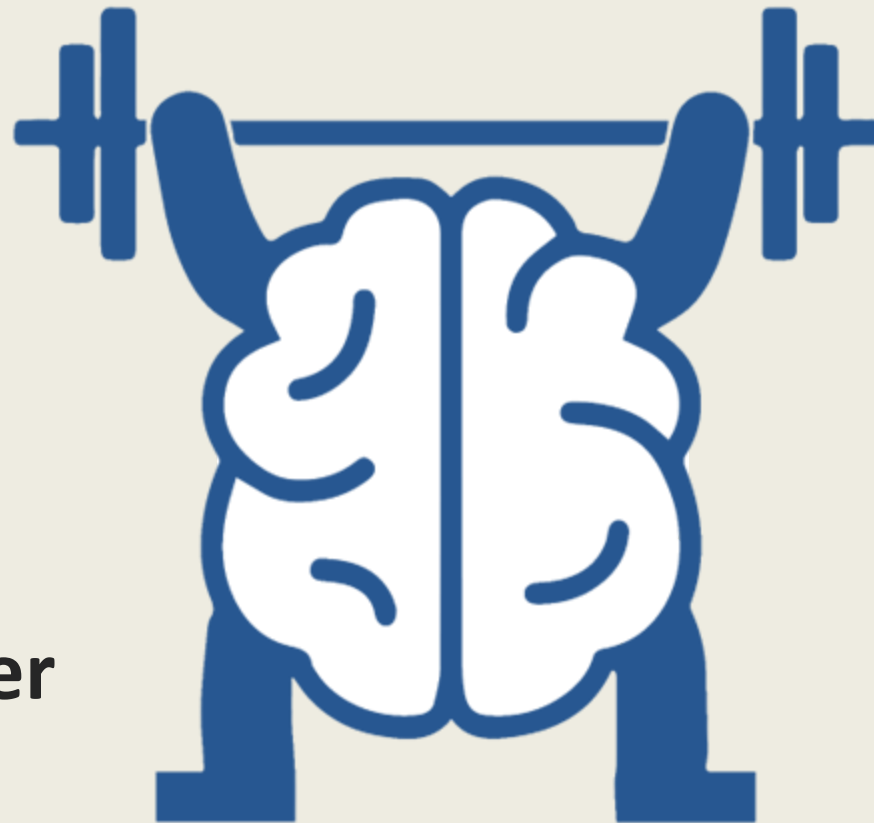


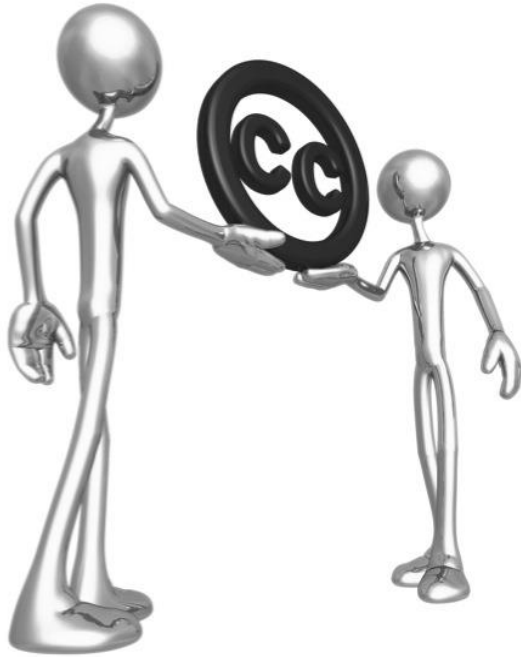
TOYOTA *KATA*

**Daily Practice for
Scientific-Thinking Skill, Mindset & Culture**



**By
Mike Rother**

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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 Improvement, Adaptiveness
and Superior Results

