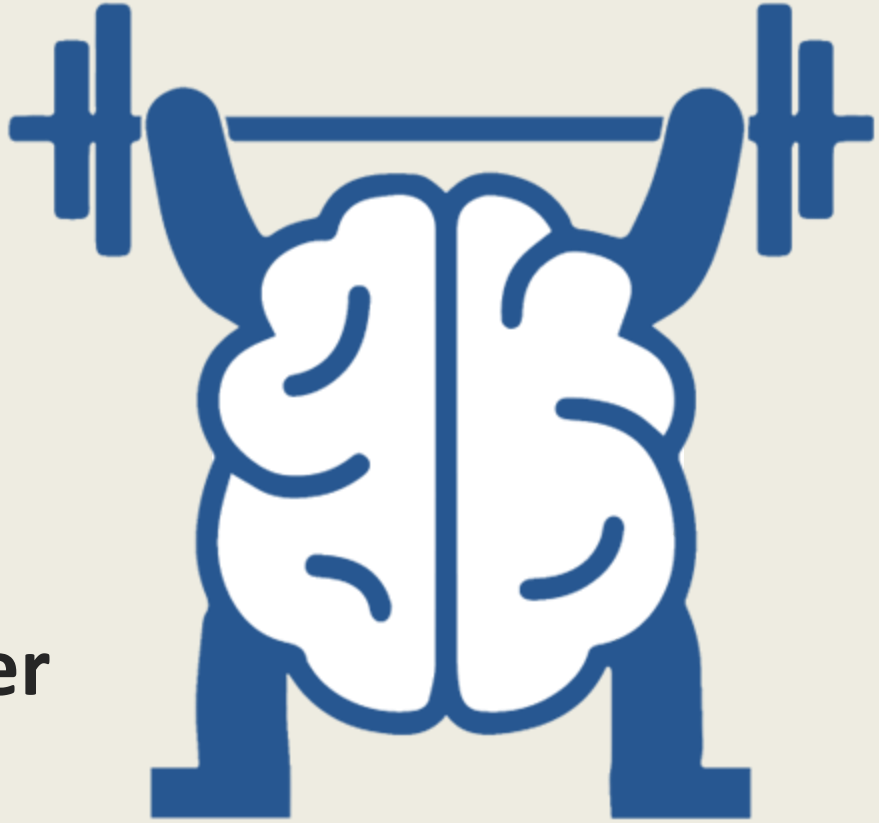
TOYOTA *KATA*

Daily Practice for
Scientific-Thinking Skill, Mindset & Culture



By
Mike Rother

COPYRIGHT INFORMATION

1 WHAT IS TOYOTA DOING?

We studied Toyota because of their enduring success as a company

The TK Research Questions (2004 – 2009)

1. ***What are the unseen managerial routines and thinking that lie behind Toyota's success with continuous improvement and adaptation?***
2. ***How can other companies develop similar routines and thinking in their organizations?***

SCIENTIFIC THINKING

As a Foundation for Improvment, Adaptiveness and Superior Results

Visible Stuff

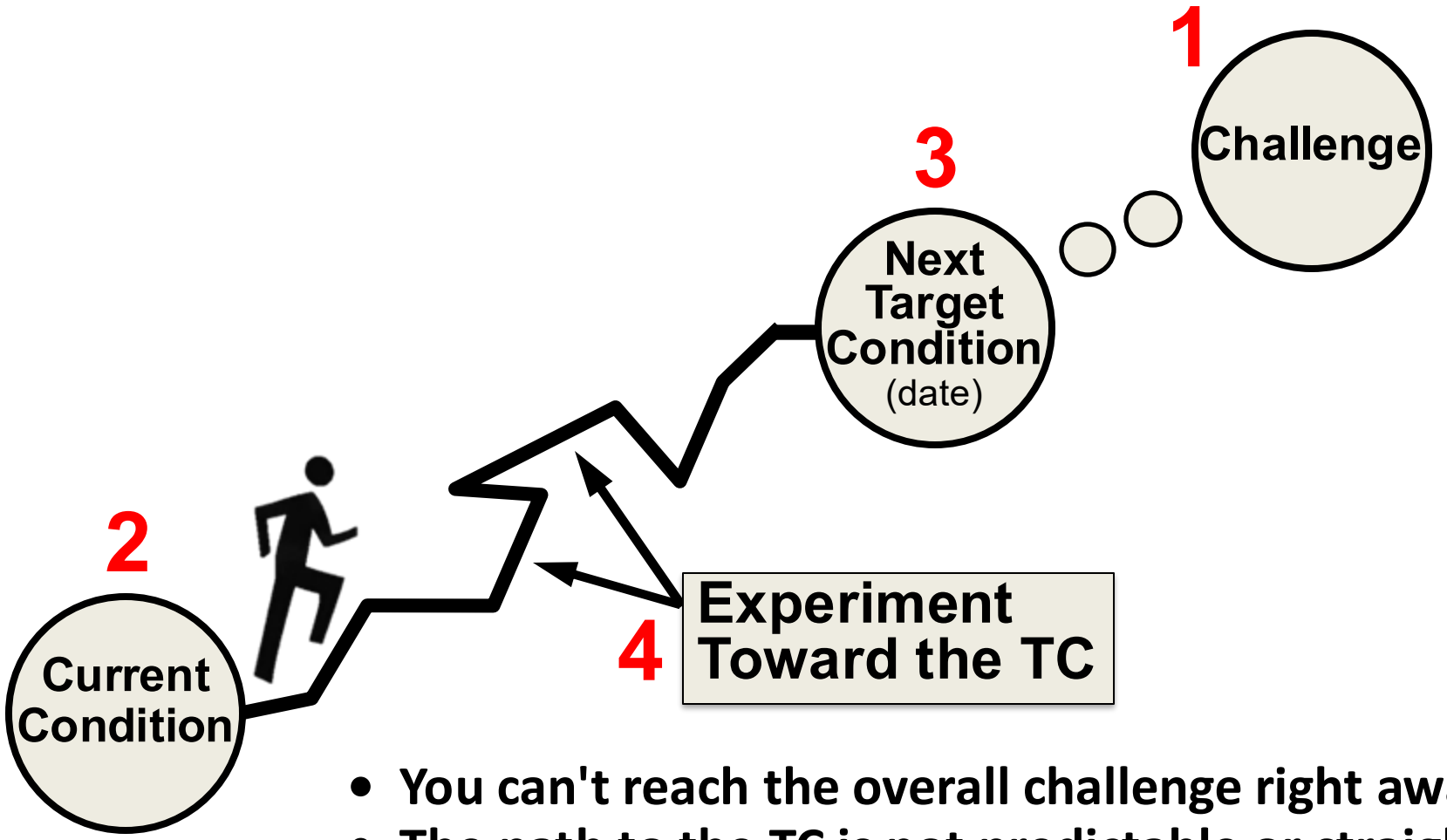
- Lean tools & practices
- Toyota's results

Less Visible Stuff

A systematic, scientific way of thinking and acting

WE FOUND A PATTERN AT TOYOTA

The four-step Improvement Kata model
A practical, scientific *Way of Improving*



- You can't reach the overall challenge right away.
- The path to the TC is not predictable or straight.
- You experiment to get there.

BUT A MODEL ALONE ISN'T ENOUGH

How do you acquire this way of thinking?

1
Challenge

3
Next Target Condition (date)

2
Current Condition

4
Experiment Toward the TC

ONE ANSWER

A Practical Scientific Thinking Pattern
+
Daily Routines of Deliberate Practice

= ***Making Scientific Thinking a Skill that Can be Learned by Anyone***

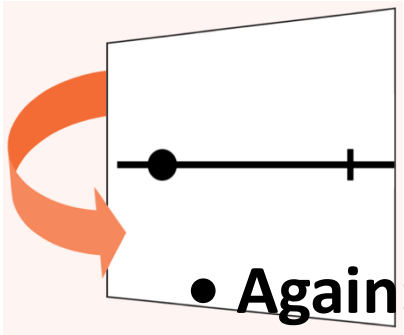
② SCIENTIFIC THINKING

What is it, and why teach it

A Practical Scientific Thinking Pattern
+
Daily Routines of Deliberate Practice

CARD – SIDE 1

- **Hold the card in front of you, dot on the left.**
- **<u>Close your left eye</u>. Stare at the dot with your right eye.**
- **Move the card in and out while staring at the dot.**
- **What happens?**

