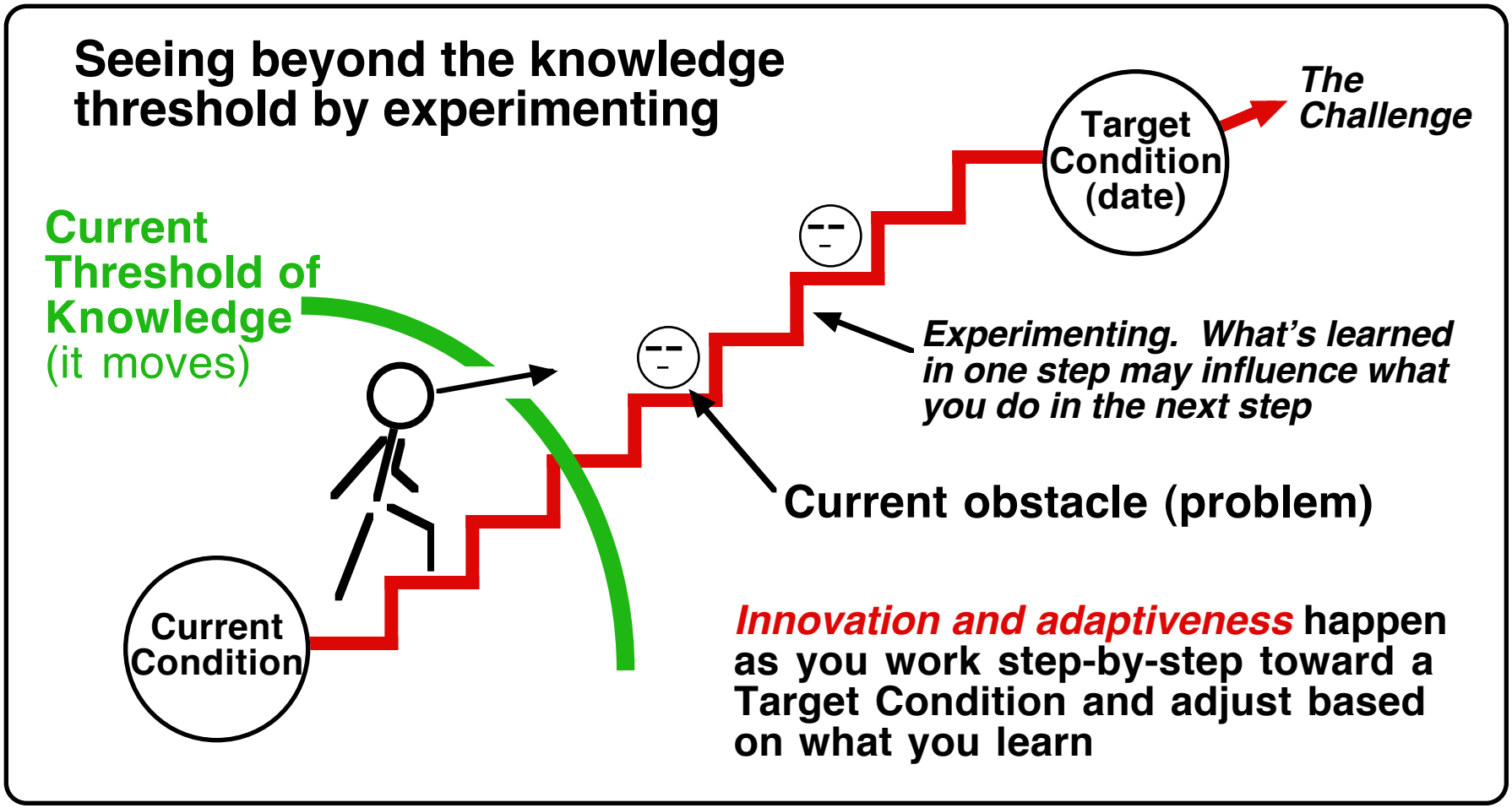


The path can't be determined in advance through logic and debate

HOW TO WORK TOWARD THE TARGET CONDITION

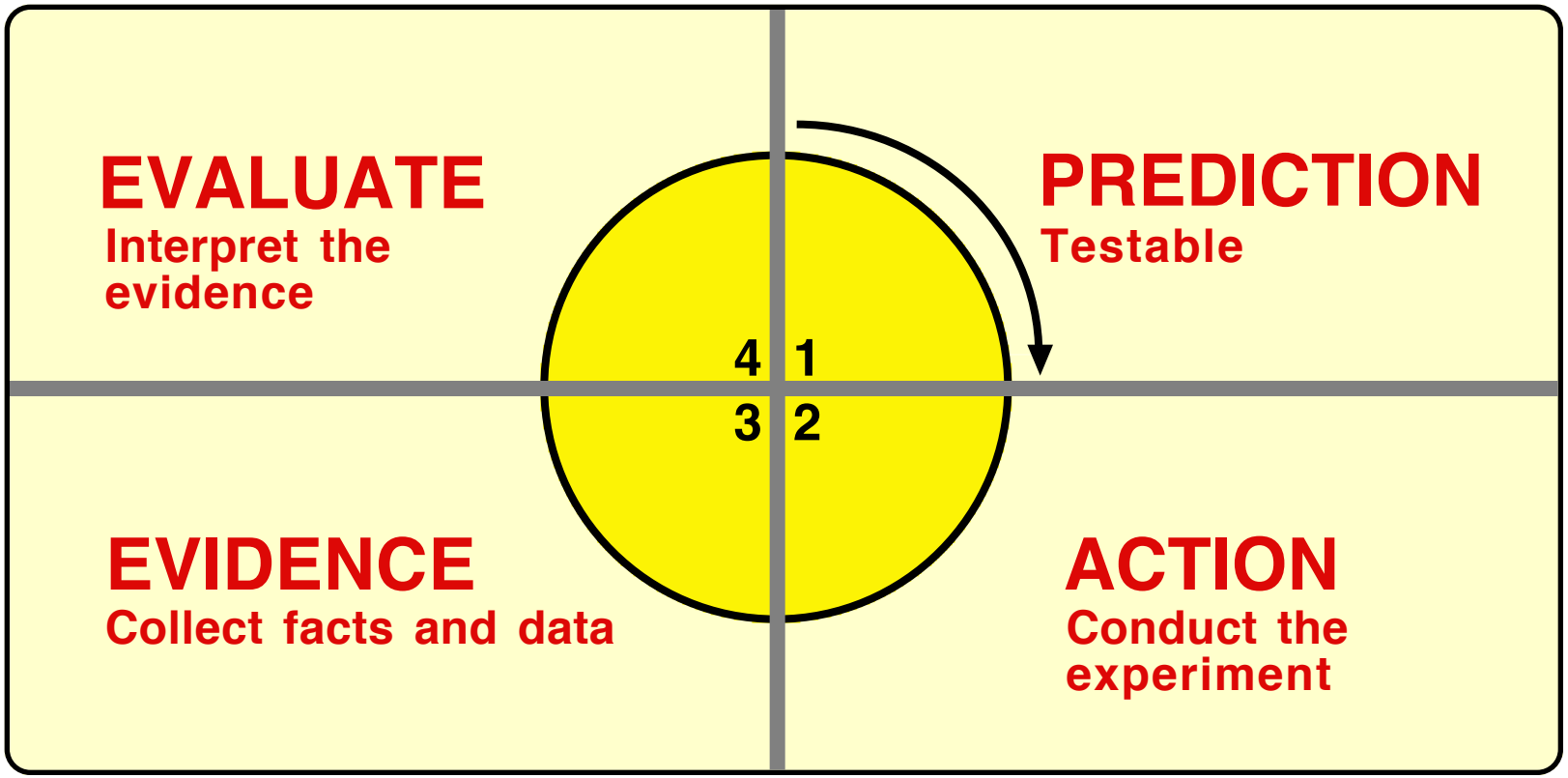
Step at a time, with learning and adjustments along the way

With the Improvement Kata you learn as you strive to reach the Target Condition, and adapt based on what you're learning. Find the route to the Target Condition by learning from experiments and focusing on the next step based on that learning. This is how the adaptive "Learning Organization" becomes a reality.



IT'S THE SCIENTIFIC LEARNING CYCLE

Which is the scientific process of acquiring knowledge

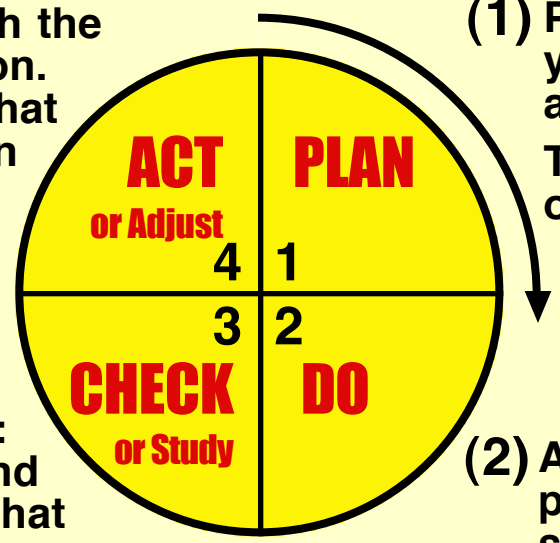


This cycle gives you a practical way to reach a Target Condition, by providing a systematic way of working through the uncertain 'grey zone' between here and there.

THIS CYCLE OF ITERATION IS OFTEN CALLED:

"Plan-Do-Check-Act" (PDCA)
-- or --
"Plan-Do-Study-Adjust" (PDSA)

(4) **EVALUATE:** Compare the actual outcome with the plan and expectation. Adjust based on what you learn and begin the PDCA cycle again. Standardize and stabilize what works.



(1) **PREDICTION:** Define what you are going to do next and what you expect.

This is the hypothesis or theory.

(3) **EVIDENCE:** Observe and measure what happens.

(2) **ACTION:** Test the prediction, ie. take the step according to the plan.

Let's take a closer look at how PDCA actually works...

THREE KEY POINTS ABOUT PDCA

Key Point
1
about
PDCA

PDCA IS NOT ABOUT IMPLEMENTING SOLUTIONS

It's about learning what you will need to do to reach your Target Condition

You and your team may think that nearly every step you take should bring a measureable benefit. Ironically, this mindset keeps you in the predictable zone and prevents you from really improving, adapting and innovating. You're only working with what you already know or think.