***Visible
Stuff***

- Lean tools & practices
- Toyota's results



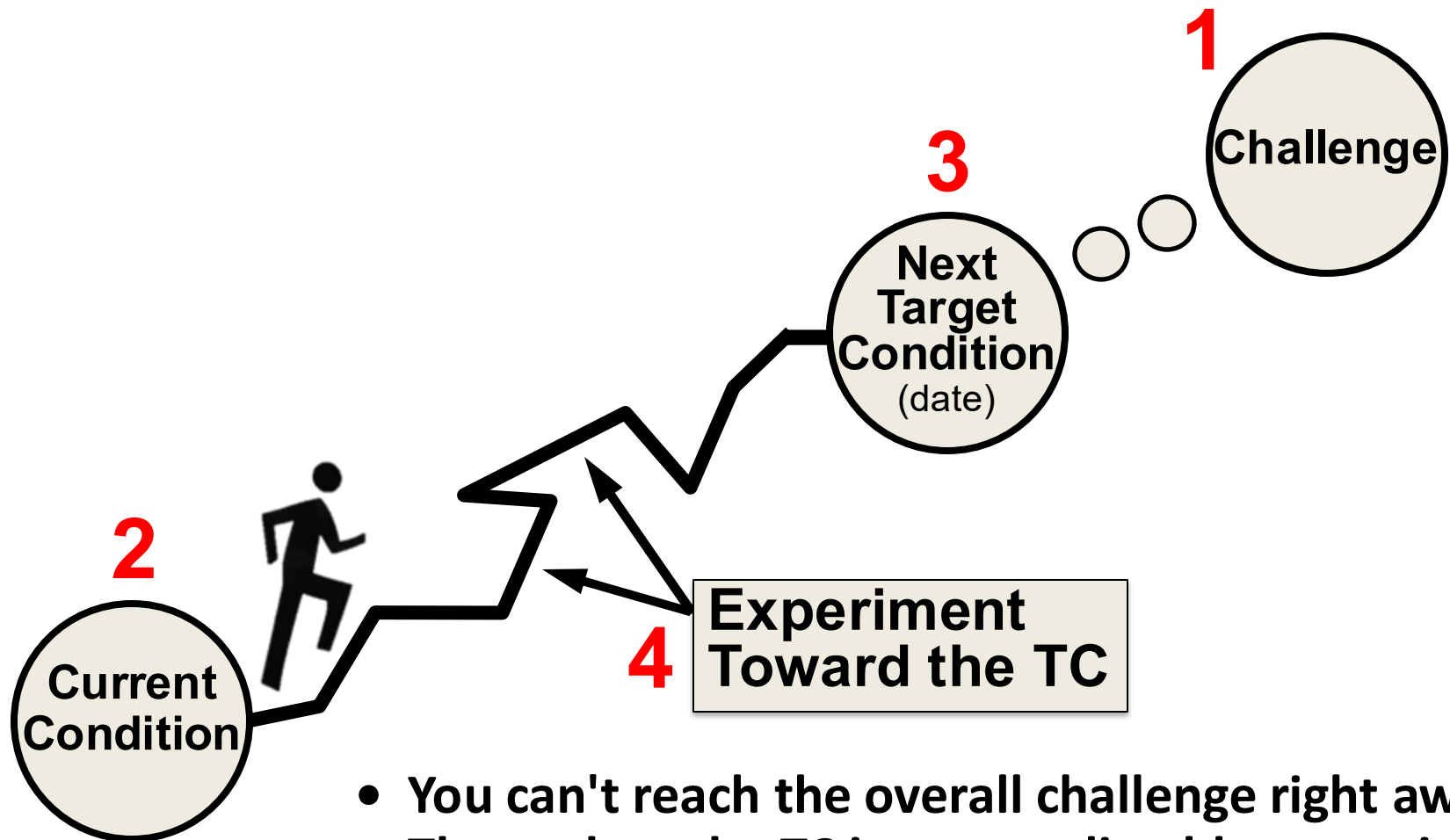
***Less
Visible
Stuff***

A systematic,
scientific way of
thinking and acting



WE FOUND A PATTERN AT TOYOTA

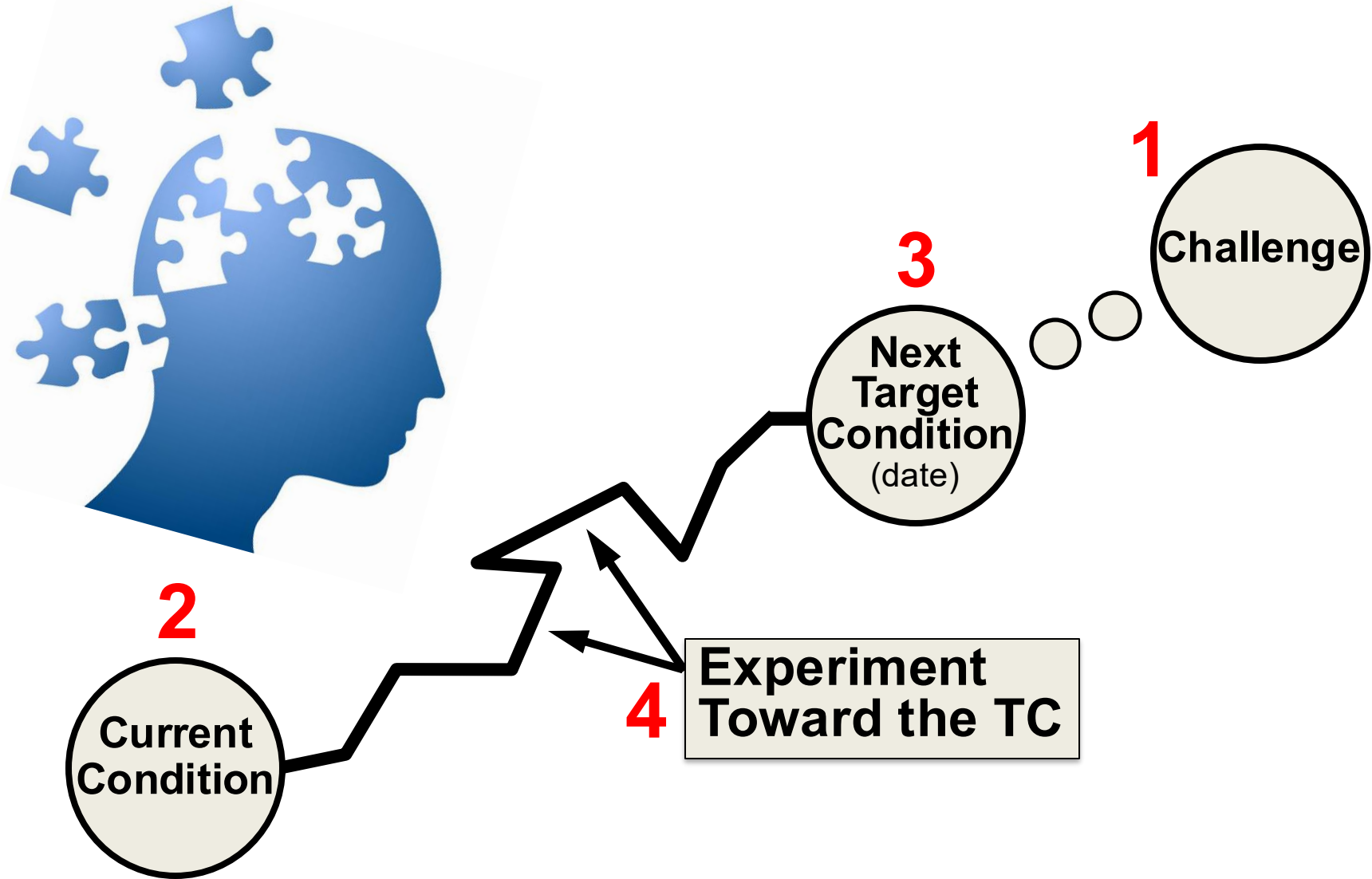
The four-step Improvement Kata **model**
A practical, scientific *Way of Improving*