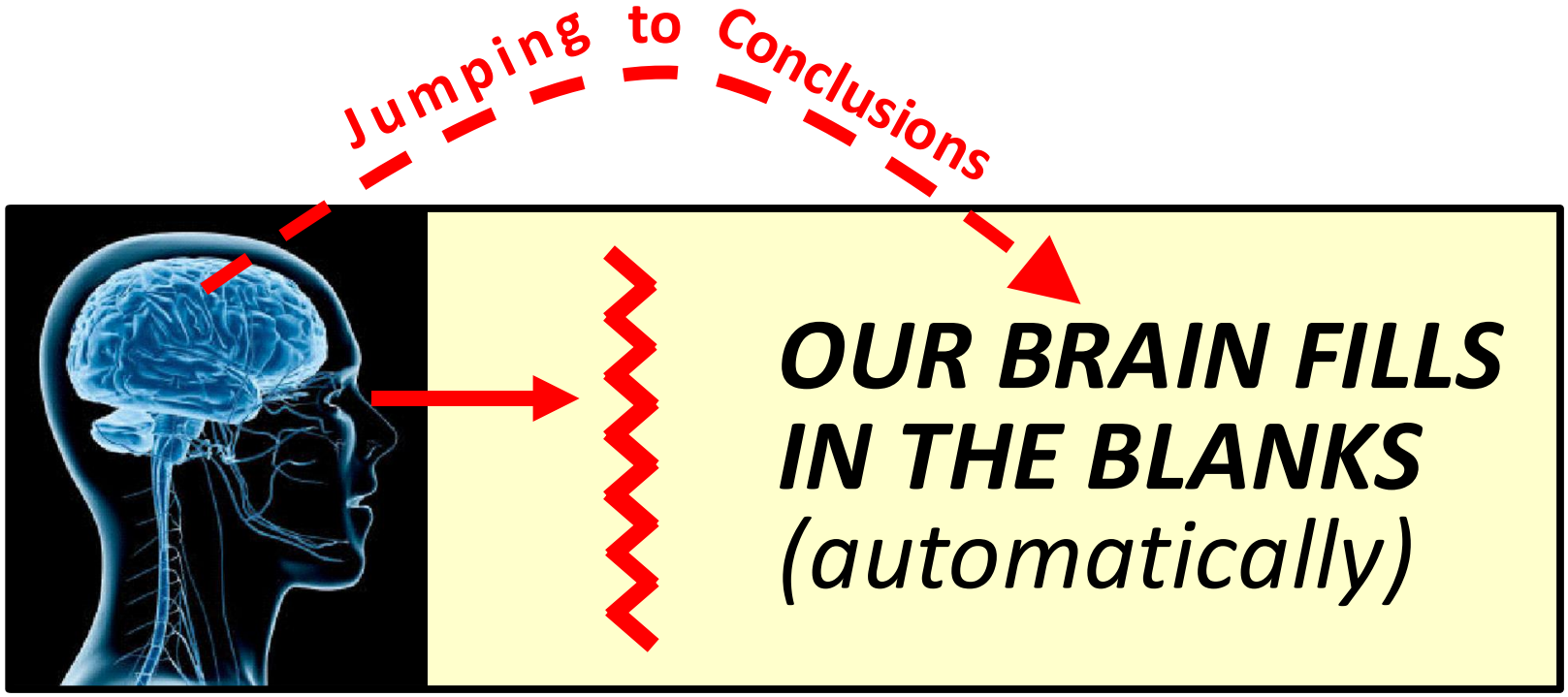


CARD – SIDE 2

- Again: card in front of you, dot on the left.
- Close your left eye. Stare at the dot with your right eye.
- Move the card in and out until the cross disappears.
- What happens this time?

THE BRAIN MAKES ASSUMPTIONS

Our brain creates feelings of certainty based on the bits of information it receives



We often don't notice a knowledge threshold because our brain is filling in blanks

THIS ASSUMPTION MECHANISM HELPS US GET THROUGH THE DAY

Our survival depends on it

Child's brain = exploring, but helpless.

Adult brain has many learned neural paths = performing.

BUT IT ALSO CAUSES PROBLEMS

We feel certain and make faulty decisions

JUMPING TO CONCLUSIONS

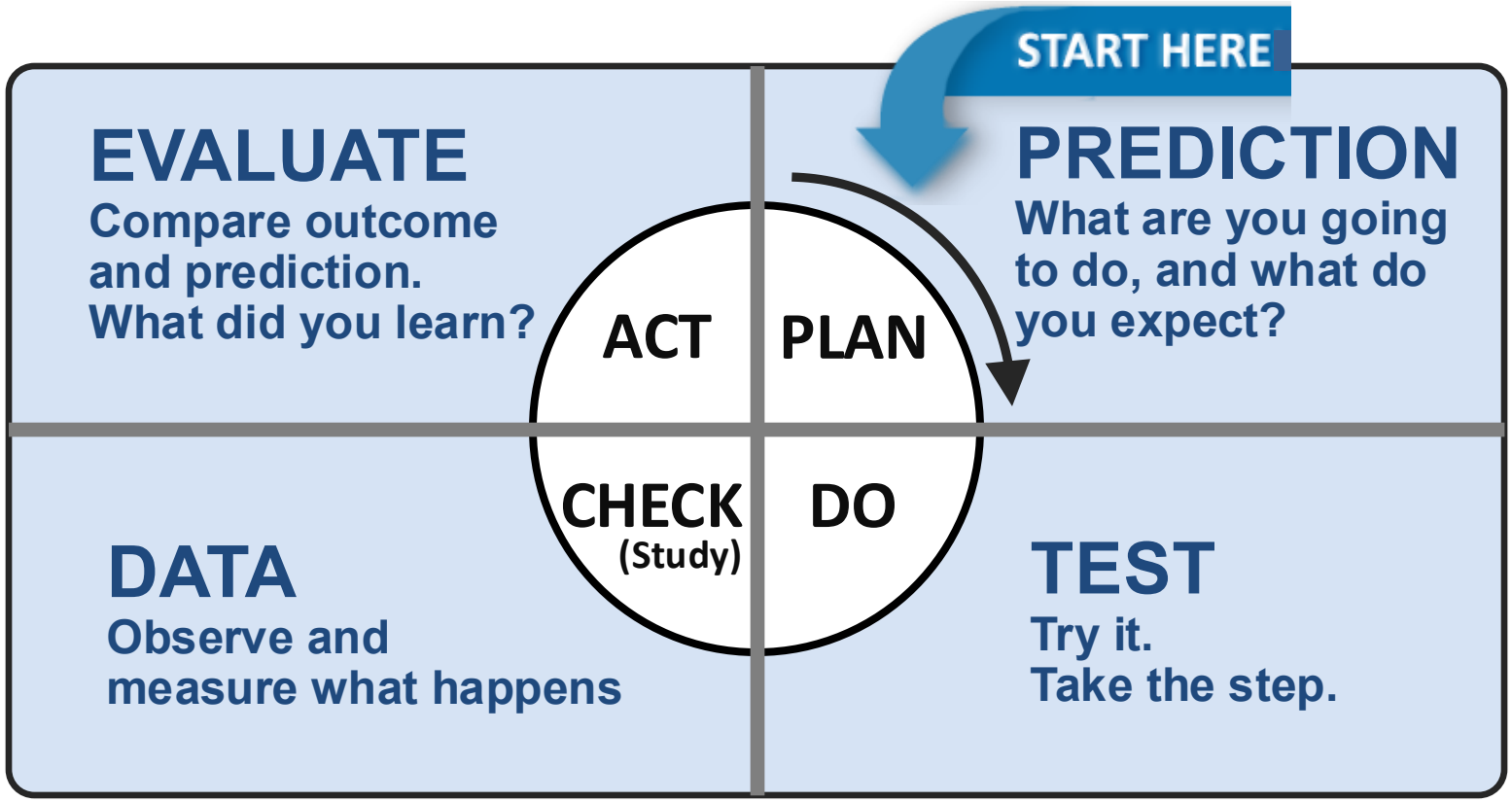
IUMRING TQ GQNGIUSIQNS

A COUNTERMEASURE: SCIENTIFIC THINKING

A routine of intentional coordination between what we predict will happen next, seeing what actually happens, and adjusting based on what we learn from the difference.

IT'S A LEARNING CYCLE

A process for acquiring knowledge that's sometimes called "Plan-Do-Check-Act"



Scientific thinking may be the most effective means we currently have for navigating through unpredictable territory toward challenging goals.

LET'S TRY THE SCIENTIFIC APPROACH

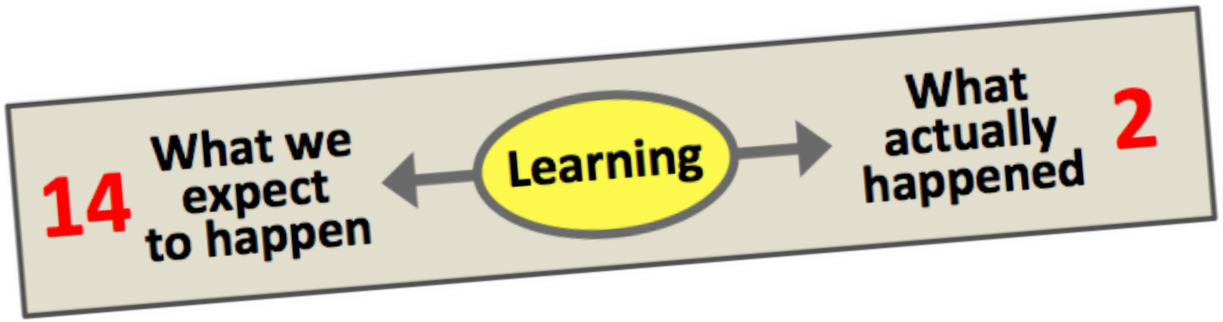
What will be the next number in this series?

Please write down your answer

2, 4, 6, 8, 10, 12, ?