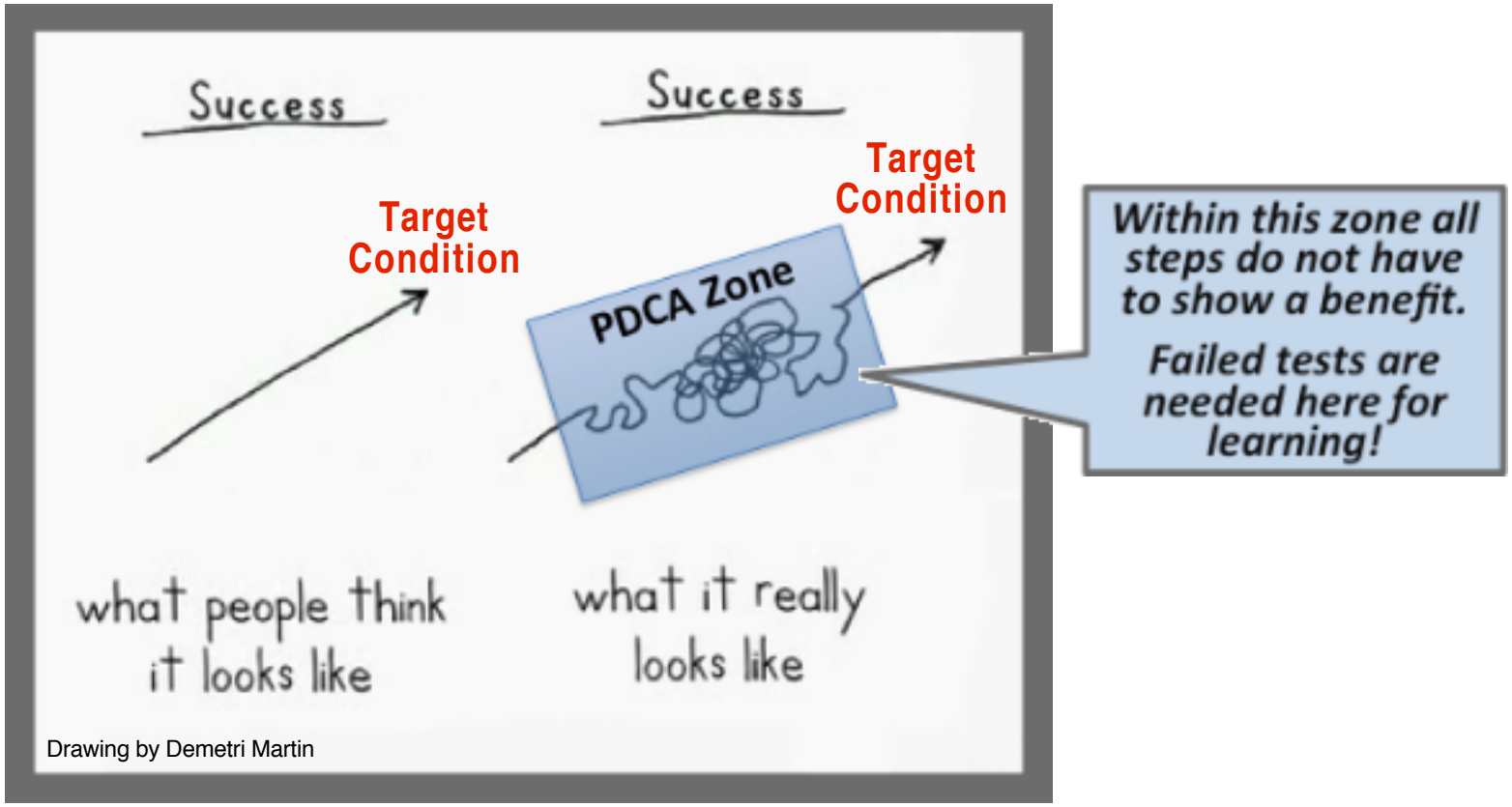
In the scientific approach, every step does not bring a measureable benefit. Rather, it's the <u>Target Condition</u> (which has an achieve-by date and is measureable) that carries the benefit. The steps you take are the *learning process* you go through for getting there.

THE PATH TO THE TARGET CONDITION WILL NOT BE A STRAIGHT LINE

The PDCA procedure is specified, but the path is not. Things will occur along the way that shift your thinking and cause you to revise your ideas. That's normal. The target condition remains the same, but the path shifts as you learn.

Failed predictions along the way are useful discoveries that show you what you need to focus on to achieve the target condition by the achieve-by date, and lead you to the next step. With each experiment the Learner learns a little more about what s/he needs to do to reach the target condition.

There must be room to make small errors and learn things along the way



Key Point 2 about PDCA

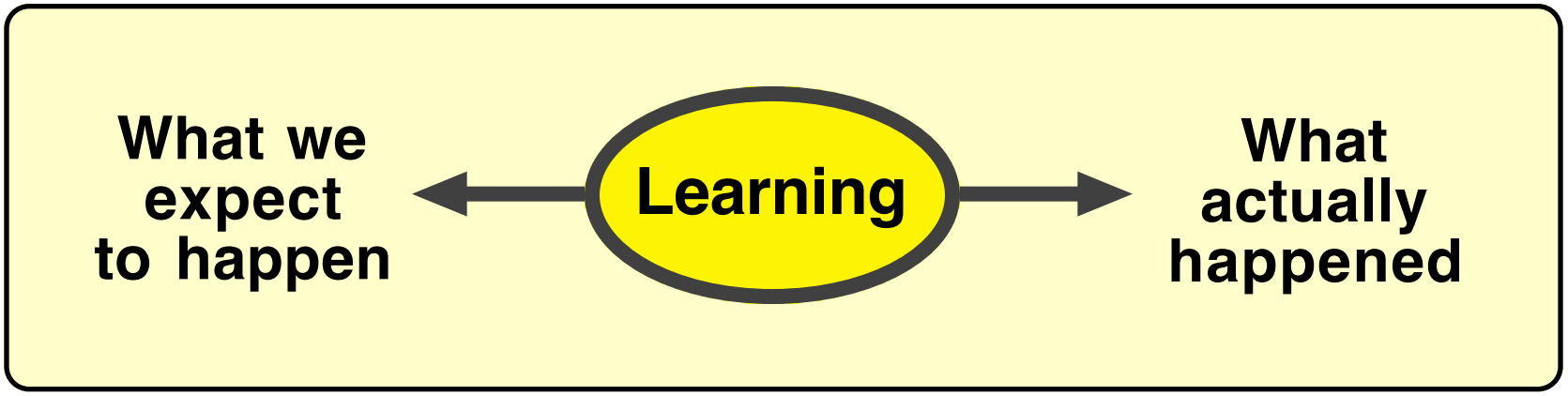
PREDICTION ERROR, OR *SURPRISE* IS A BIG PART OF HOW PDCA HELPS YOU LEARN AND IMPROVE

Unexpected results (surprises) are very effective in driving learning. The Improvement Kata process seeks to use these lessons.

When a hypothesis is refuted this is in particular when you can gain new insight that helps you learn, improve, adapt and innovate. The purpose of PDCA is to generate surprises and thus opportunities for learning & progress toward the target condition.

THE CORE DYNAMIC OF SCIENTIFIC THINKING

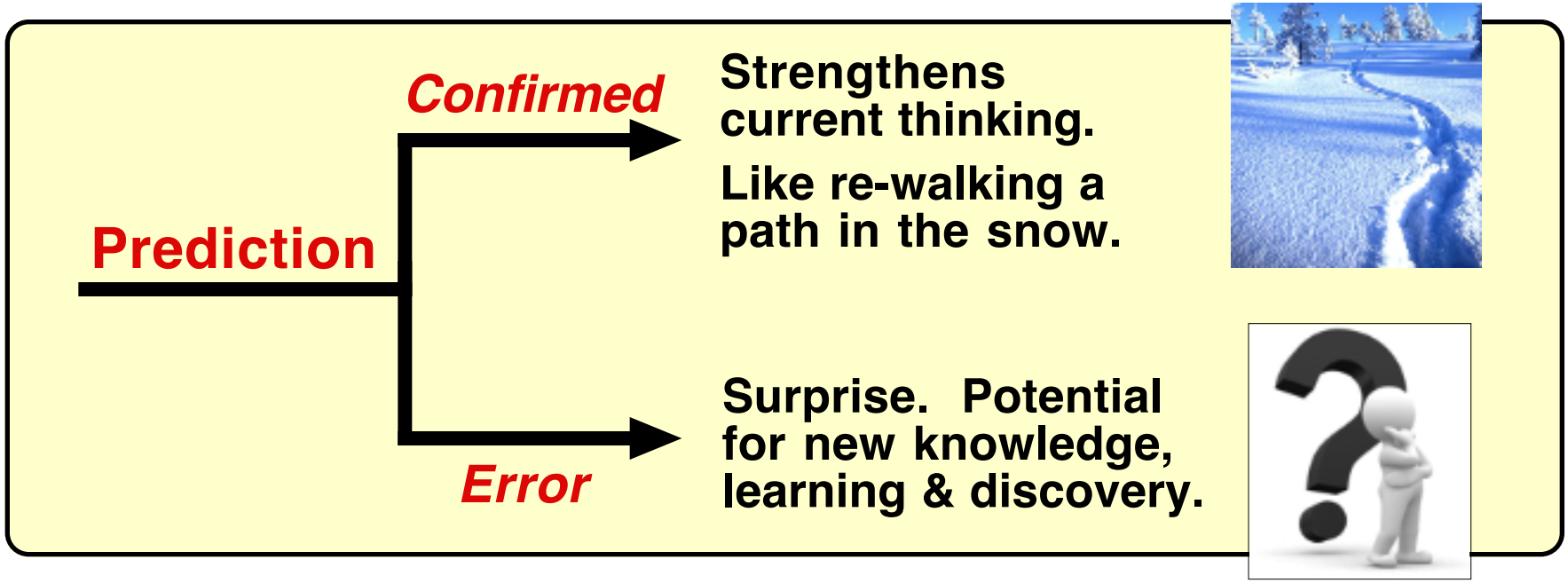
Scientific thinking is a routine of intentional coordination between what we think will happen (theory), what actually happens (evidence), and learning from the difference. This is the dynamic that allows you to reach challenging new goals through unclear territory.



Of course, you need to be able to measure your experiment, so you can compare your prediction with the actual outcome.

HOW PREDICTION ERROR HELPS YOU PROGRESS TOWARD THE TARGET CONDITION

When a result is as-predicted it confirms something you already thought. When a result is *different* than predicted you are about to learn something new.



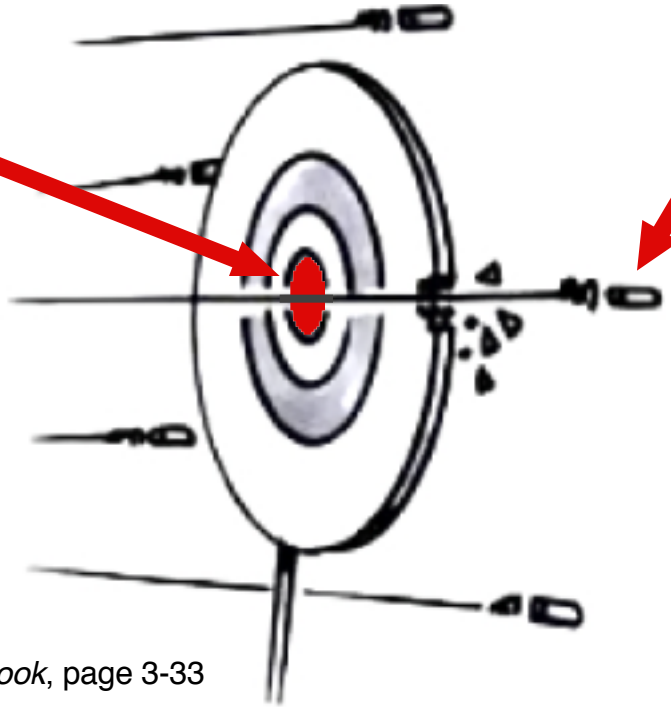
Prediction confirmation holds you in place, while prediction error leads you out of your assumptions and forces exploration. When experimentation is done right, small failures often provide new insight that advance your design.

"If the result confirms the hypothesis, then you've made a measurement.
If the result is contrary to the hypothesis, then you've made a discovery." ~ Enrico Fermi

WE LEARN FROM REFUTED HYPOTHESES

The "P" of PDCA is an expectation or a prediction...

...a *hypothesis*



The "C" of PDCA is a reflection...

What are we learning from this?

What do we need to adjust?

Illustration from *The Team Handbook*, page 3-33

A refuted hypothesis is useful because it impels you to challenge your beliefs, learn and adjust your approach. Unexpected results redirect your thinking, forcing new interpretations and steps. When you reflect and attempt to understand why your prediction was inaccurate you discover new insights and build new knowledge.

This is because a refuted hypotheses reveals a *knowledge threshold.* When something other than what you predicted happens -- when a plan, step, belief or hypothesis turns out to be incorrect -- it makes a knowledge threshold <u>visible</u> & puts you at the *learning edge.*

YOU NEVER ACTUALLY KNOW WHAT THE RESULT OF A STEP WILL BE

This is a key mindset to learn

A foundation of the Execution phase of the Improvement Kata is that whatever you think will happen with the next step is capable of being disconfirmed by evidence from taking that step. Without this capability there is little reason for conducting experiments.

Try to think of yourself as conducting experiments for the purpose of reconciling the new evidence you get from the experiment with what you were thinking when you planned the step. If you plan and take steps only to make something happen, rather than to test and potentially revise an idea, then your knowledge threshold won't change.

In an experiment you're primarily looking for facts and data that poke holes in your idea, not for confirmation of your idea. This may seem counterintuitive, but once you practice it will make sense and can be of great use.