- 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?





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

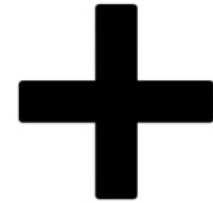
What is it, and why teach it

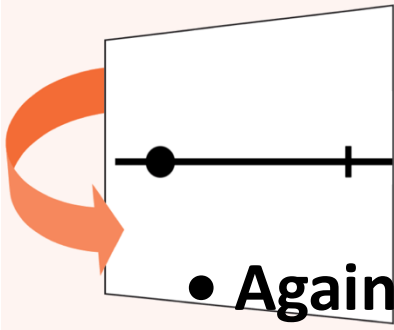
A Practical Scientific Thinking Pattern
+
Daily Routines of Deliberate Practice



CARD – SIDE 1

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





CARD – SIDE 2

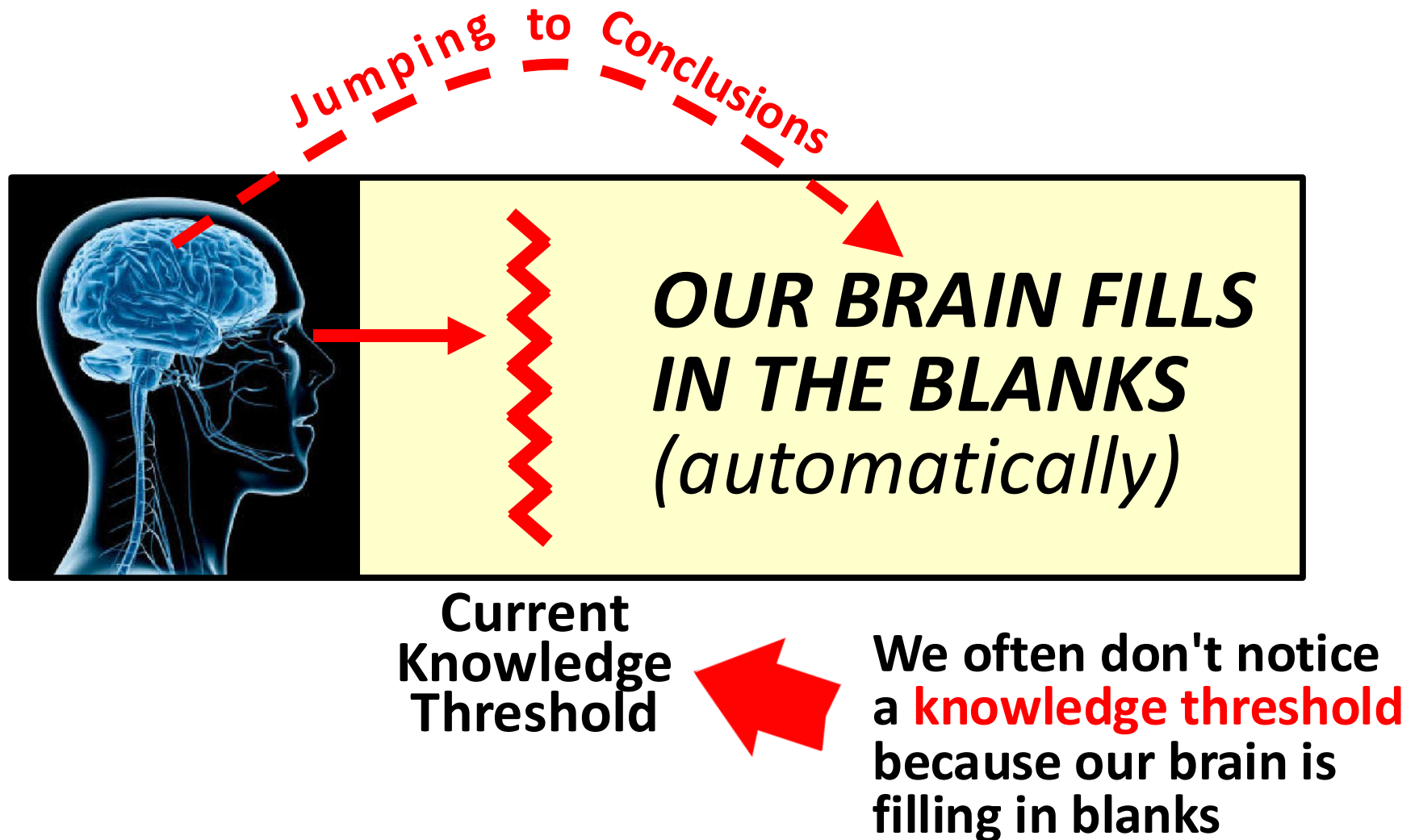