ANSWER

2, 4, 6, 8, 10, 12, 2

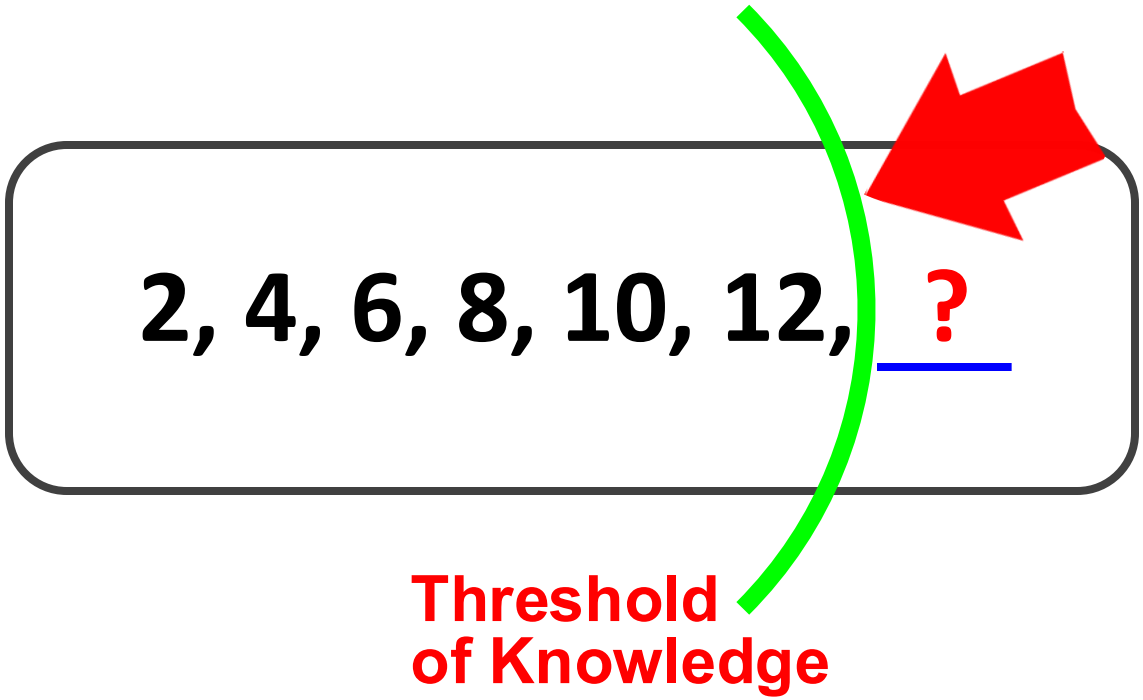


EXPERIMENTING

2, 4, 6, 8, 10, 12, 2

- **Notice that we are learning via a prediction error:**
  - **What theory did we have?**
  - **What if the correct answer had been "14"?**
- **What theory do we want to test now?**
- **If we test 100 times will we be certain?**

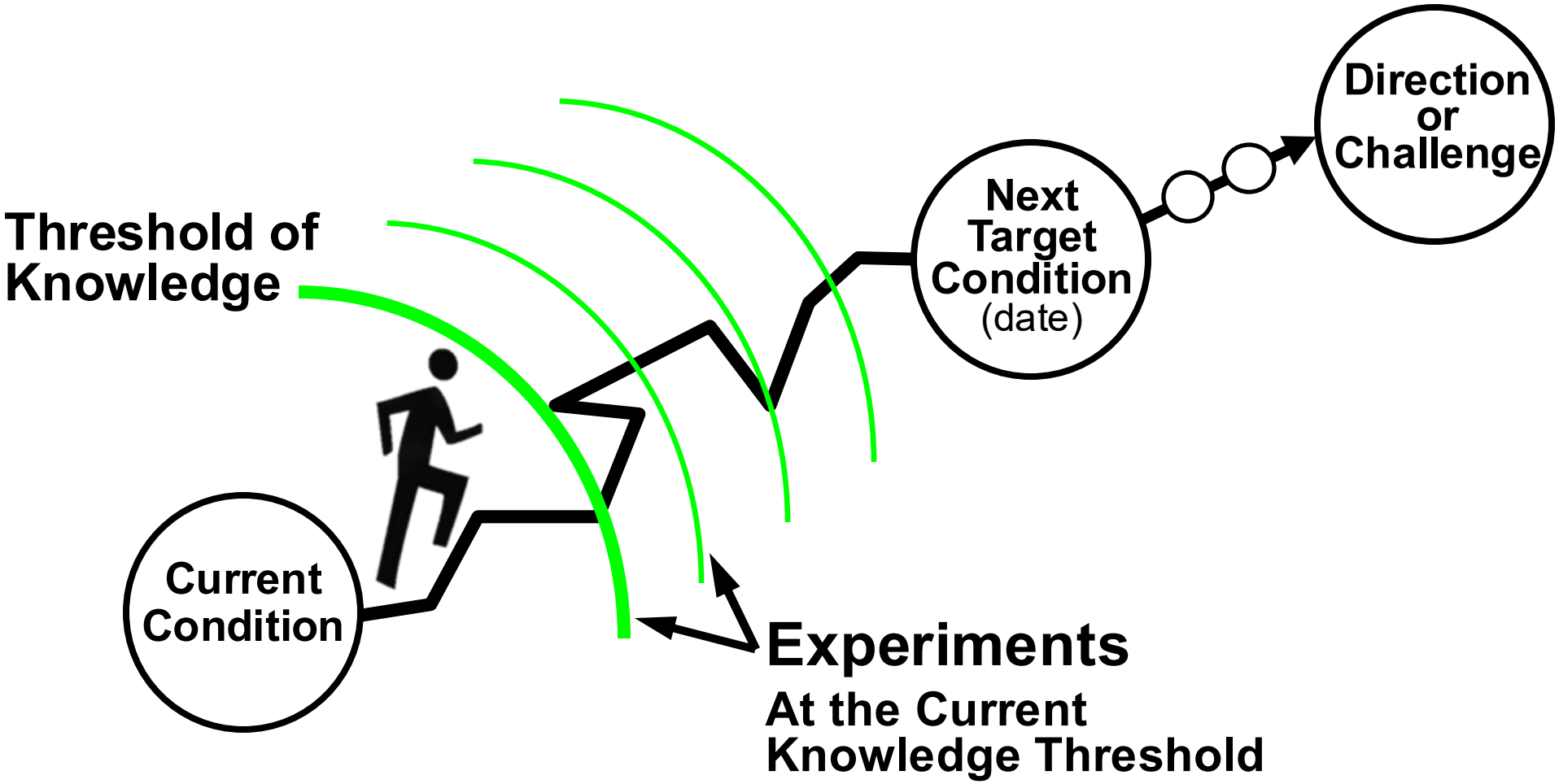
AT A KNOWLEDGE THRESHOLD WHAT WOULD BE A GOOD RESPONSE?



The threshold of knowledge is our *Learning Edge*, where your next experiment should take place.

And don't feel so bad about prediction errors!

THE IMPROVEMENT KATA IS A PRACTICAL PATTERN OF SCIENTIFIC THINKING



Here's the thing...

Scientific Thinking is Learned

~~Born~~?

Learned

It's not our default mode as adults. Adults are bad at scientific thinking, due to all those learned neural paths.

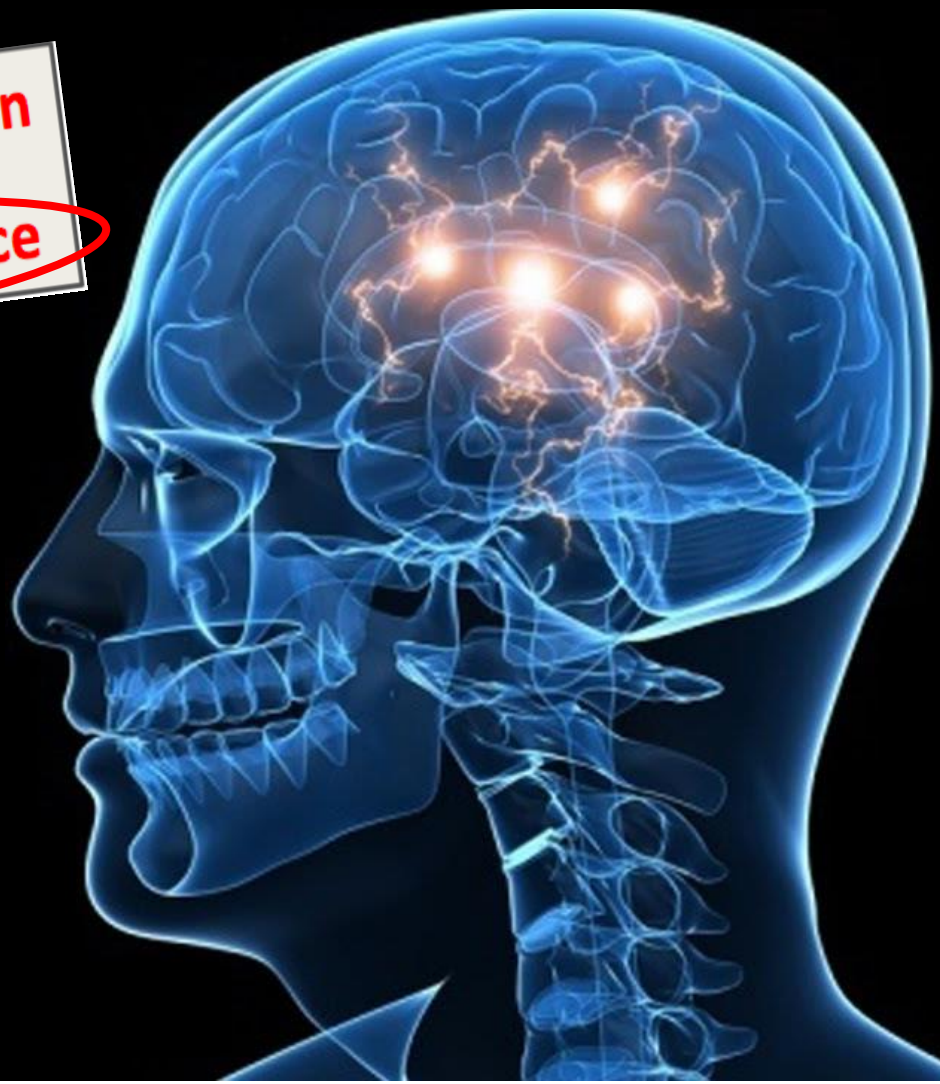
OK... HOW?