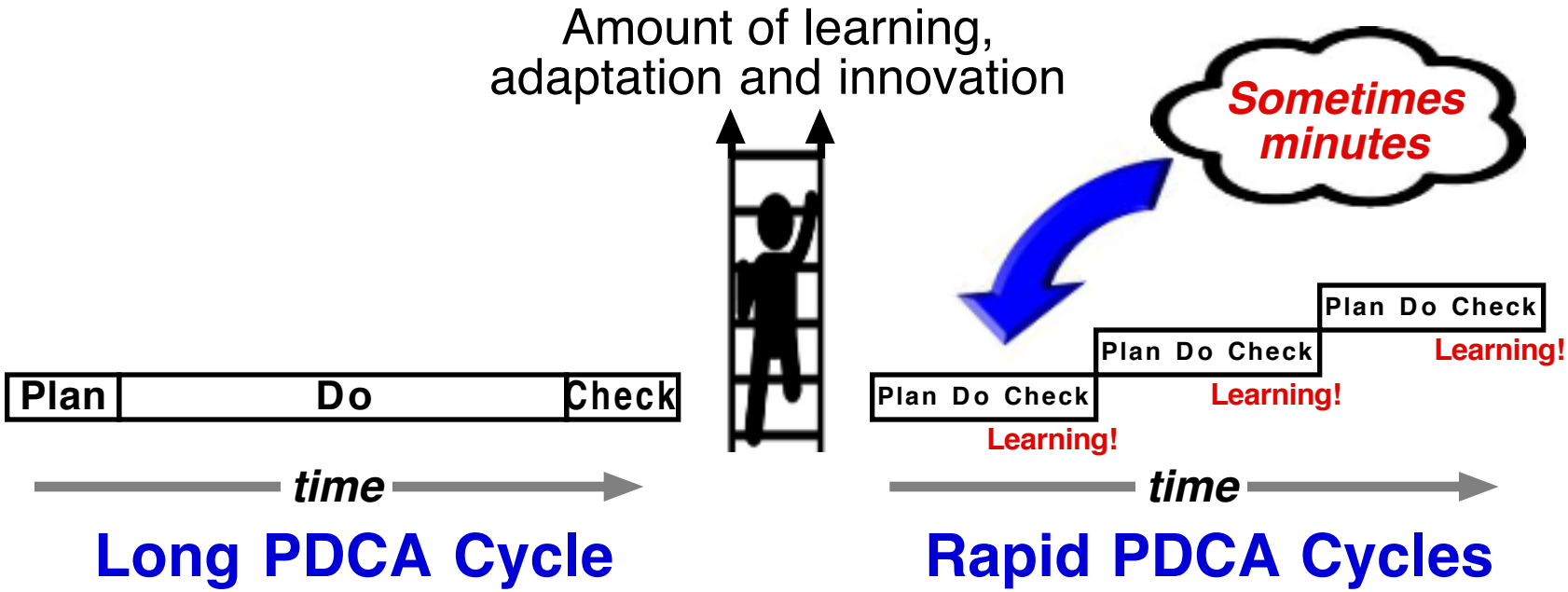
Key Point 3 about PDCA

RAPID & FREQUENT EXPERIMENTS = MORE LEARNING

Learn early, learn often

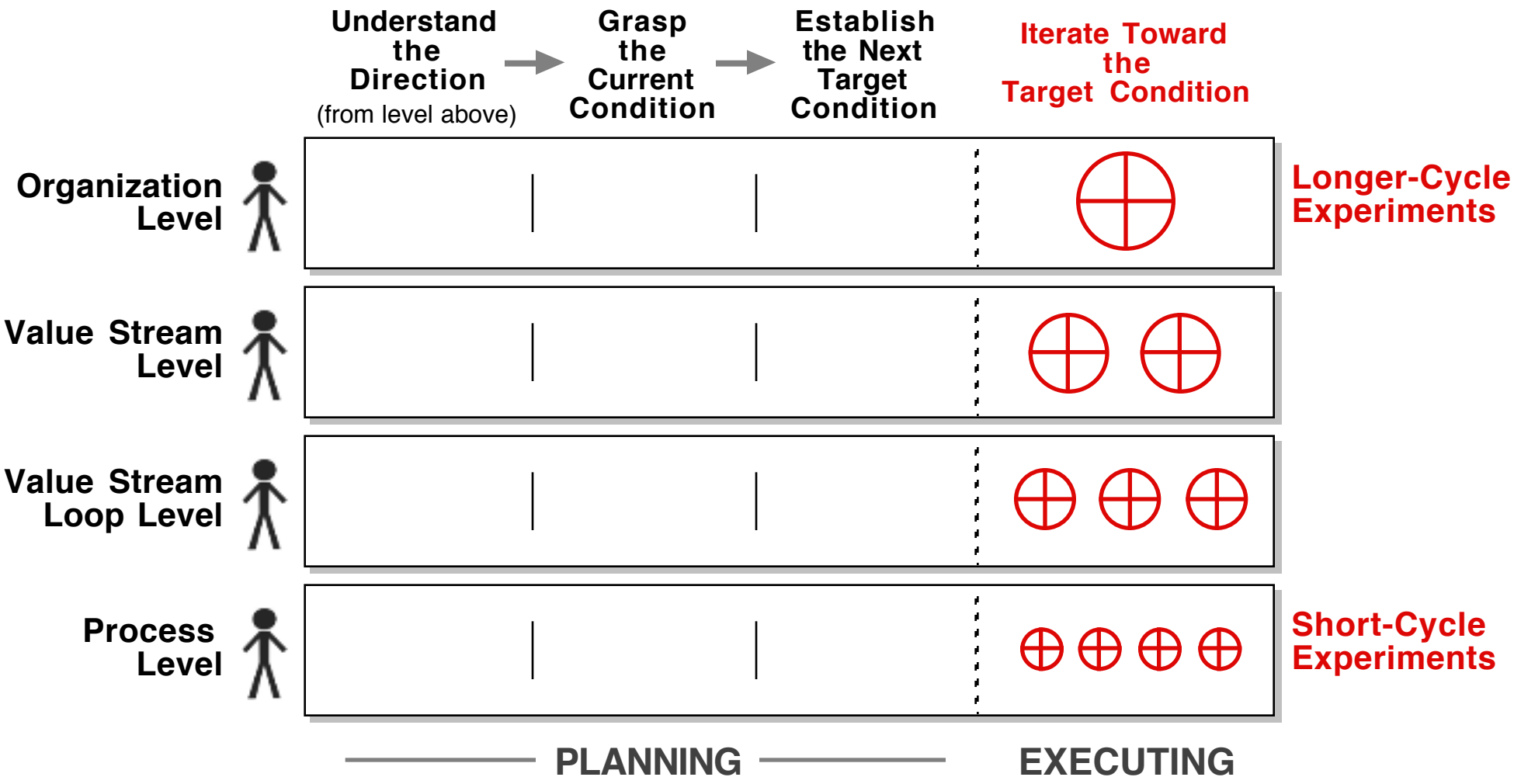
If prediction *error* is how we learn, then ideally we want those errors to happen as soon as possible. Some of the most useful learning comes from short, cheap and frequent PDCA cycles (daily experiments). The Improvement Kata pattern is about testing and learning in as rapid and frequent cycles as possible.

Long PDCA cycles don't produce enough timely learning to activate team ingenuity



AS RAPID & FREQUENT AS POSSIBLE

The faster you are able to learn, the more successful you'll be in reaching the target condition. But how rapidly you can experiment may vary depending on the level in the organization



WHY RAPID & FREQUENT CYCLES?

PDCA is used at all levels of an organization. However, the learning that is most useful for improvement, adaptation and innovation often comes from experiments at the process level. Why?

--> At the process level you pick up useful detail. Checks at a higher, macro level alone may lead only to conjecture about why something happened -- rather than useful, detailed facts and data for adaptation -- because at this level there are often too many variables in play to discern cause & effect.

--> At the process level there is often enough time to adjust and still reach the target condition in time. Checks at higher levels of granularity may come too late to do much about it.

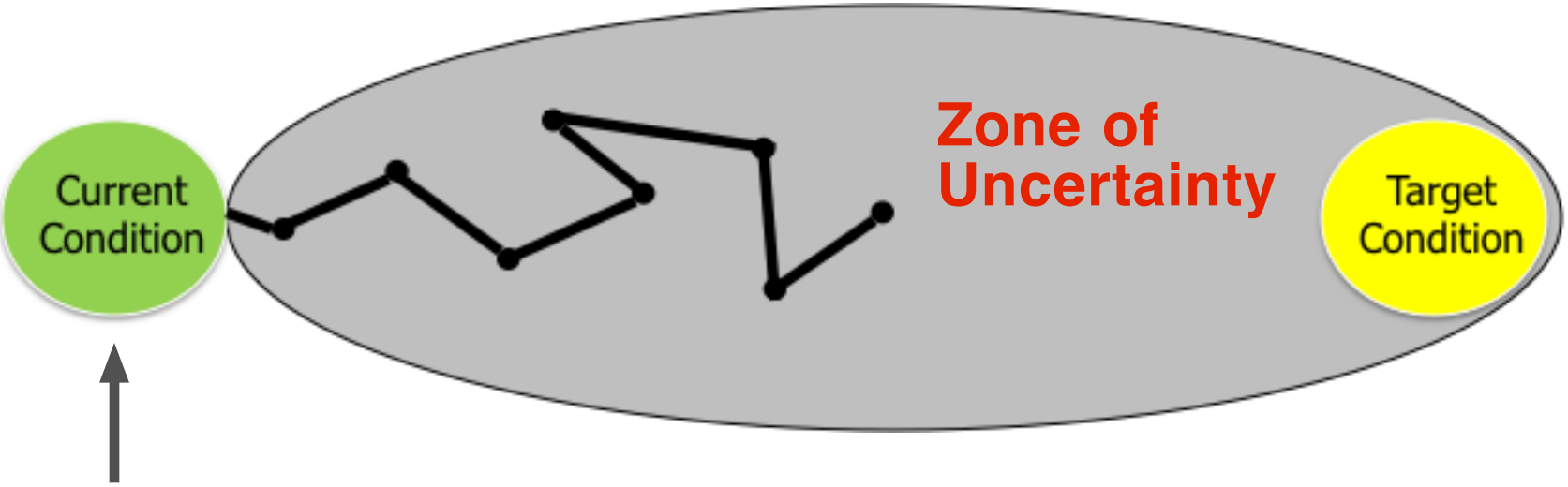
--> Small, process-level PDCA cycles are experiments that can be done on a scale where failures (learning) are inexpensive and don't harm the customer.

Learning at higher levels often comes from agglomerating (bundling) the findings of experiments at the process level.

In Summary:

STRIVE TOWARD THE TARGET CONDITION THROUGH ITERATIVE LEARNING

Small, rapid experiments advance your knowledge quickly



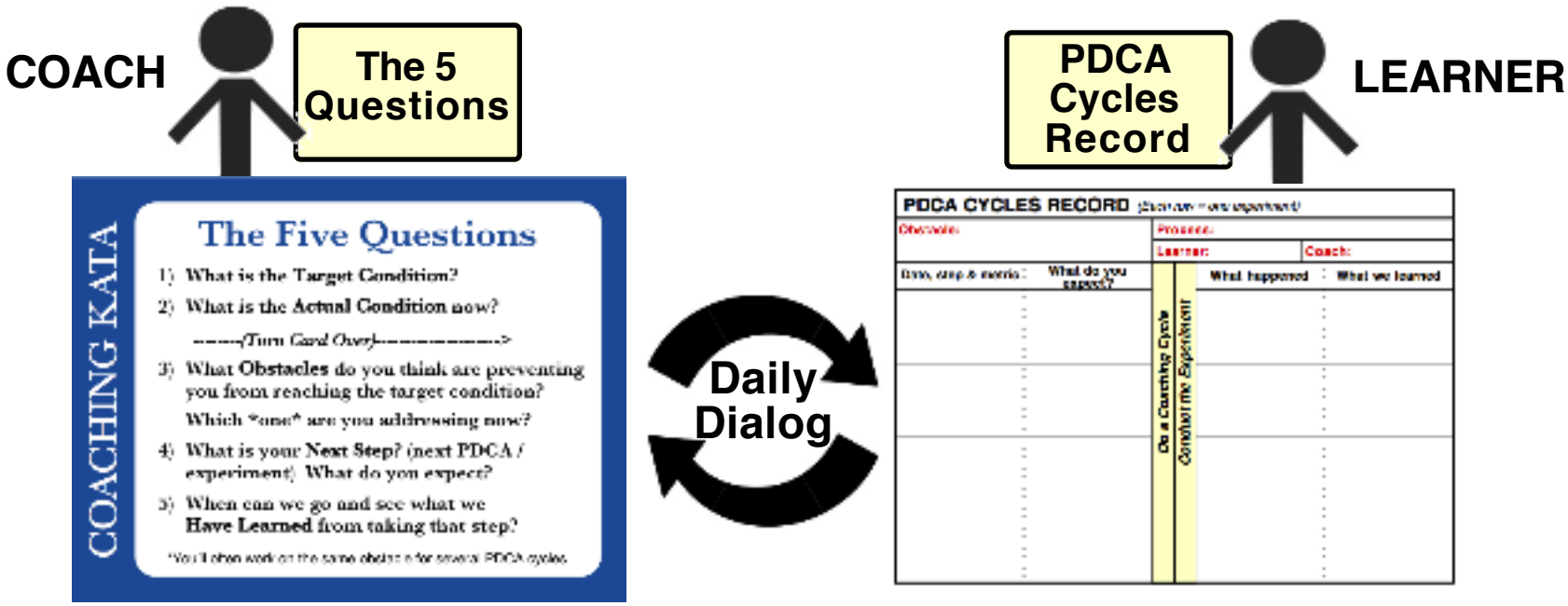
YOU DON'T KNOW HOW TO GET FROM HERE TO THERE!