- **Again:** card in front of you, dot on the left.
- **Close your left eye.** Stare at the dot with your right eye.
- **Move the card in and out until the cross disappears.**
- **What happens this time?**



THE BRAIN MAKES ASSUMPTIONS

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



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~~

JUMPING TO CONCLUSIONS





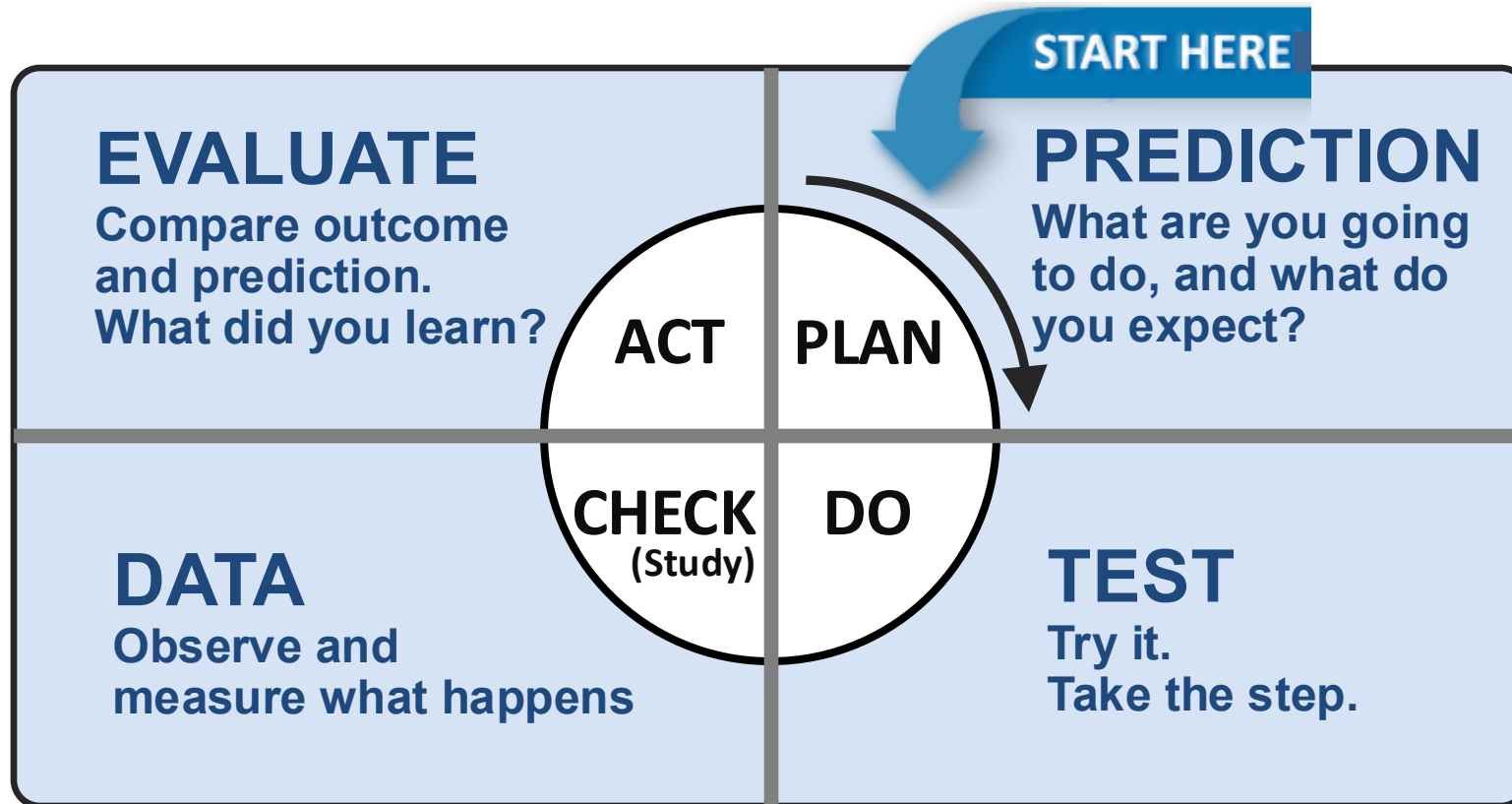
A COUNTERMEASURE: **SCIENTIFIC THINKING**