③ HOW DO YOU DEVELOP NEW SKILLS & MINDSET?

A Practical Scientific Thinking Pattern

+

Daily Routines of Deliberate Practice

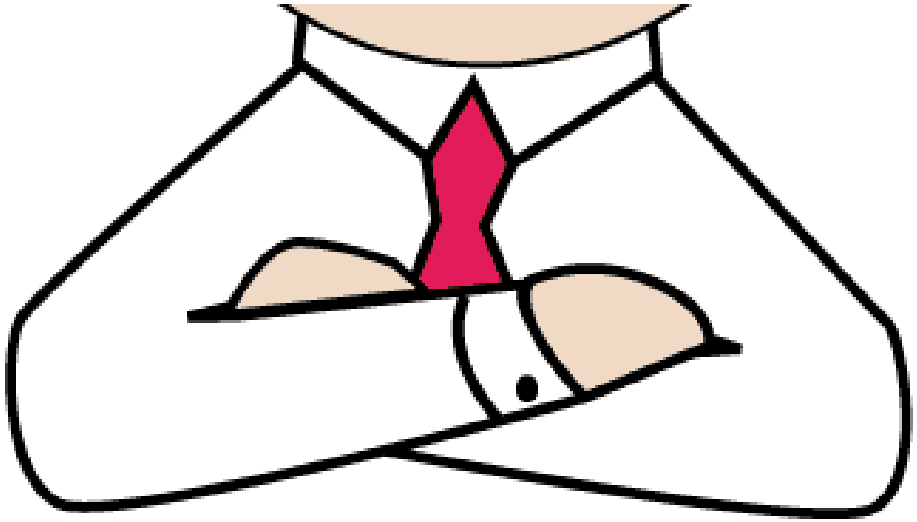


WHAT DOES IT TAKE TO LEARN NEW SKILLS AND CHANGE OUR THINKING?

Take a moment... please cross your arms

LET'S TRY JUST A SMALL CHANGE

Now re-cross them the other way



HOW DID IT FEEL THE SECOND TIME COMPARED TO THE FIRST?

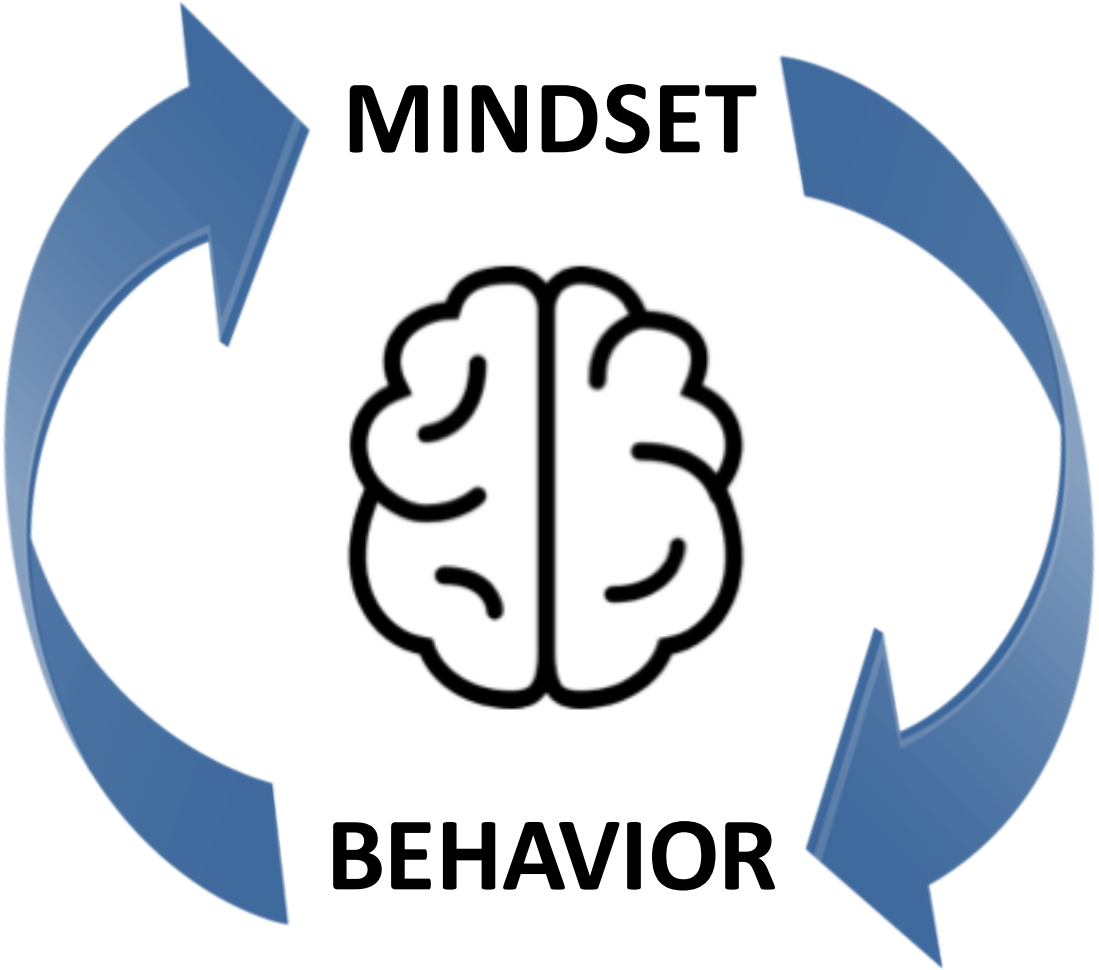
SECOND TIME

Awkward
Slow
Unnatural
Stiff
Uncomfortable
Difficult
It feels wrong
Had to think about it

What's going on here?

OUR THINKING PATTERNS ARE IN A LOOP

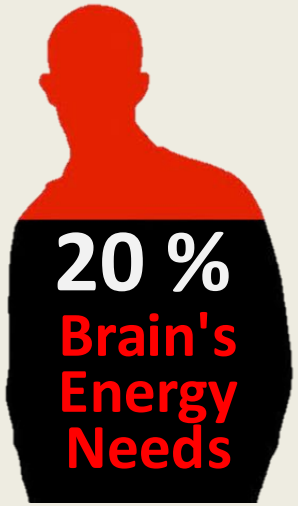
We've practiced folding our arms for decades



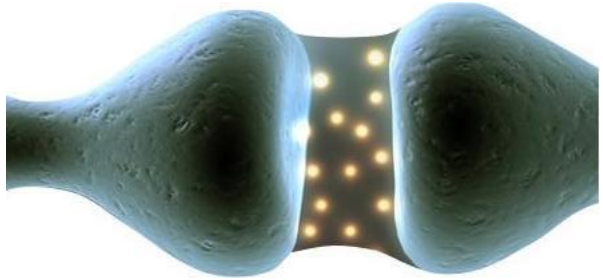
Every time you think or do something, you are more likely to do it again, because it writes & strengthens neural pathways

WHY THE 2nd TIME FEELS DIFFERENT

The brain strongly favors our practiced neural pathways, to conserve energy and for safety

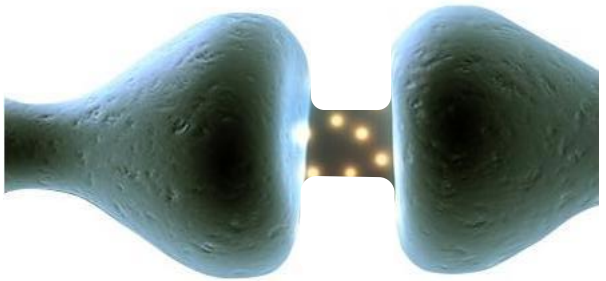


Fast & Efficient Neural Pathways
Our Habits



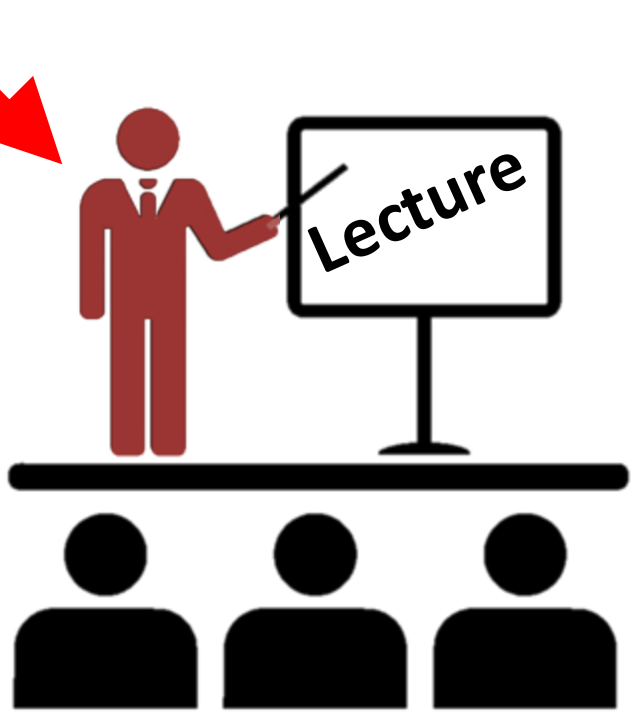
"Highways" in our brain. Takes little attention and energy.