Experimenting the right way

Practice Routines

TWO POWERFUL ROUTINES FOR ACHIEVING ANY TARGET CONDITION

The Five Coaching Kata Questions (Coach) and the PDCA Cycles Record (Learner) are used <u>together</u>, in daily Coaching Cycles at the Learner's storyboard. Use these two routines to teach and foster systematic and effective experimentation. Follow these Kata exactly until you can internalize their patterns.



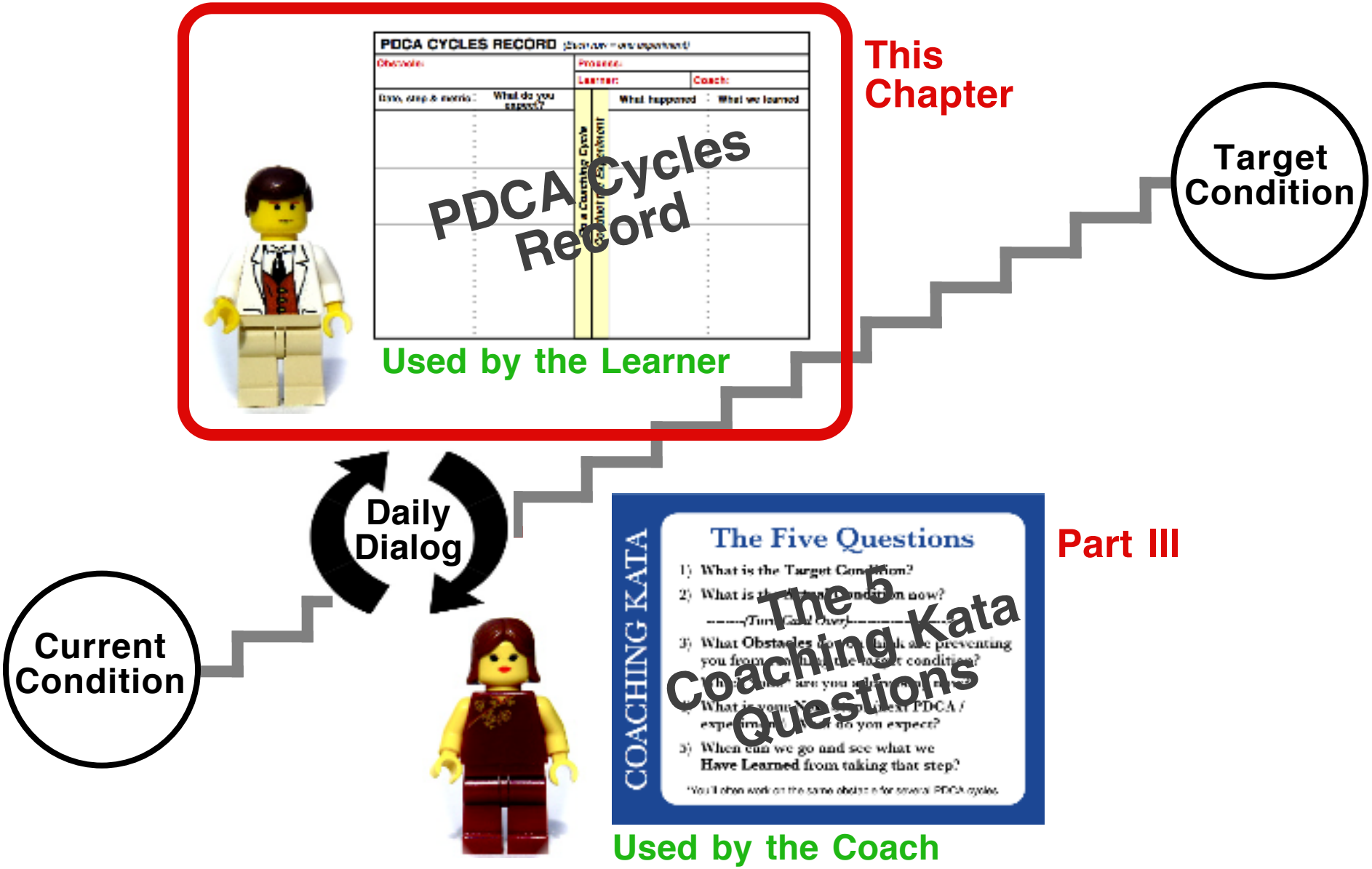
The Coach asks the Five Coaching Kata Questions before each experiment the Learner conducts. How to use them is described in the <u>Part III</u>.

The PDCA Cycles Record is the Learner's main tool for planning the next experiment and reflecting on the last experiment. How to use it is described in <u>this chapter</u>.

These forms are available in the Appendix & on the Toyota Kata Website

THE LEARNER'S PDCA ROUTINE STEP-BY-STEP

The following pages explain how the Learner should practice experimenting with the PDCA Cycles Record

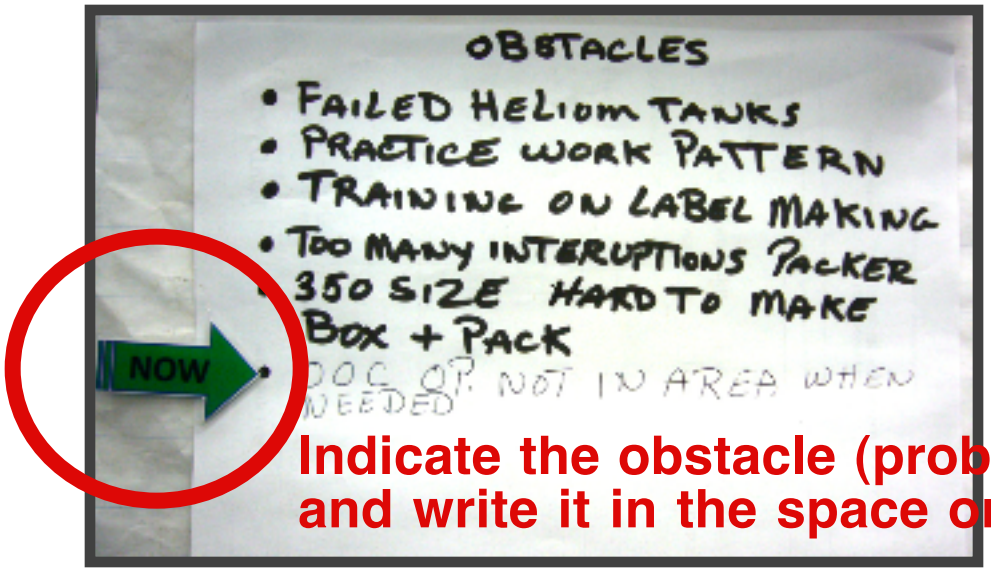


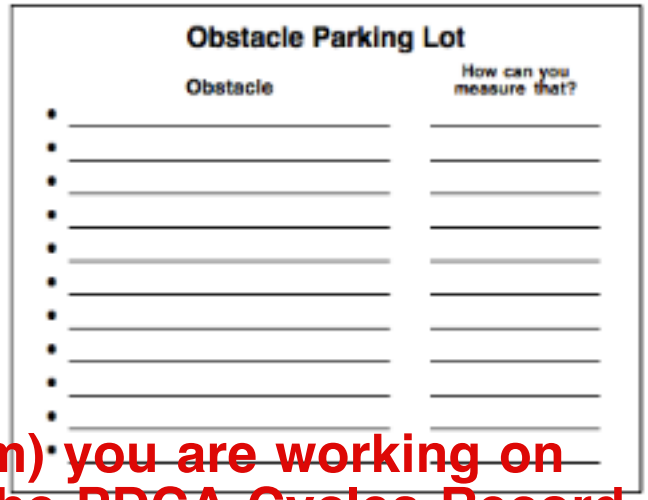
FIRST, PICK ONE OBSTACLE AND WRITE IT ON THE PDCA CYCLES RECORD

Do your experiments against <u>one</u> obstacle. Put an arrow on the Obstacles Parking Lot to indicate visually what obstacle is currently being experimented against, and write this obstacle in the space provided on the PDCA Cycles Record.

You are free to select whatever obstacle you want. You don't need to start with the biggest obstacle. In fact, for Improvement Kata beginners it's better to not tackle the biggest obstacle right away so the Learner can first develop some skill and self-efficacy.

It doesn't matter where you start because once you get going you're locked into the chain of PDCA cycles, where what you learn in one step leads to the next step. The obstacles that you will need to work on will wait patiently until you encounter them. If you pick a wrong obstacle that will soon make itself known through your experiments.

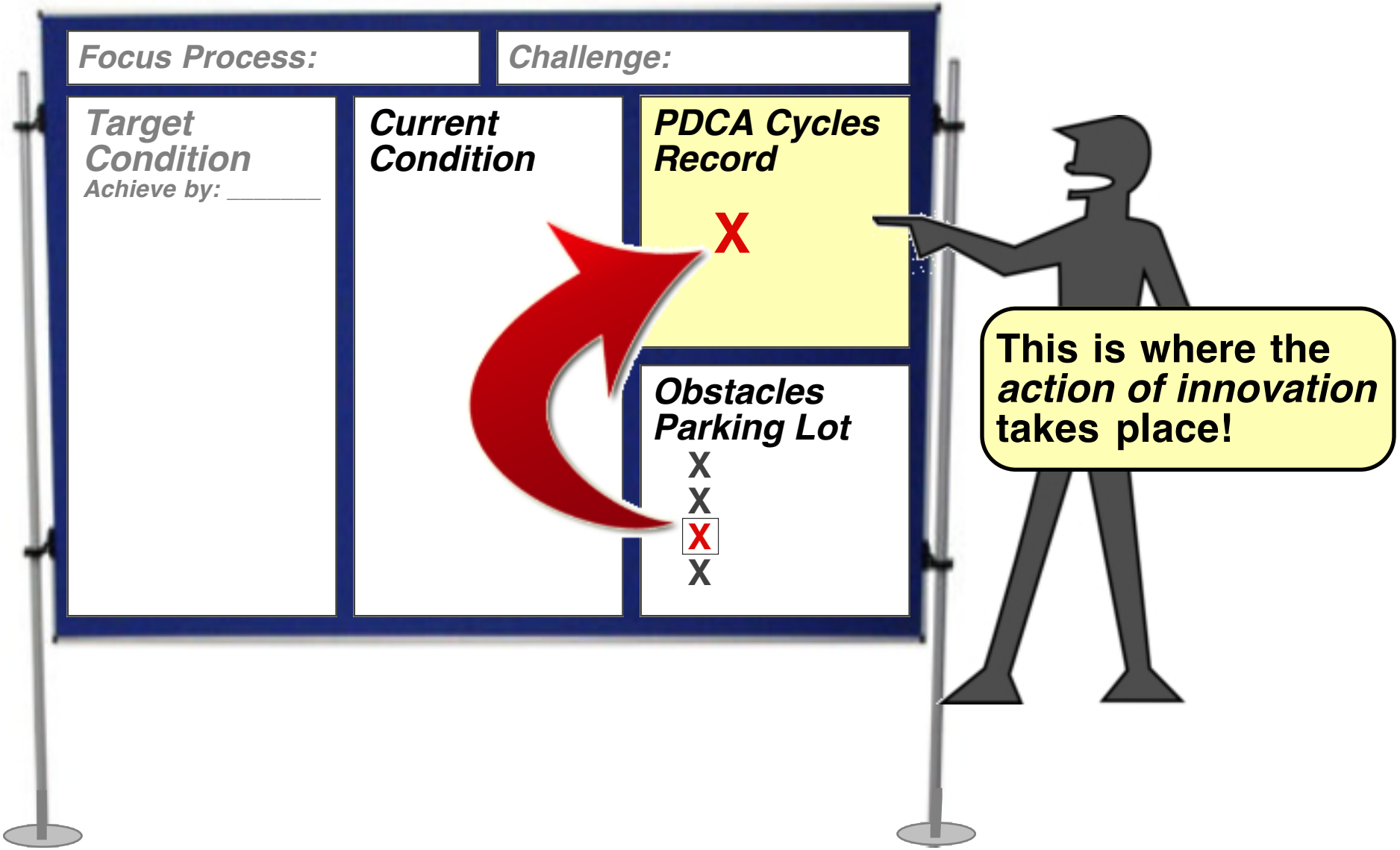




Indicate the obstacle (problem) you are working on and write it in the space on the PDCA Cycles Record

YOU'RE MOVING ONE OBSTACLE AT A TIME UP THE STORYBOARD

What problem are we working on now?