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

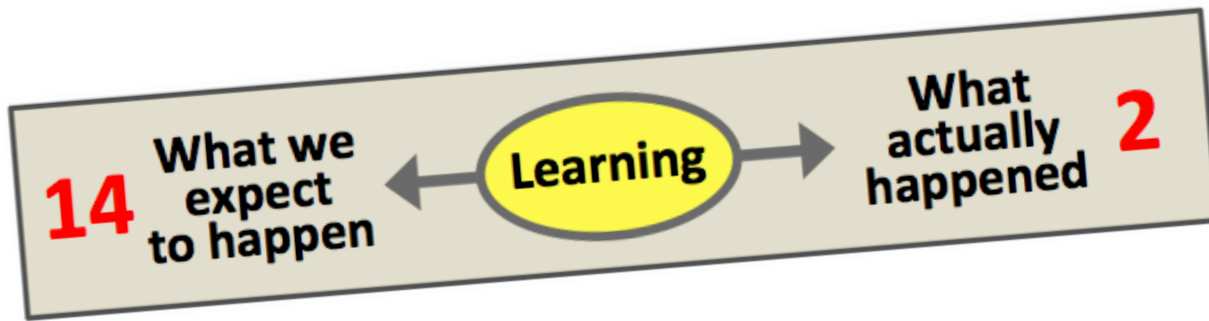
What will be the next number in this series?

Please write down your answer

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

ANSWER

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

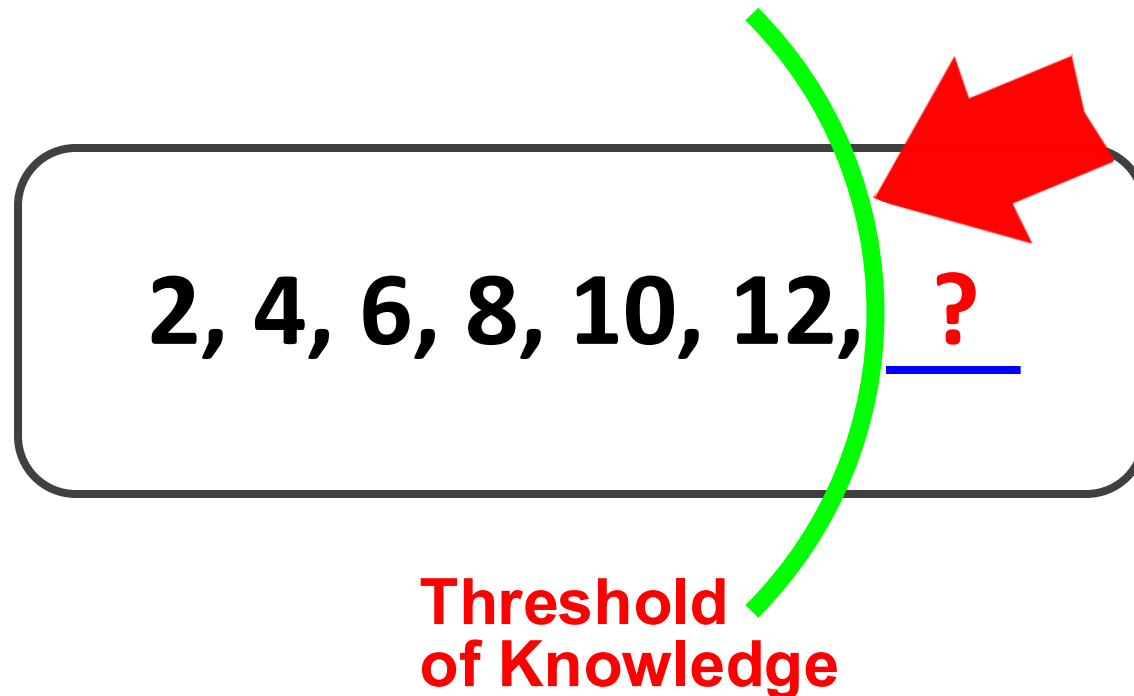


EXPERIMENTING

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?