Slow and Inefficient Neural Pathways
New Ways



Takes more attention and energy, at first

YOU CAN'T WIN THIS WAY



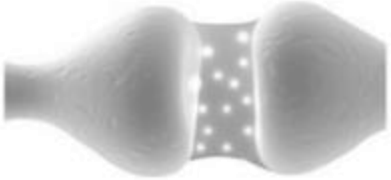
Trying to fight existing neural highways usually doesn't work.

The learner will almost always automatically stick with or revert back to their old way of doing things. It's physiological.

We don't think and act a certain way because we lack information. We do so because it's a habit.

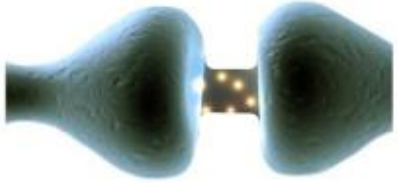
DON'T TRY TO FIGHT EXISTING NEURAL HIGHWAYS, BUILD NEW ONES

Fast & Efficient
Neural Pathways
Our Habits



"Highways" in our brain. Takes little attention and energy.

Slow and Inefficient
Neural Pathways
New Ways



Takes more attention and energy, at first

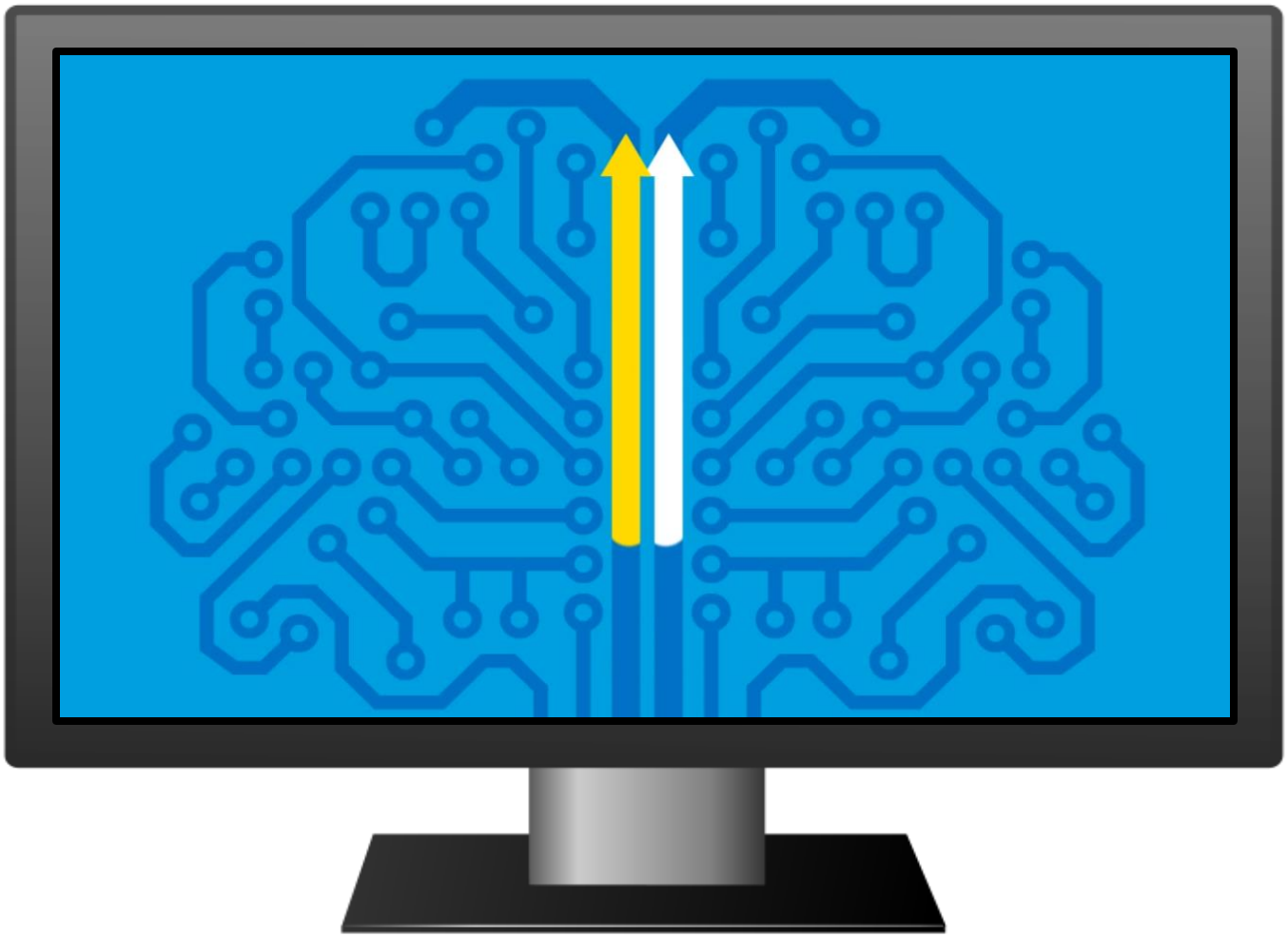
What can work: Deliberately practicing a new routine.

Focus on developing new neural pathways, i.e. building <u>new</u> habits.

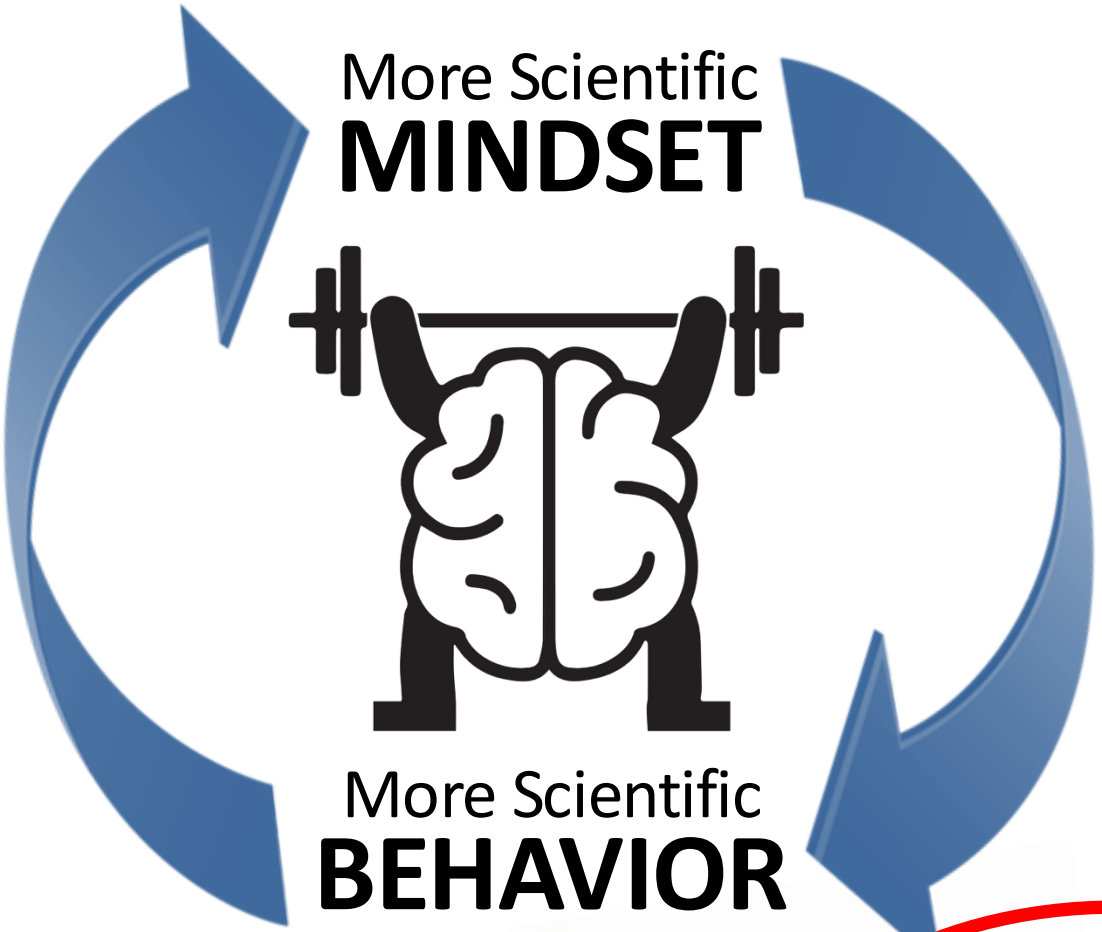
Grow new thinking, that eventually replaces the old

HOW WE ACQUIRE NEW SKILLS & MINDSET

(2 minutes)