THE LEARNER'S PDCA CYCLES RECORD

PDCA CYCLES RECORD *(Each row = one experiment)*

Obstacle:

Process:

Learner: **Coach:**

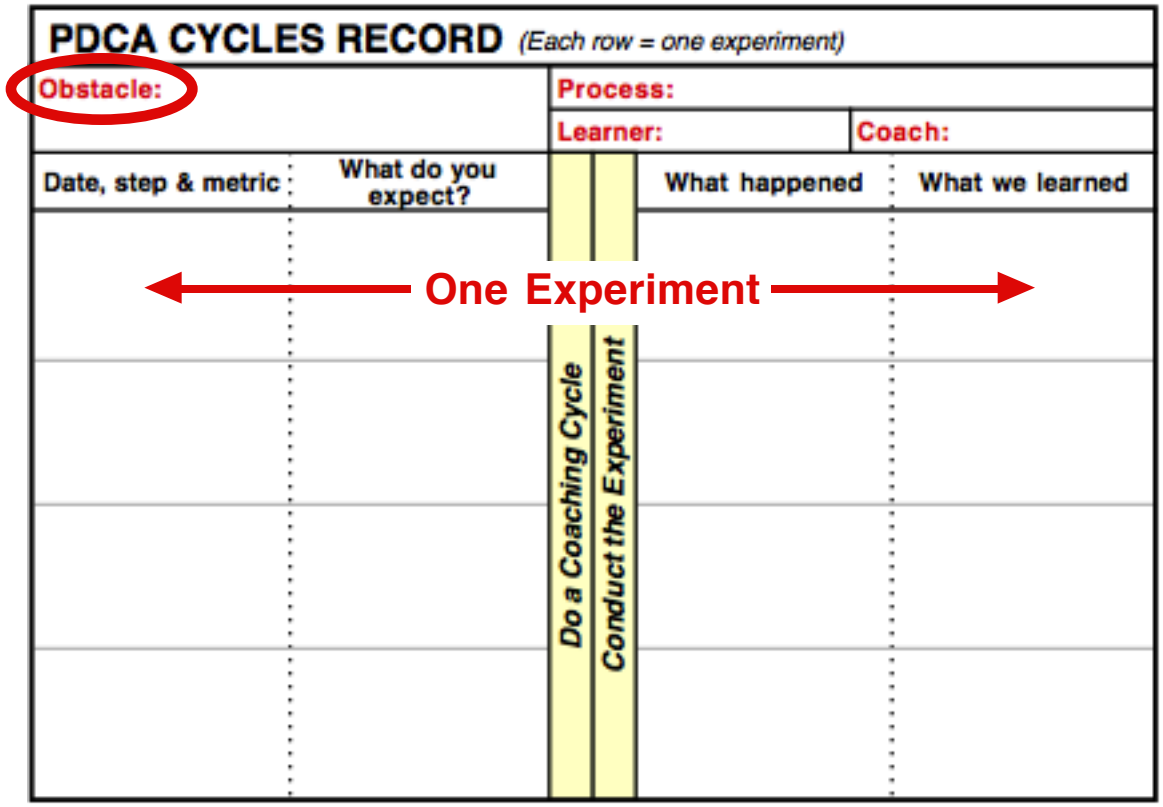
Date, step & metric	What do you expect?	*Do a Coaching Cycle*	*Conduct the Experiment*	What happened	What we learned

LAYOUT OF THE PDCA CYCLES RECORD

The PDCA Cycles Record is the Learner's main tool for communicating (a) the plan for the next experiment and (b) the reflection from the last experiment

- **Each PDCA Cycles Record form is dedicated to one obstacle. It usually takes a series of experiments to overcome an obstacle. When the Learner starts working on a new obstacle, s/he should start a new PDCA Cycles Record.**
- **Each row represents one experiment against the current obstacle.**
- **The form has a 'Prediction Side' and an 'Evidence Side'**

This is the obstacle to the Target Condition, that the Learner is currently working on



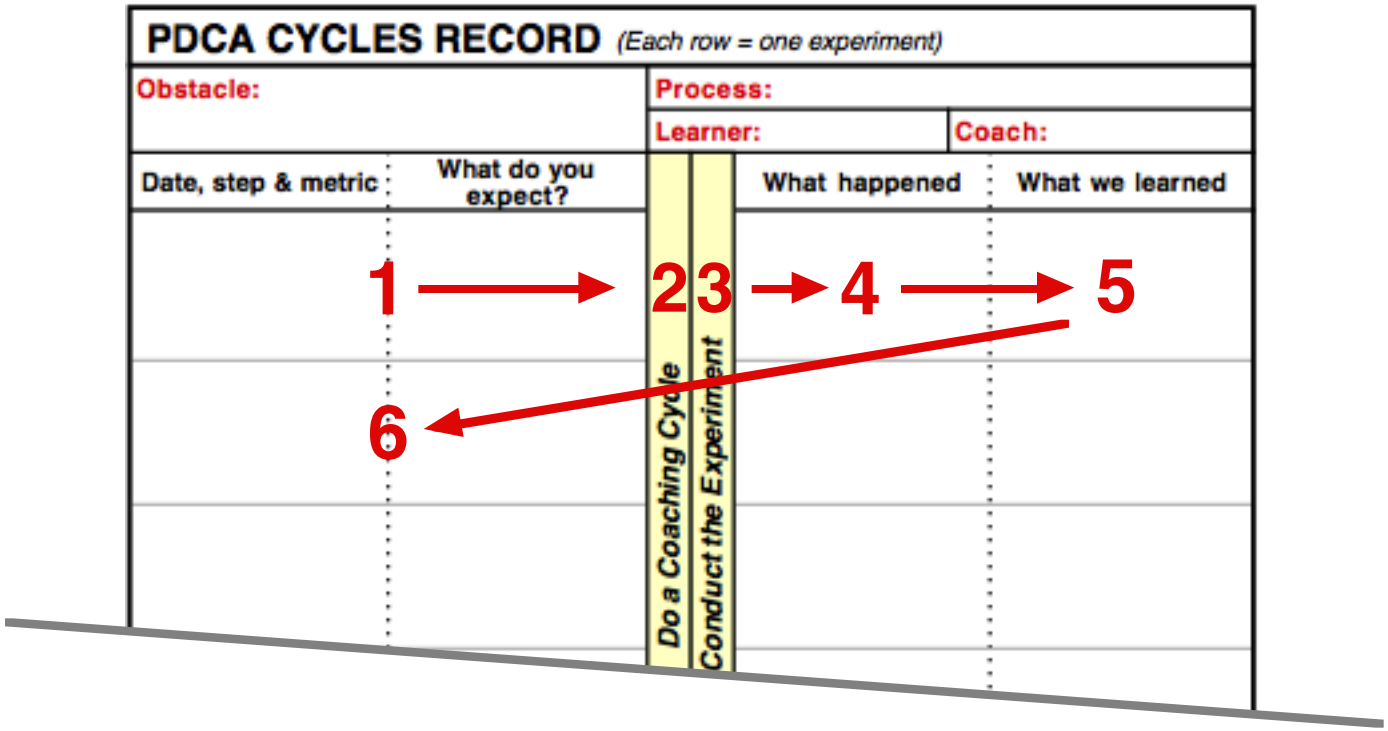
Prediction Side
Written before the experiment

Evidence Side
Written after the experiment

The information on the PDCA Cycles Record is written by the Learner *before* the next coaching cycle.

During the coaching cycle the Coach will either accept the proposed next step (next experiment), or give feedback to help improve the design of the next experiment.

THE STEPS FOR USING THE PDCA CYCLES RECORD



1. Plan the experiment, indicating the date, the proposed step, how it will be measured and the predicted result.
2. Go through a Coaching Cycle. The Coach gives feedback on the design of the next experiment as necessary. Make adjustments based on the Coach's input.
3. Conduct the experiment.
4. Record the facts and data about what actually happened.
5. Reflect on the outcome of the experiment by comparing the predicted result with the data, and summarize what was learned.
6. Propose the next experiment (date, step, metric & predicted result) based on what was learned.

STEPS FOR USING THE PDCA CYCLES RECORD

The PDCA Cycles Record is read left-to-right, one row at a time. Each row = one experiment. Once you get started, the pattern of the form repeats after each experiment.

① **PREDICTION SIDE:**
Before the first coaching cycle the Learner proposes the <u>1st step, what will be measured</u>, and what s/he <u>expects</u> in the first two boxes of the form

THRESHOLD OF KNOWLEDGE:

- **What do we need to learn now?**
- **How will we test it?**
- **How will we measure it?"**

PDCA CYCLES RECORD *(Each row = one experiment)*

Obstacle:		Process:			
		Learner:		Coach:	
Date, step & metric	What do you expect?	*Do a Coaching Cycle*	*Conduct the Experiment*	What happened	What we learned
X	X				

Now the Leaner and Coach do a coaching cycle

Then the Learner conducts the experiment

STEPS FOR USING THE PDCA CYCLES RECORD

① **PREDICTION SIDE:**
Before the first coaching cycle the Learner proposes the 1st step, what will be measured, and what s/he expects in the first two boxes

PDCA CYCLES RECORD *(Each row = one experiment)*

Obstacle:		Process:			
		Learner:		Coach:	
Date, step & metric	What do you expect?	Do a Coaching Cycle	Conduct the Experiment	What happened	What we learned
				X	X

② **EVIDENCE SIDE:**
Once the step (experiment) is done, the Learner fills in data on What Happened, reflects by comparing that with the expectation, and records What We Learned

Reflect on the data, observations and even how you took the step. What went differently than you expected?

In checking the results of an experiment try to measure and observe several cycles of the process.