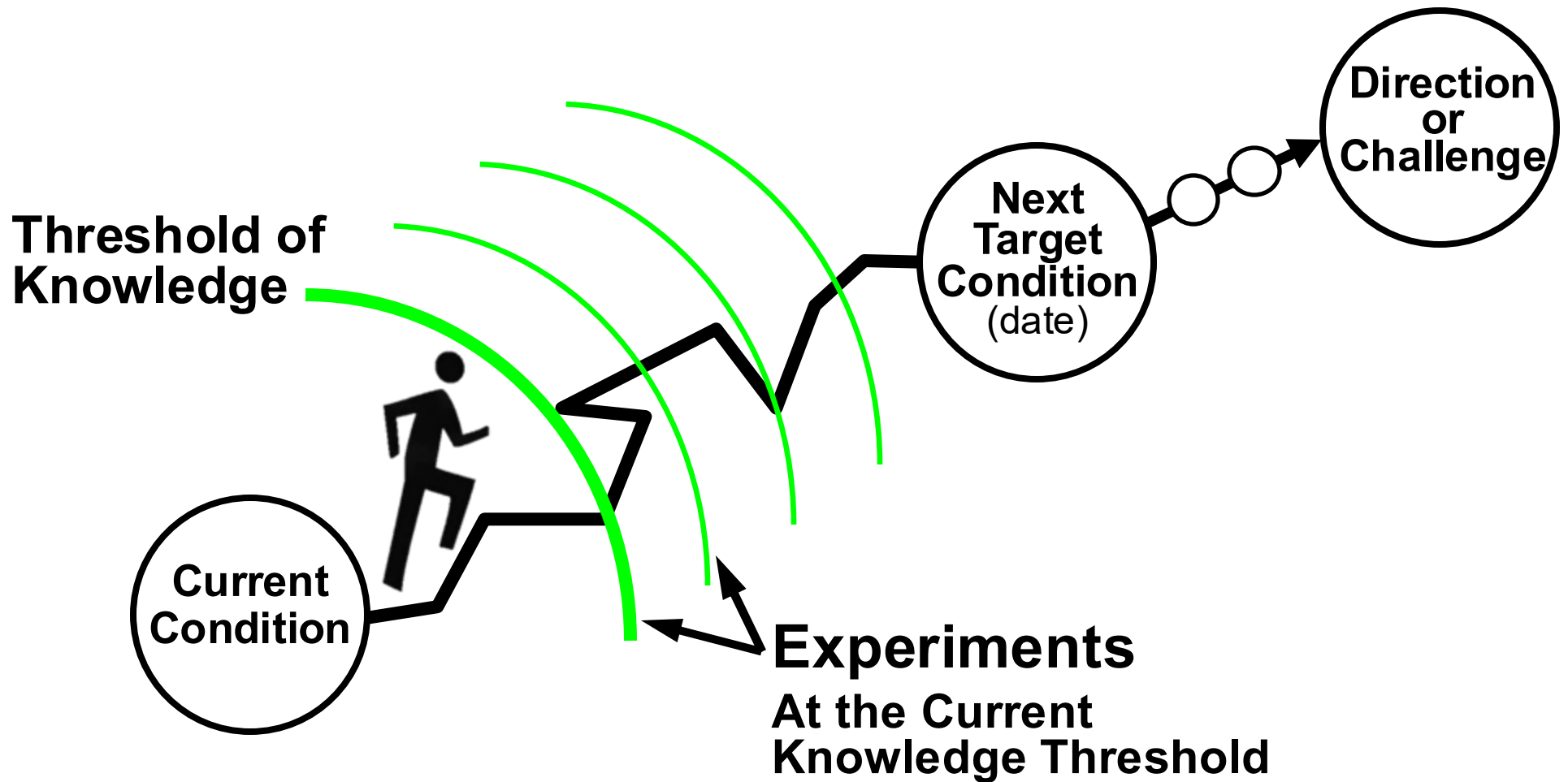
AT A KNOWLEDGE THRESHOLD WHAT WOULD BE A GOOD RESPONSE?



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

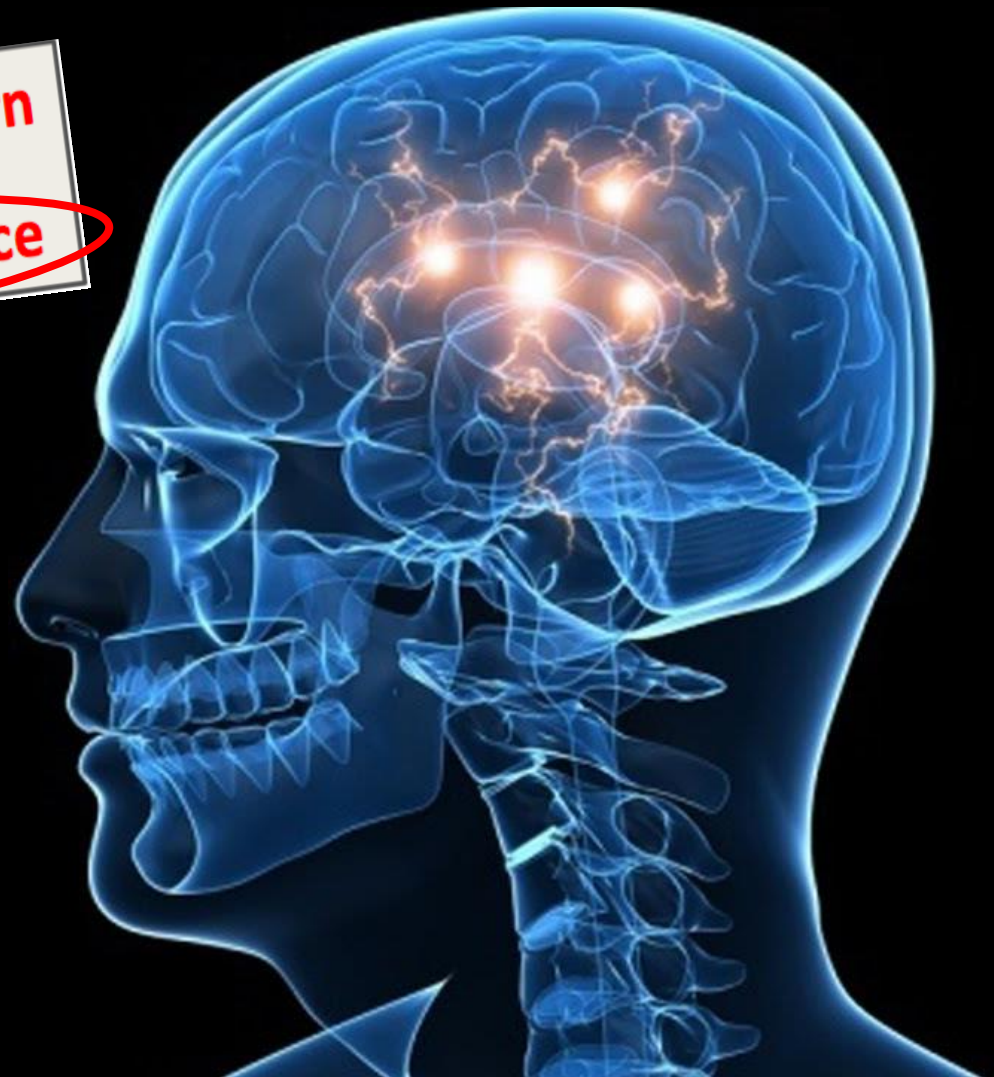
It's not our default mode as adults. Adults are bad at scientific thinking, due to all those learned neural paths.