THIS IS WHERE KATA COME IN

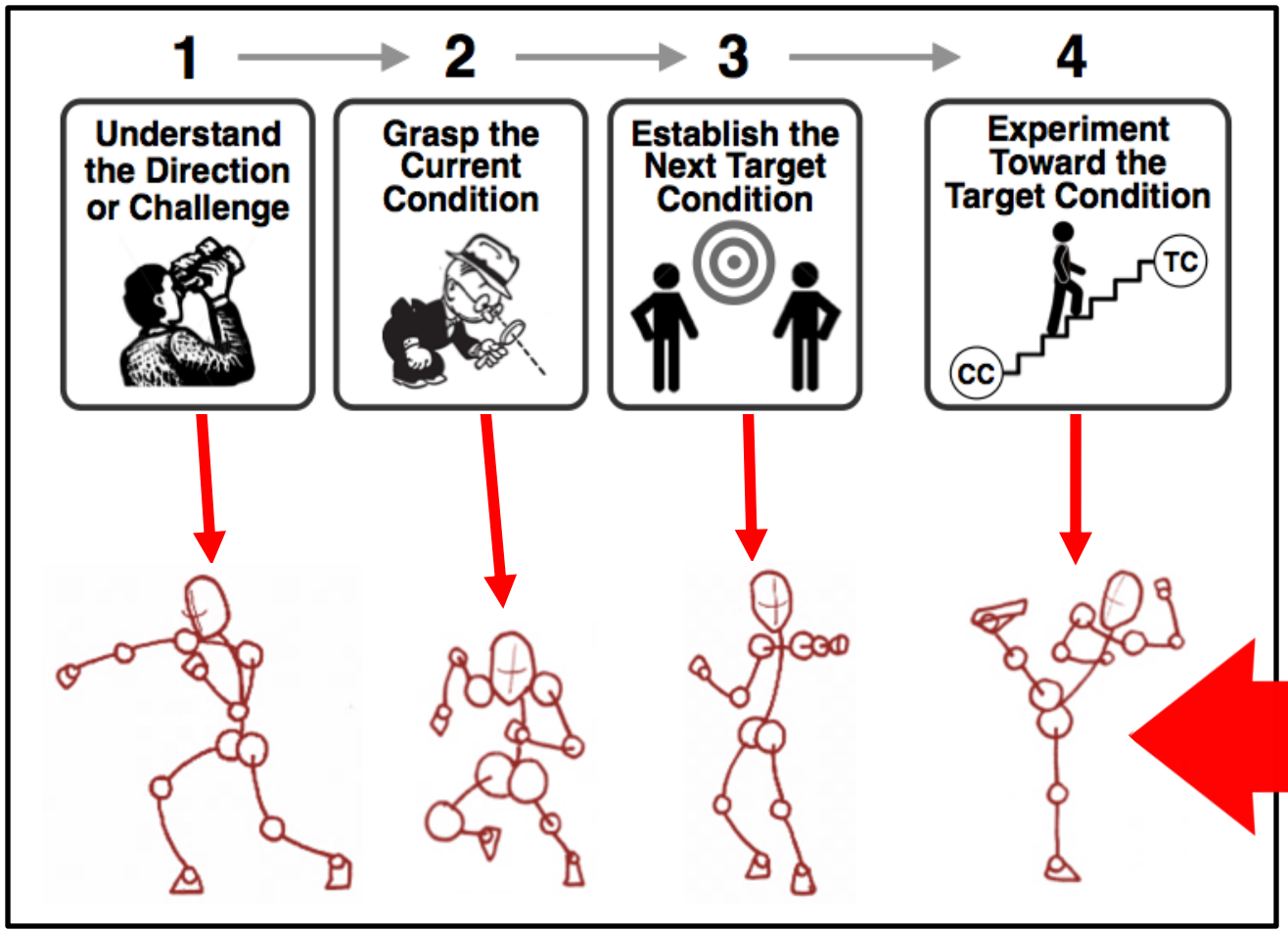


It's not just repetition:
- **Practice the right pattern, i.e. correct errors (need a coach).**
- **Takes some positive emotions.**

STARTER KATA

There are simple practice routines for each step of the IK model, to learn fundamental skills. They're a starting point for any individual, team or organization who would like to develop a scientific-thinking mindset and approach.

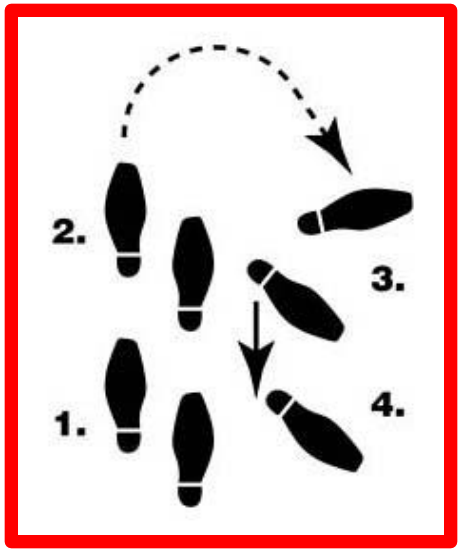
The IK Model



STARTER KATA to begin to operationalize the IK pattern

STARTER KATA = AIDS FOR FIRST PRACTICE

They're building-block practice routines that help you learn fundamentals and adopt new ways of acting and thinking



- **Not a problem-solving method. They're practice routines to make you a better problem solver.**
- **Doesn't replace improvement methods you have.**
- **Can't *implement* Kata, you can only practice them.**

DON'T START WITH A 20-MILE RUN!

(4 minutes)

THERE'S ALSO A COACHING KATA

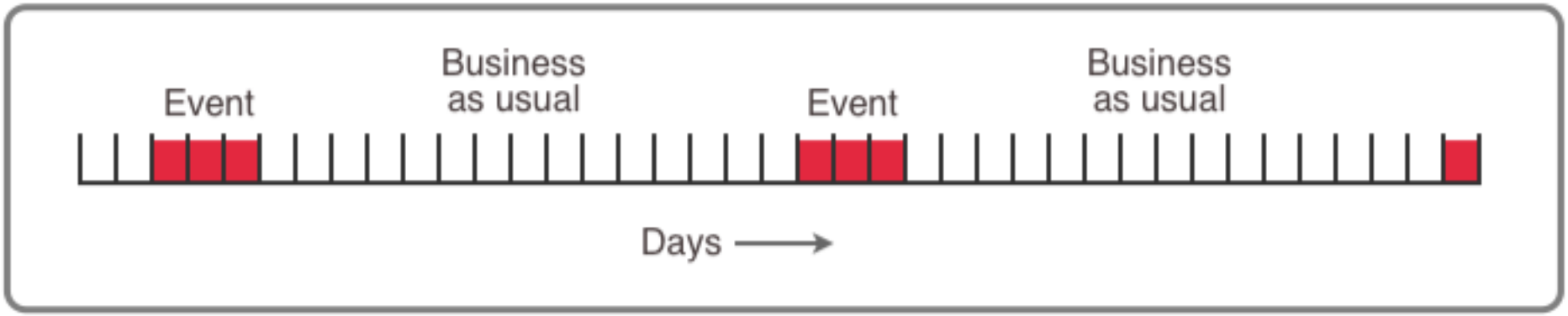
Practice assessing the learner's current practice and giving corrective, situational feedback to each learner

IK
Practicing Improvement Skills

CK
Practicing Coaching Skills
(The Manager)

DAILY PRACTICE

20 minutes a day is better than two hours once a week. If you practice only periodically and the rest of the time it's business as usual, then what you are actually practicing is *business as usual*.



This means:

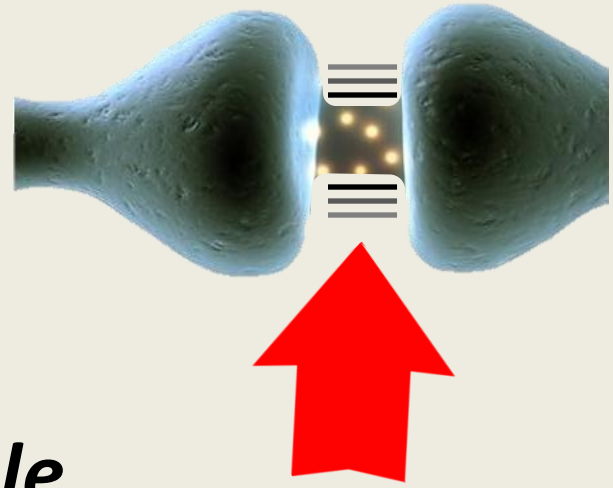
- **Practice should be part of daily work.**
- **Coaches should be line managers, because they are there every day.**