STEPS FOR USING THE PDCA CYCLES RECORD

① **PREDICTION SIDE:**
Before the first coaching cycle the Learner proposes the 1st step, what will be measured, and what s/he expects in the first two boxes

PDCA CYCLES RECORD *(Each row = one experiment)*

Obstacle:		Process:			
		Learner:		Coach:	
Date, step & metric	What do you expect?	Do a Coaching Cycle	Conduct the Experiment	What happened	What we learned

Next Experiment
X X

② **EVIDENCE SIDE:**
Once the step (experiment) is done, the Learner fills in data on What Happened, reflects by comparing that with the expectation, and records What We Learned

③ **PREDICTION SIDE:**
Based on what was learned in the last experiment, the Learner proposes the next step, what will be measured and what s/he expects

Now it's time for the next coaching cycle
(and making adjustments based on the Coach's input)

THE SCIENTIFIC LEARNING CYCLE IS EMBEDDED IN THE PDCA CYCLES RECORD

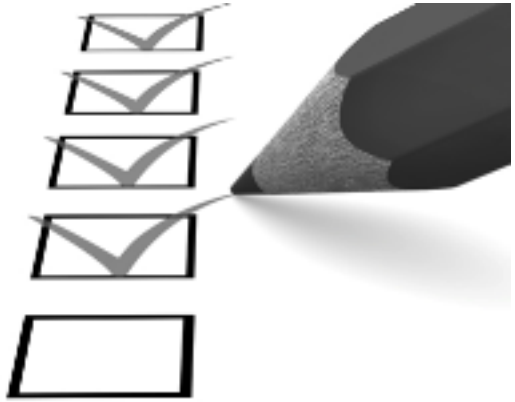
To make the cycle easy to operationalize & practice

ACTION

PDCA CYCLES RECORD *(Each row = one experiment)*

Obstacle:		Process:		
		Learner:		Coach:
Date, step & metric	What do you expect?	*Do a Coaching Cycle* / *Conduct the Experiment*	What happened	What we learned
PREDICTION			**EVIDENCE**	**EVALUATE**

EXPERIMENTING GUIDELINES FOR THE LEARNER



INCLUDES CHECKLISTS FOR PLANNING & EVALUATING YOUR EXPERIMENTS

CHECKLIST FOR PLANNING AN EXPERIMENT

- ❑ **Conduct experiments against an obstacle to the Target Condition, not randomly.**
- ❑ **What do you need to learn now? Identify your current Threshold of Knowledge and conduct the next experiment there.**

  What is the current TOK? _____
- ❑ **How will you test your idea? Can you do a single-factor experiment, where only one thing is changed? (Not always possible)**
- ❑ **How can you test your prediction as soon and quickly as possible? Simple & soon is better. How about now? (*Hold* before *tape* before *weld*)**
- ❑ **Make sure that failure won't harm anyone or anything. If necessary build up a buffer before conducting the experiment or conduct the experiment offline in a simulation.**
- ❑ **Write onto the PDCA Cycles Record what you expect to happen (your prediction) *before* you do the experiment.**
- ❑ **How will you measure it? The experiment must be measureable in some way, so you can determine if the prediction was confirmed or refuted.**
- ❑ **If possible the experiment should build on what was learned in your previous experiment.**
- ❑ **In order to learn from your experiment you must be open to and willing to see that the result may not conform to your expectation. Own it!**

CALIBRATE YOUR TEAM BEFORE EXPERIMENTING

--- Ask your team: "*Why do we experiment?*" ---

It's not: *Let's see if this idea works*

But rather:

Let's see what <u>doesn't</u> work, so we can see what we need to do to make it work

This is what many of us mistakenly think *experimenting* is about

GOOD THINGS TO SAY:

"We already know it won't work at first. We're interested in seeing what doesn't go as planned, so we can learn what we need to work on."

"Don't be discouraged when an experiment fails. That's how we learn!"

EXPERIMENT AT THE *KNOWLEDGE THRESHOLD*

Create new learning where the facts run out

This is where you should do your next PDCA experiment

Predictable Zone

Uncertainty / Learning Zone

Experimenting

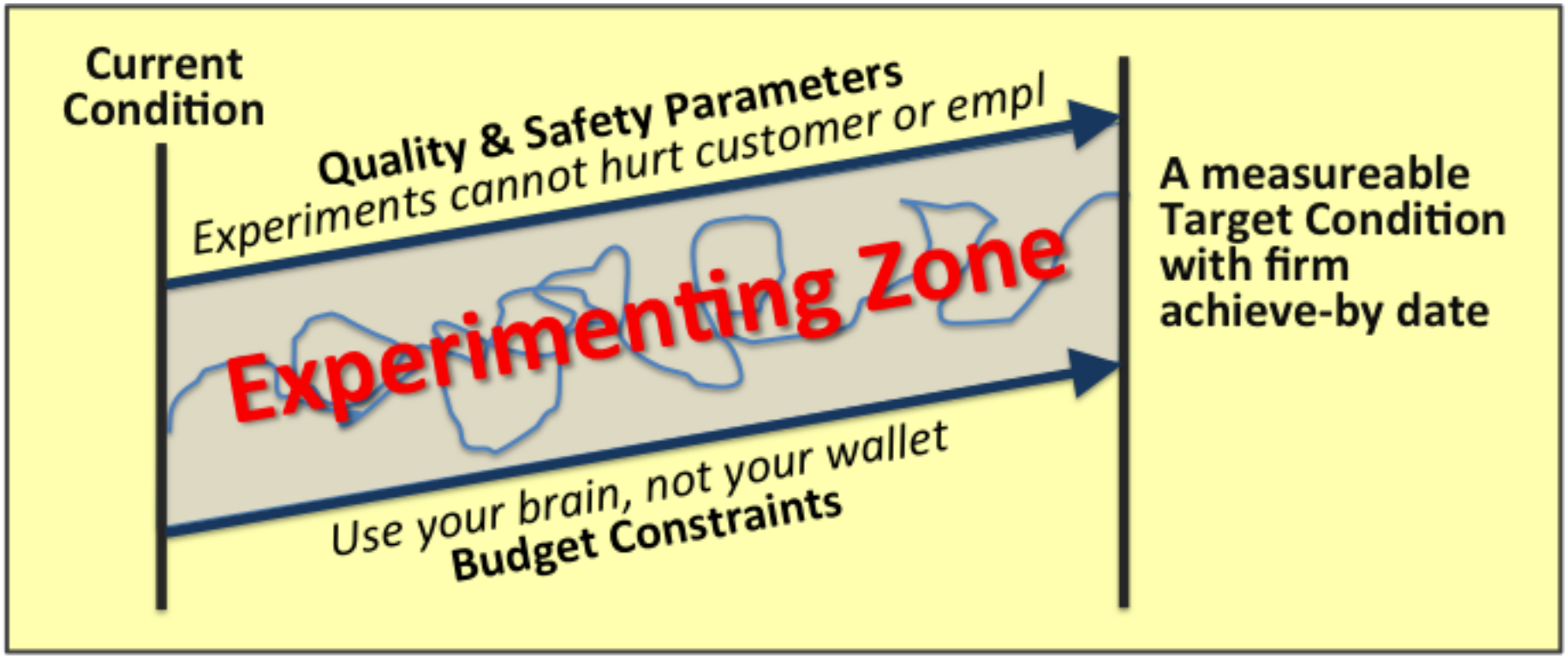
Next Target Condition

Current Knowledge Threshold

Spot the knowledge threshold, acknowledge it, and conduct your next PDCA experiment here as quickly as possible!

DO YOUR TESTS INSIDE THE *EXPERIMENTING ZONE*

The Target Condition is measureable and has a firm achieve-by date. There are budget constraints and quality & safety parameters.



It's *within* these boundary conditions that you design and conduct frequent, rapid, cheap, non-harmful, successive experiments toward the target condition. Experiments are done as cheaply and quickly as possible. For example, think *hold* before *tape* before *weld*.

It's important that there is no penalty for failures inside the Zone. Failed experiments here are often how we learn & progress.

NOTE THAT THE STEPS YOU ACTUALLY TAKE WON'T COME FROM AN ACTION-ITEM LIST

A chain of PDCA cycles

VERSUS

A preconceived action-item list

Most of the day-to-day steps you take toward the target condition won't come from a pre-determined action plan, Pareto analysis or brainstorming. They come from the chain of rapid and frequent PDCA cycles, where what you learn in one step often leads you to your next step.

Do not stab at an obstacle with disconnected countermeasures in the hope that something will work. Instead, this is how you iteratively work toward and find your way to the target condition by the achieve-by date:

(1) Only work on those obstacles that you sequentially find are actually preventing you from reaching the target condition.

(2) Try to work on one obstacle at a time. Plan your steps and reflect on them with the PDCA Cycles Record.

(3) From each experiment related to the current obstacle you'll gain new information. Use this information to adjust and define your next step toward breaking through the obstacle. Then choose the next obstacle.

(4) Keep in mind that the target condition's achieve-by date is firm. Do your experiments as fast and frequently as possible.

THE NEED TO TEST

Use whatever information and knowledge you can in order to design your experiments toward the target condition. This includes existing information such as research results.

However, keep in mind that even if you reference existing information, what will end up working for your specific case and target condition is still a grey area where you need to iterate. The information you use, regardless of its source, needs to be tested and verified within the context of your current and target conditions.

IF POSSIBLE
DO SINGLE-FACTOR EXPERIMENTS

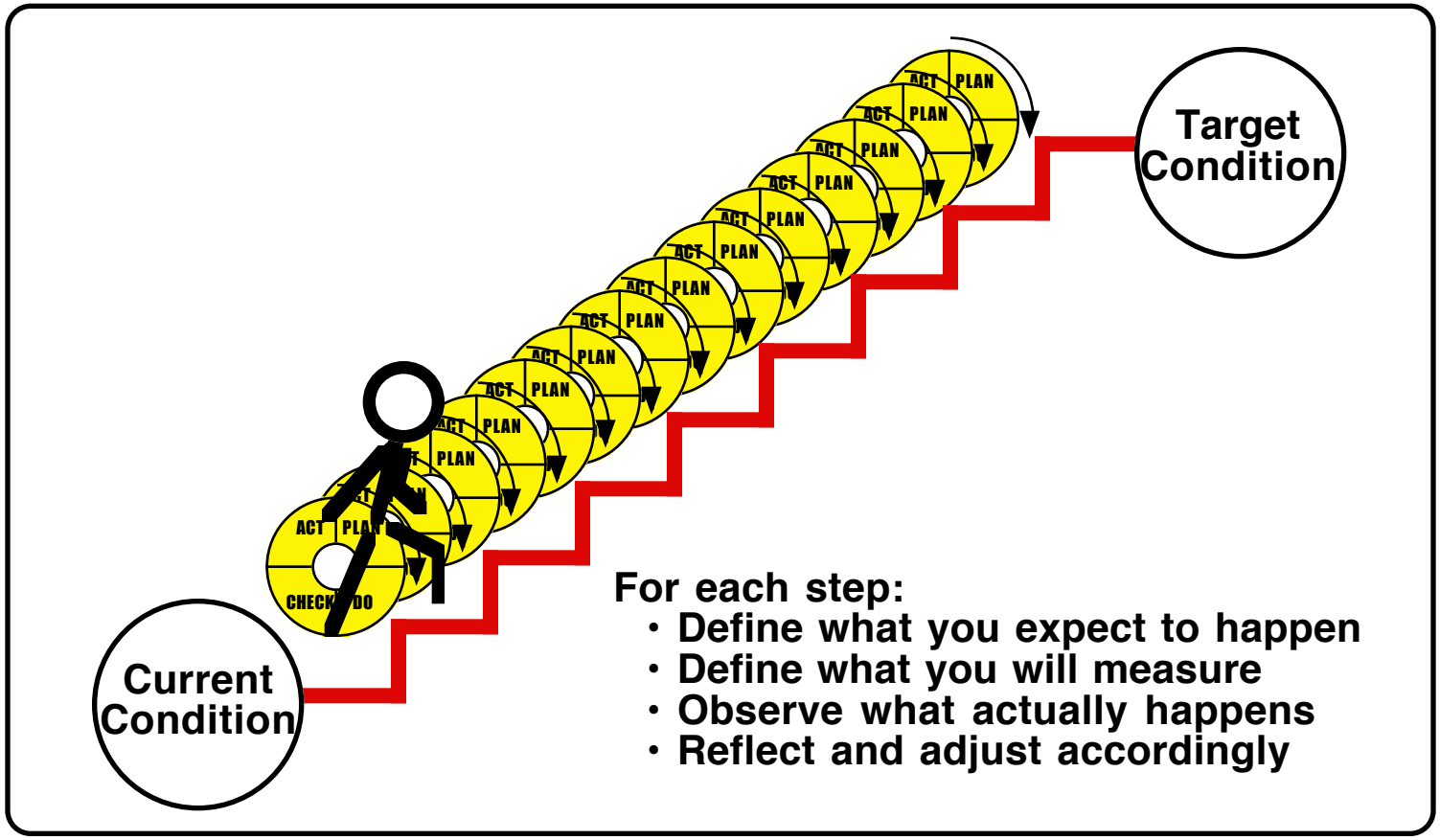
Also called "Controlled Comparison"

Try to change only one thing at a time and then check the result against the expected result. Such "single-factor experiments" are preferred because they allow you to see and understand cause and effect, which helps you develop a deeper understanding of the process you're trying to improve. The goal is to learn about the focus process, not just to shut off a problem via a shotgun blast of countermeasures.

Of course, serial rather than parallel countermeasures would be too slow if each PDCA cycle takes a long time. This is another reason why individual PDCA cycles should be turned as quickly as possible.

Single-factor experiments are not the only kind of experiment and not always possible. The table on the next page describes three common types of PDCA experiments.

EACH STEP YOU TAKE = A PDCA CYCLE



A PDCA cycle may take only minutes. Suppose we decide, in pursuit of a target condition, to move some work elements from one operator to another.