OK... HOW?

③

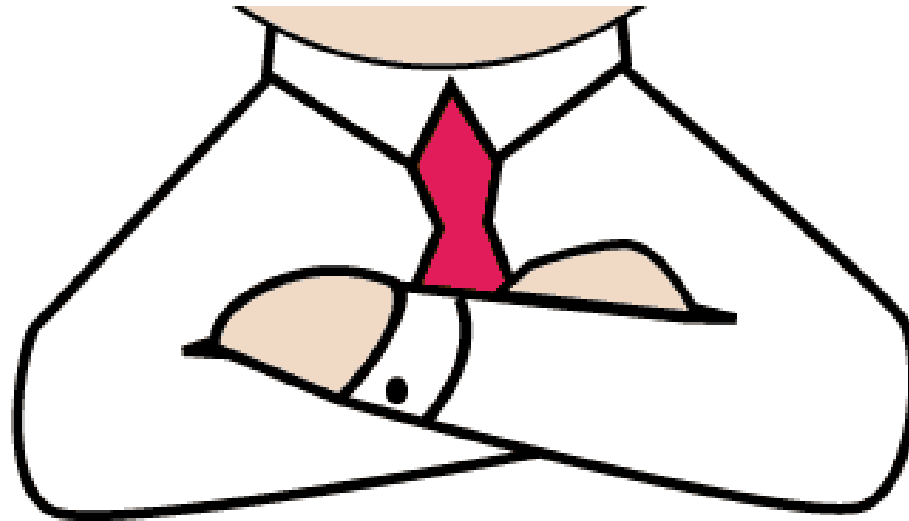
HOW DO YOU DEVELOP NEW SKILLS & MINDSET?

A Practical Scientific Thinking Pattern
+
Daily Routines of Deliberate Practice



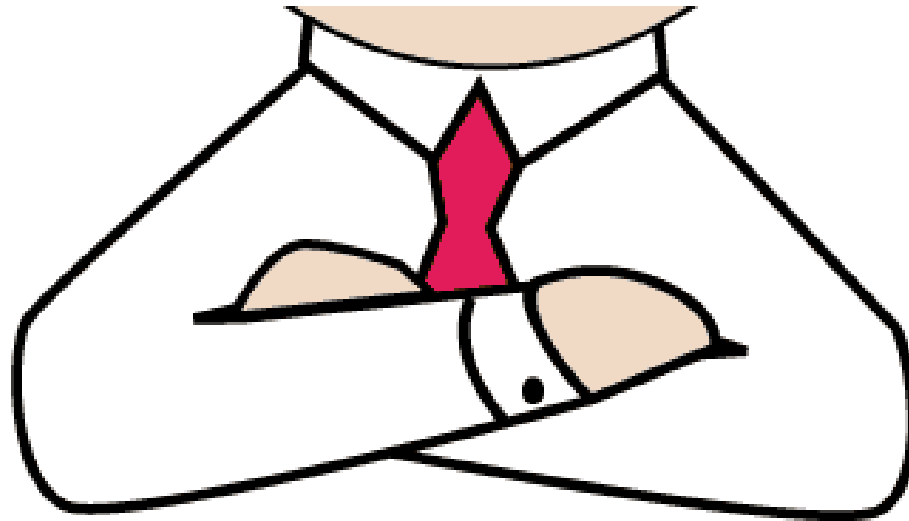
WHAT DOES IT TAKE TO LEARN NEW SKILLS AND CHANGE OUR THINKING?