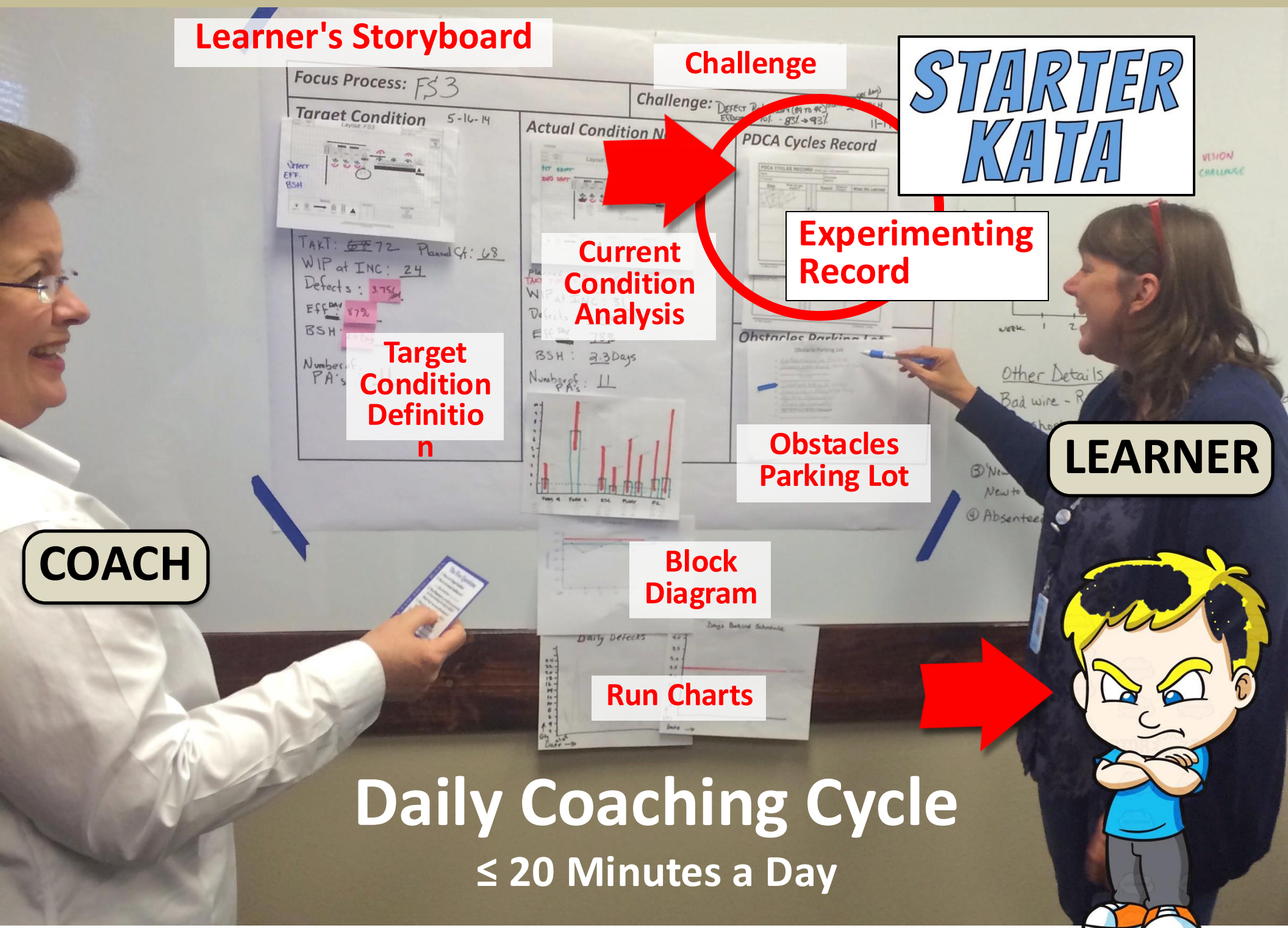
THIS IS WHAT YOU *WANT* TO FEEL

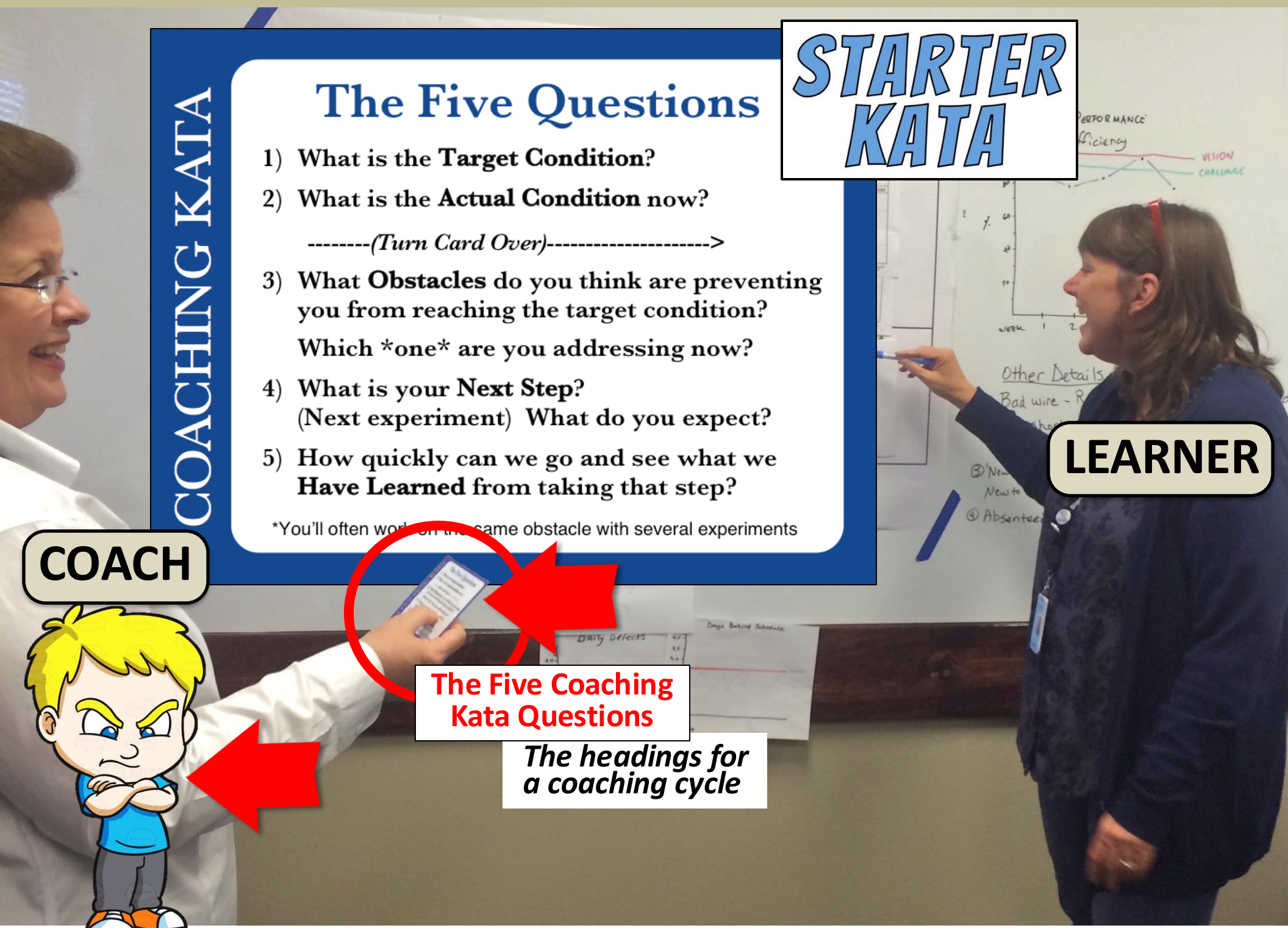
It means you're building new neural pathways (learning)

This feeling indicates learning

Awkward
Slow
Unnatural
Stiff
Uncomfortable
Difficult
It feels wrong
Had to think about it

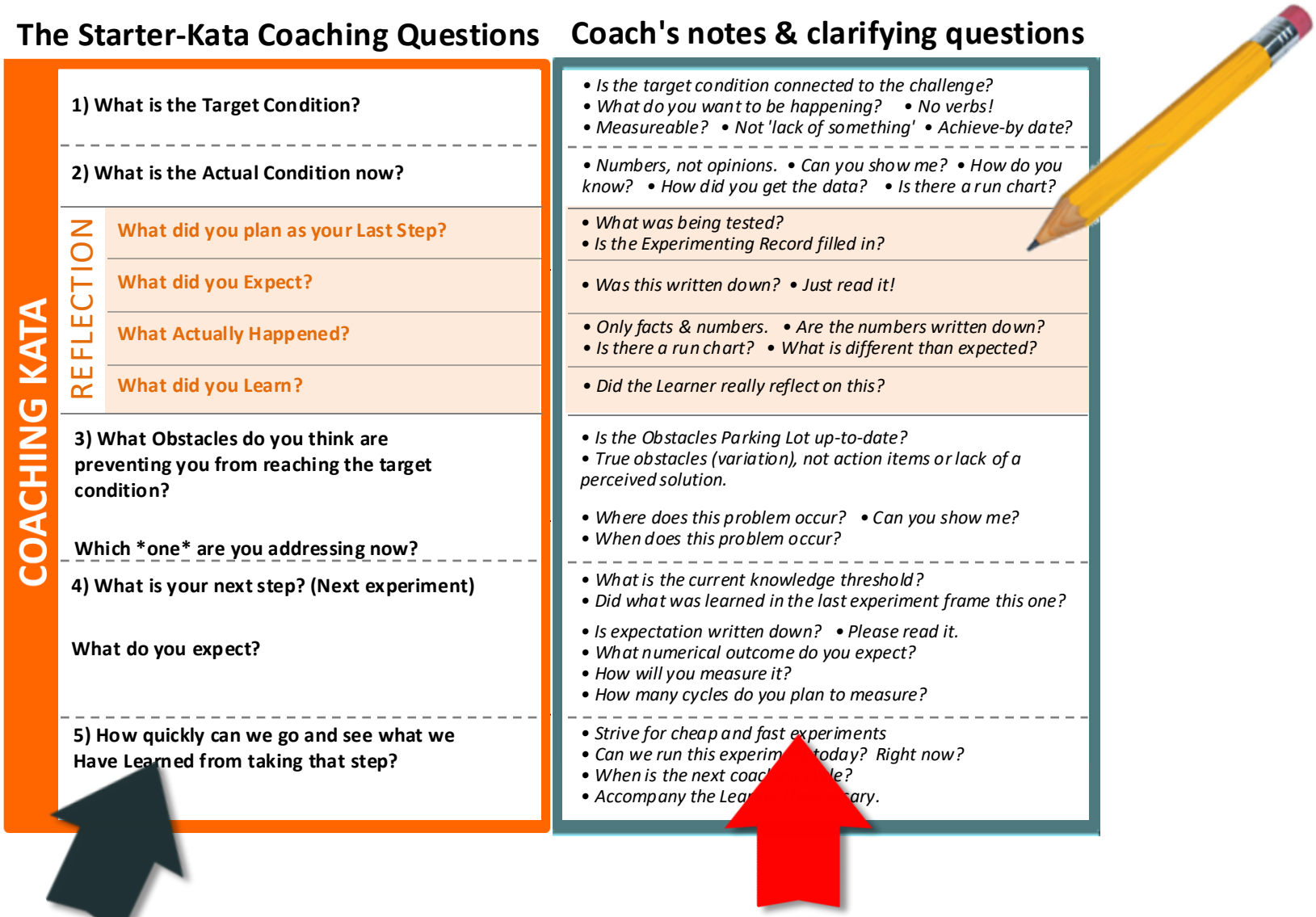



Learner's Storyboard
Challenge
STARTER KATA
Current Condition Analysis
Experimenting Record
Target Condition Definitio n
Obstacles Parking Lot
COACH
LEARNER
Block Diagram
Run Charts
Daily Coaching Cycle
≤ 20 Minutes a Day