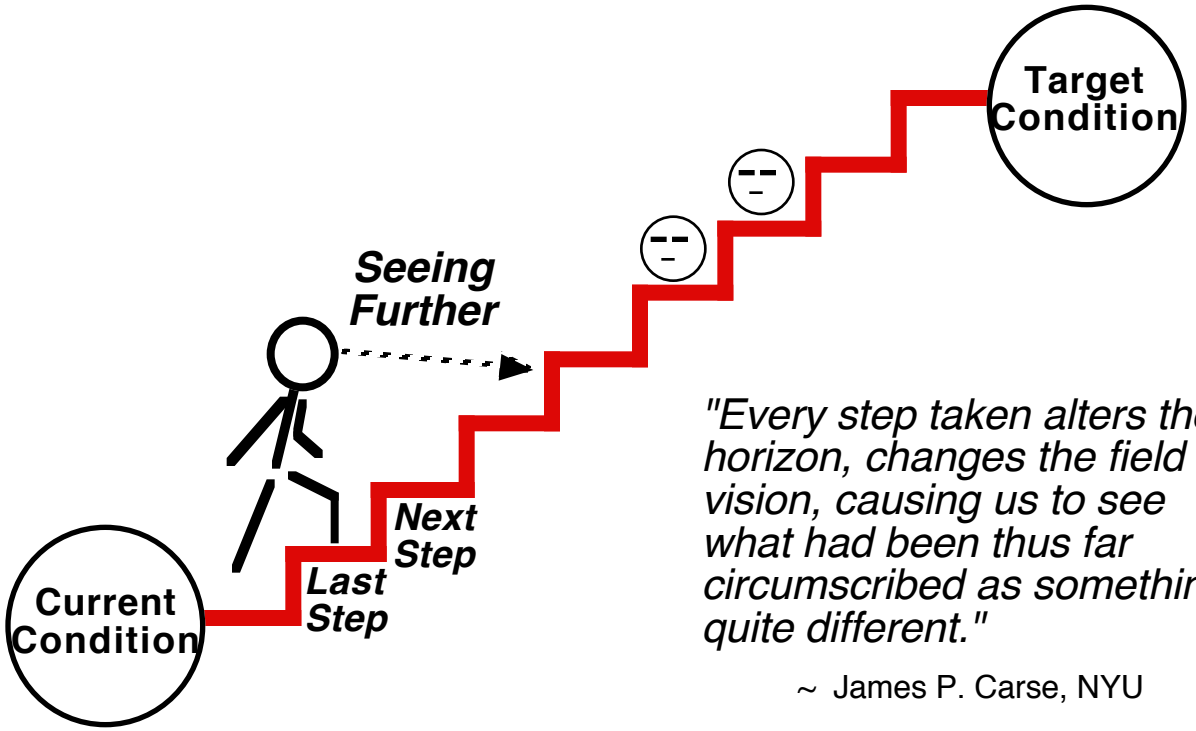
We take that step, observe that the outcome is not what we expected, but then recognize something else that could generate the desired effect. That was a PDCA cycle.

When you experiment...
YOU DON'T HAVE TO THINK TOO FAR AHEAD

You don't actually know what the result of the next step will be

Once you have a target condition, concentrate on the next step. What you learn from that will probably influence your next step after that, so be in the moment and apply PDCA.

You'll only see the full path to the target condition in *hindsight*. You're probably not going to be taking the most direct route there.

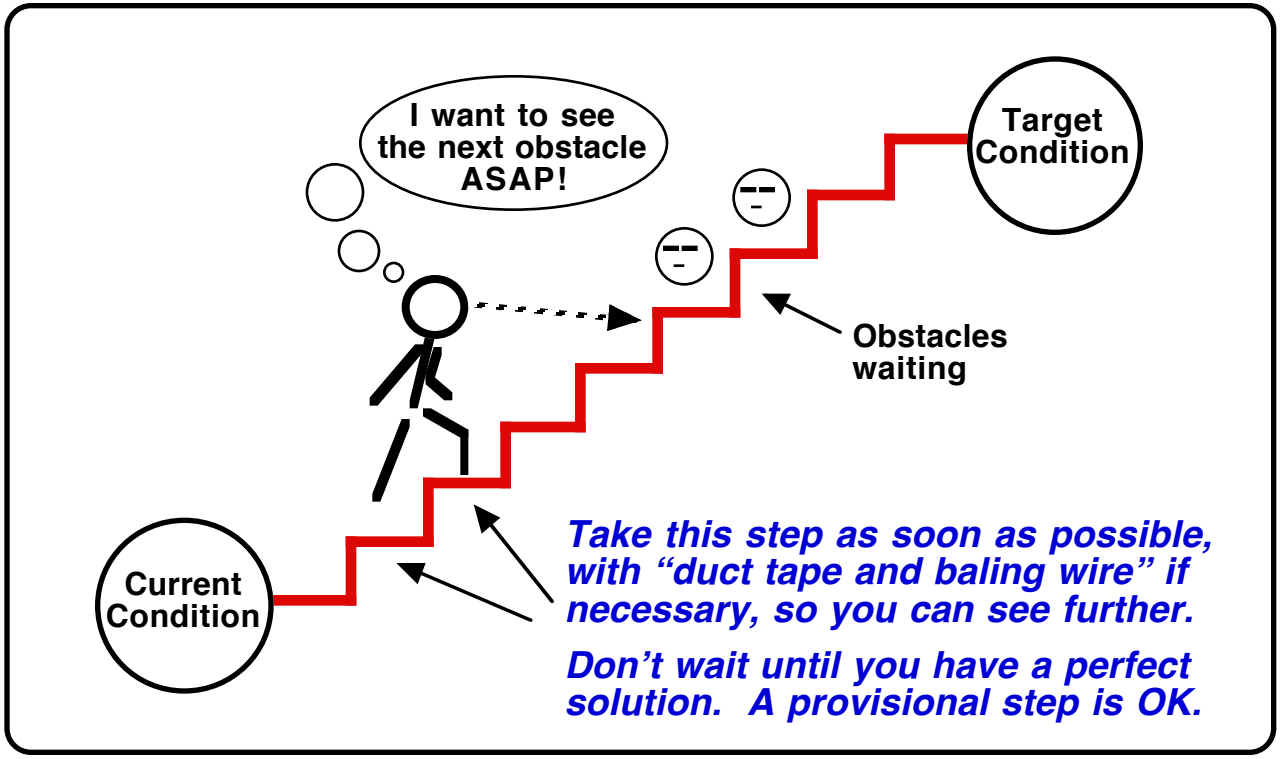


"Every step taken alters the horizon, changes the field of vision, causing us to see what had been thus far circumscribed as something quite different."

~ James P. Carse, NYU

TRY TO DO THE EXPERIMENT RIGHT NOW, WITH WHATEVER YOU HAVE

Conduct your experiment as quickly and cheaply as possible by asking, *can we do it right now?*



The results of experiments are what help you see beyond the current knowledge threshold, uncover true obstacles and find the way forward. You'll see the next step and maybe the next obstacle after taking a step, so take that step ASAP.

EXAMPLE OF 3 KINDS OF PDCA EXPERIMENTS

An *experiment* is a learning experience that doesn't necessarily involve making a change in the focus process. "Further analysis" or "go and see" can be an experiment, as long as a prediction of "what the Learner expects" is made on the PDCA Cycles Record. The following hierarchy goes from less to more scientific. All are acceptable.

1) Go and See

Direct observation and data collection, without changing anything, to learn more about a process or situation.

2) Exploratory Experiment

Introducing a change in a process to see, via direct observation, how the process reacts. Done to help better understand the process.

Example: Try to run a process as specified in the target condition in order to see what happens. This is often an early experiment.

3) Testing a Hypothesis

Introducing a change, ideally in only a single factor, together with a prediction of what you expect to happen.

WHAT SHOULD YOUR FIRST STEP BE?

The first experiment is often an exploratory experiment

One elegant tactic for a first step is to try to run the process as described in the target condition. We already know it won't work, but you are at a knowledge threshold right now. That is, you may only have conjecture about what first step to take. An exploratory experiment like this gets *true* obstacles to reveal themselves, so you know *scientifically* what you *need* to work on.

First PDCA cycle → → → → **Second PDCA cycle**

Try running the process as specified in the target condition	See a bunch of <u>true</u> obstacles	Note them on the obstacles parking lot	Pick one obstacle	Start your single-factor PDCA cycles

CHECKLIST FOR EVALUATING THE RESULTS OF AN EXPERIMENT

- To check the results of an experiment you may need to observe and measure several cycles.

- Evaluation has two phases:

  1) Compiling the facts and data from the experiment ("Check")

  2) Forming conclusions based on the facts and data. ("Act")

  Maintain a clear distinction between recording the facts / data, and interpreting the results.

- There are several possible outcomes, for instance:
  --> The results support your prediction and you can standardize the step.
  --> The results do not support your prediction. (Interesting!)
  --> The results came close and you can see what you have to try next.
  --> You can't tell and need more information.

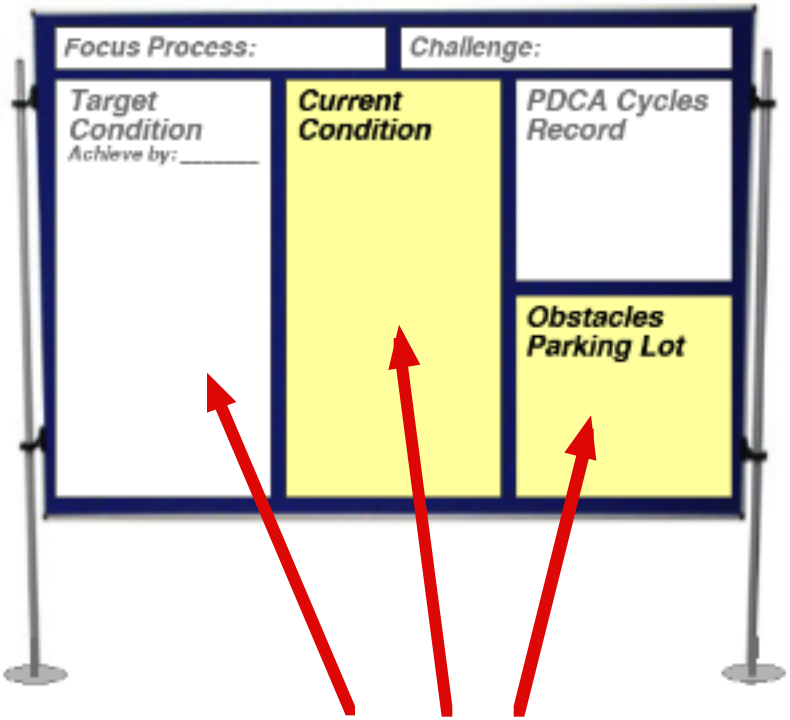
- It is not unusual for more than 50% of the experiments to fail. The benefit you get is learning from them what you *need* to focus on and do to overcome the obstacle on the way to your Target Condition.

- When an experiment is successful you may need to think about how to standardize the change you made.

- It's a good idea to reflect on what could you have done differently to improve your experimental procedure.

UPDATE THE STORYBOARD!

The current condition may be new after each experiment



Any time you make a change in a process, it's now a new process that has a new current condition.