COACHING KATA
The Five Questions
1) What is the Target Condition?
2) What is the Actual Condition now?
--------(Turn Card Over)---------->
3) What Obstacles do you think are preventing you from reaching the target condition?
Which *one* are you addressing now?
4) What is your Next Step?
(Next experiment) What do you expect?
5) How quickly can we go and see what we Have Learned from taking that step?
*You'll often work on the same obstacle with several experiments
STARTER KATA
COACH
LEARNER
The Five Coaching Kata Questions
The headings for a coaching cycle

THEN GO BEYOND THE FORMAL KATA

Develop your own way - by building on the fundamentals



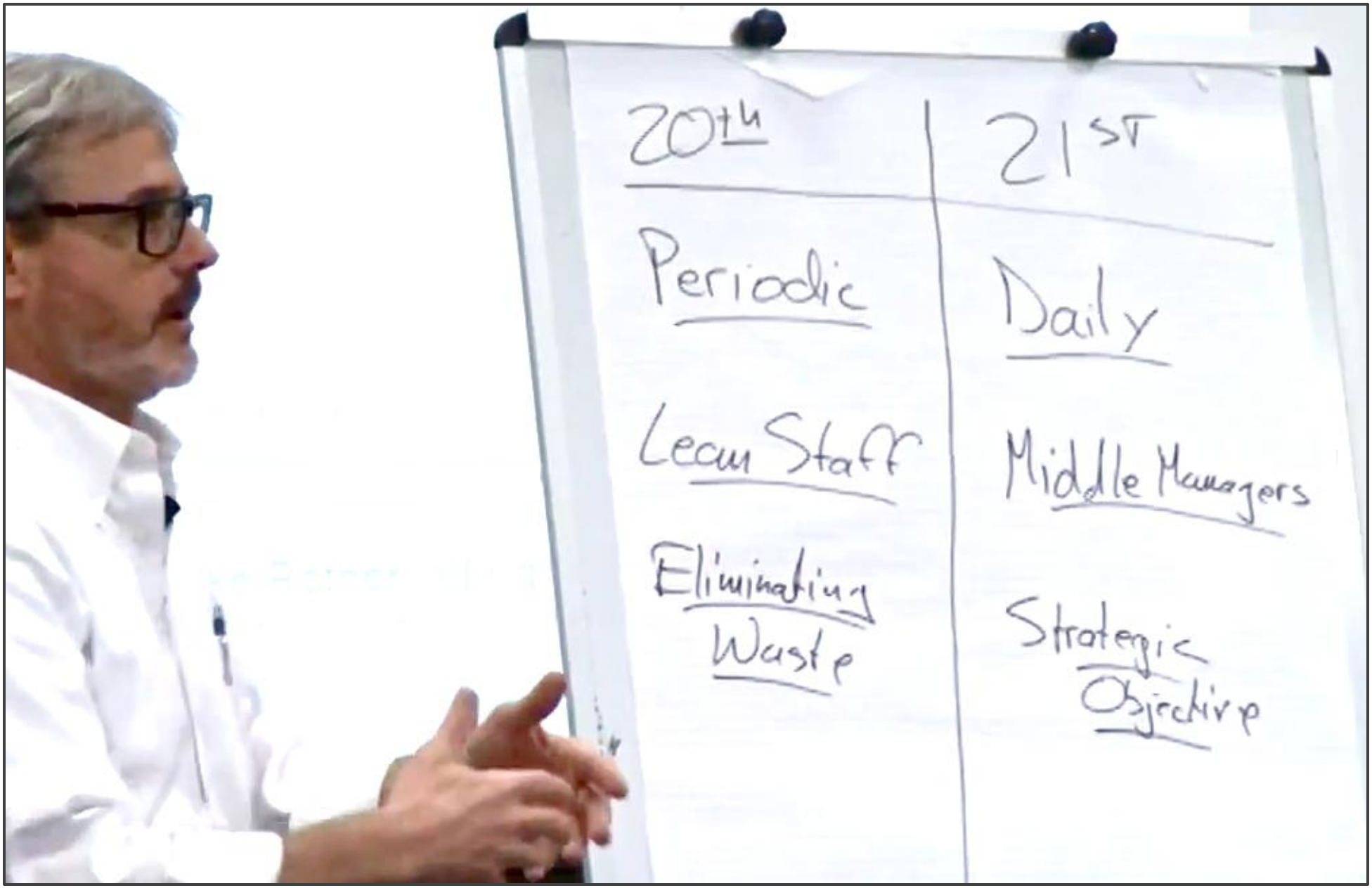
Starter Kata

Additional clarifying questions that this coach is adding

SUMMARY

- ✓ **Knowing isn't the same as doing. Benchmarking is not enough to make change happen.**
- ✓ **Scientific thinking is a good way to navigate, but it is not our default mode.**
- ✓ **Skills, habits and mindset are wired in our brain.**
- ✓ **You can practice *Starter Kata* (with some coaching) to help wire your brain for scientific thinking.**
- ✓ **You can also modify an organization's culture this way, with managers as the coaches.**

A SHIFT TO "21ST CENTURY LEAN"

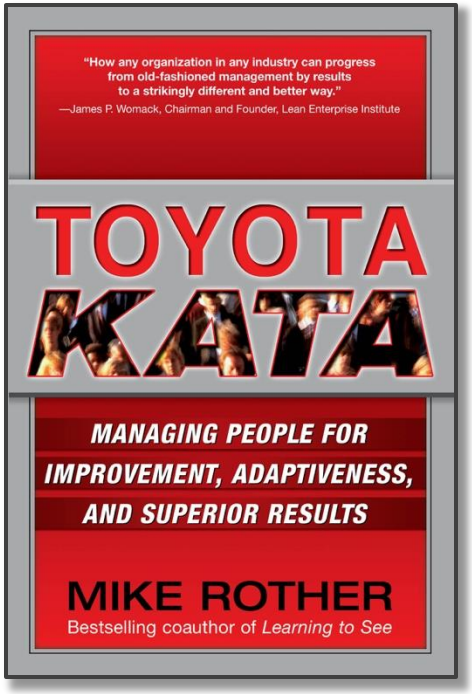


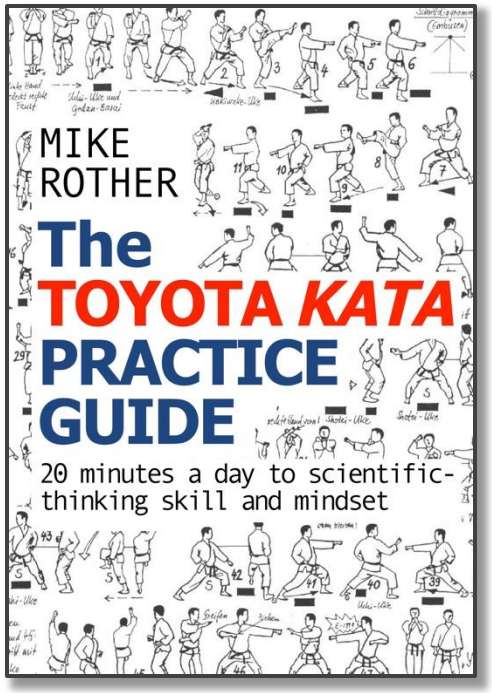
THINGS YOU CAN DO AFTER TODAY

TK Website: *Info, Videos, Materials*

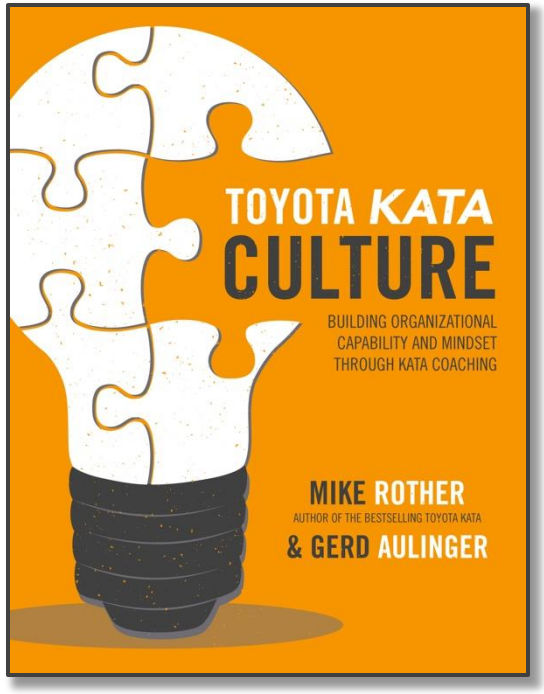
AFTER TODAY

TK Books





October 2017



May 2017

ONLINE IK/CK BASICS COURSE

Contact Bill Kraus at Arkansas Manufacturing Solutions for access to the online course!

A way to get the Kata basics, so your practice can be better

AFTER TODAY

Kata in the Classroom

www.katatogrow.com

Run the exercise in your company and invite some teachers.
Takes ~ 90 minutes.

Best wishes for your practice!

KATACON 3 INTERNATIONAL