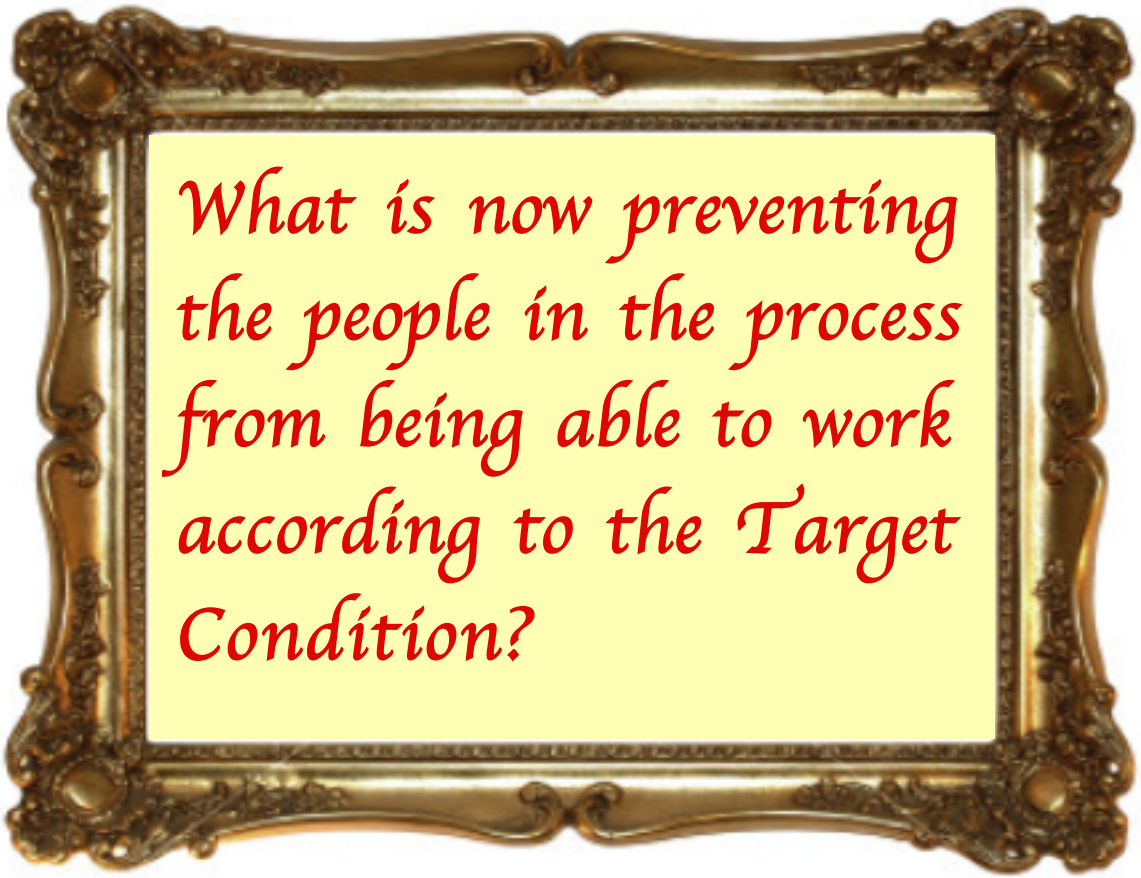
- **Update the facts and data in the "Current Condition" field of your storyboard before the next coaching cycle.**
- **Also update the "Obstacles Parking Lot," if new obstacles were discovered or listed obstacles are no longer an issue.**
- **You can also add detail to the "Target Condition" as you learn.**

COACHING CYCLE: Answering the Coach's Questions

0	**What is the challenge?**	Explain what you understand the overarching challenge to be, which comes from the level above you.
1	**What is the target condition?**	Read through the description of the target condition that's posted on your storyboard. Point to the items as you read. The TC should be measureable and have an achieve-by date.
2	**What is the actual condition now?**	Read through the facts, data and diagrams of the current condition as it is now (not the initial current condition) that's posted on your storyboard. Point as you read.
REFLECTION	**What was your last step?**	Read the first box on your PDCA Cycles Record.
	What did you expect?	Read the second box on your PDCA Cycles Record.
	What actually happened?	Read the third box on your PDCA Cycles Record.
	What did you learn?	Read the fourth box on your PDCA Cycles Record.
3	**What obstacles do you think are preventing you from reaching the target condition?** **Which *one* are you addressing now?**	Read through the items on your Obstacles Parking Lot. Stick an arrow pointing at the obstacle you are currently working on, and point to this obstacle.
4	**What is your next step? (next PDCA experiment) What do you expect?**	Read the first and second boxes in the next row of your PDCA cycles record. **Use the *"Checklist for Planning PDCA Cycles"* to help you plan and explain your next experiment.**
5	**When can we go and see what we have learned from taking that step?**	Date and time you propose for the next coaching cycle. The Coach will encourage you to do the experiment as soon as possible. Agree on the facts & data you'll bring to the next coaching cycle.

If possible *show* your Coach at the focus process what you're talking about

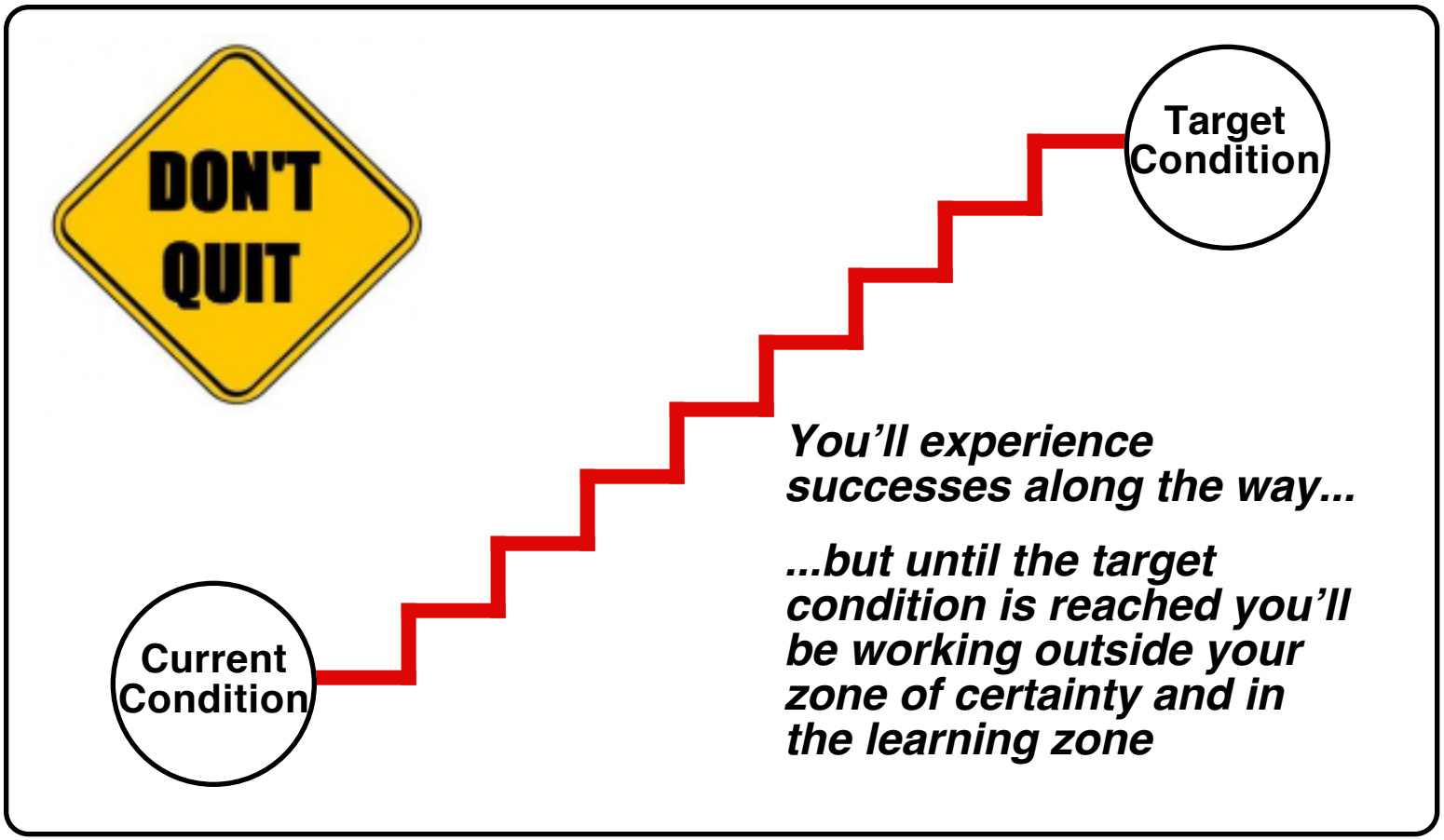
ASK YOURSELF THIS QUESTION AFTER EACH EXPERIMENT



This perspective will keep you focused on the work process and help you work together with the process team

GET USED TO BEING IN THE *LEARNING ZONE*

It's where improvement, adaptiveness and innovation happen



Don't give up on the target condition! **The failures and obstacles you encounter are not reasons to abandon the target condition. They are the things you have to figure out and work through.**


DON'T
GIVE UP
on your Target Condition!

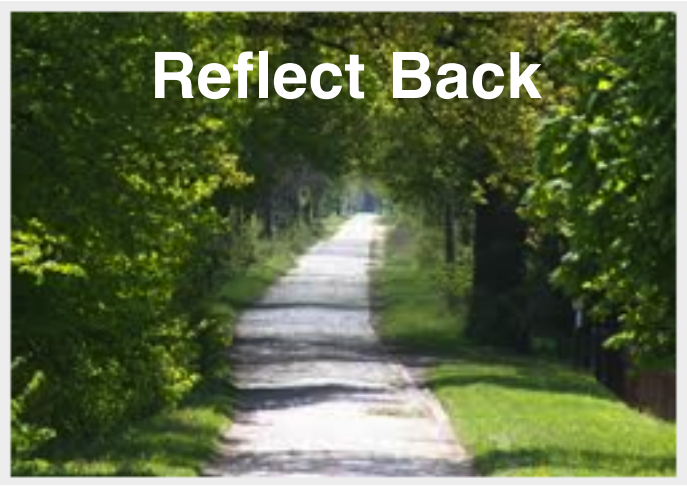
WHEN YOU REACH THE ACHIEVE-BY DATE

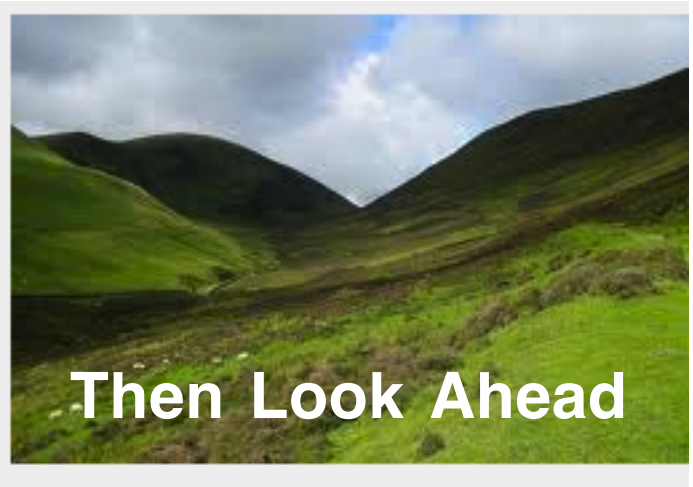
At some point you'll reach the target condition achieve-by date, often, but not always, having achieved your target condition. At this point you should pause and:

- **Do a summary reflection, i.e. a major reflection over the entire process. This can lead to lots of learning that may be applied in the next cycle through the Improvement Kata pattern.**

Then:

- **Revisit the overall direction or challenge**
- **Grasp the current condition as it stands now**
- **Establish the next target condition**





Remember, you'll most likely move through several target conditions in order to achieve the challenge

Special Cases:

WHAT ABOUT EXPERIMENTING WITH LONG-CYCLE PROCESSES?

The time it takes to conduct an experiment is often related to the cycle time of the focus process you're working on. The longer the process cycle, the longer the PDCA cycle, especially since you ideally need more than one data point. This can slow your learning, since you can't see further (beyond the knowledge threshold) without actually trying your next idea in some way.

Processes with very long cycles or that operate infrequently...

- **May not be available very often, making it difficult to observe the process.**
- **May mean that running an experiment can take days.**
- **Make it difficult to do single-factor experiments, because when the rare chance to test arises the Learner may naturally want to test several factors at once.**

EXPERIMENTING WITH LONG-CYCLE PROCESSES

When you're faced with a difficult process the question is not whether you *should* experiment, but *how*

How do you accelerate testing in infrequent processes with extended cycle time -- like some administrative and chemical processes -- to gain knowledge in a rapid, low cost way?

In these cases experiments often involve some type of parallel 'laboratory' simulation. The question becomes, *"How can we artificially test this step or idea more quickly?"* This approach involves conducting a series of rapid, low-cost simulation experiments (one per day for instance) in between less-frequent experiments on the actual process. You gain several learnings in the interval between actual process cycles, which culminate in one "big" experiment at the actual process under real conditions, to get information that can only come from the real process.

WHAT IF AN EXPERIMENT TAKES A LONG TIME TO PREPARE?

You can work in parallel when one step will take a long time to prepare. However, you should still try to change only one thing at a time in the focus process, to help you understand cause-and-effect.

Here's a way to work in parallel in this situation.

(X = a step/experiment)