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



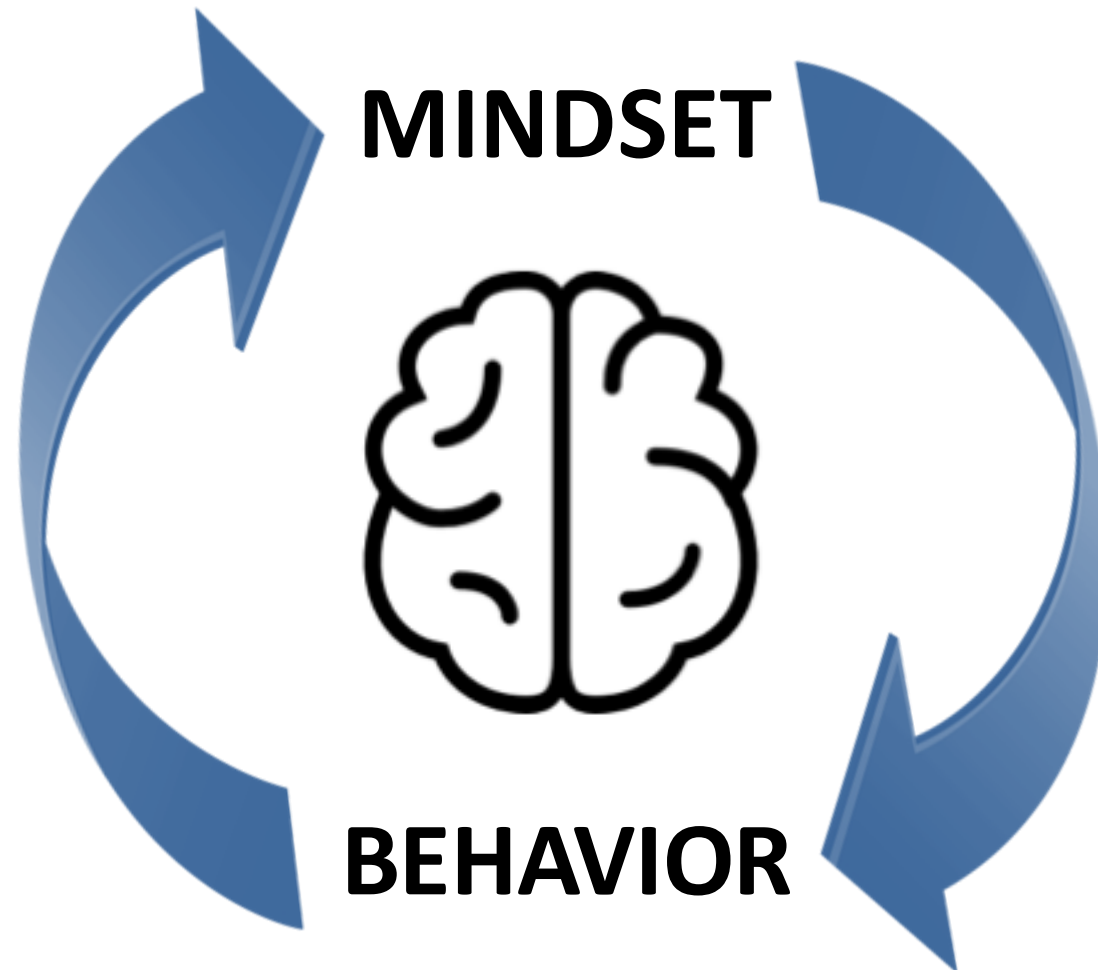
Awkward
Slow
Unnatural
Stiff
Uncomfortable
Difficult
It feels wrong
Had to think about it



**What's
going on
here?**

OUR THINKING PATTERNS ARE IN A LOOP

We've practiced folding our arms for decades

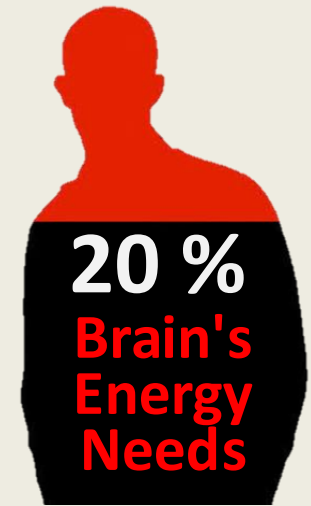


Every time you think or do something, you are more likely to do it again, **because it writes & strengthens neural pathways**

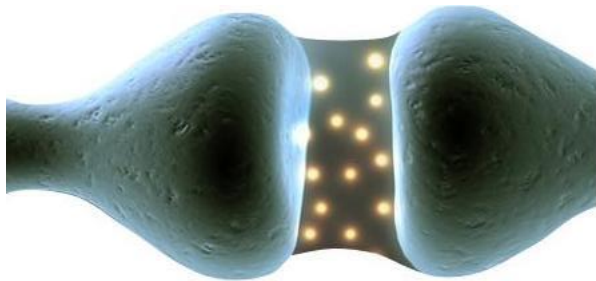


WHY THE 2nd TIME FEELS DIFFERENT

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

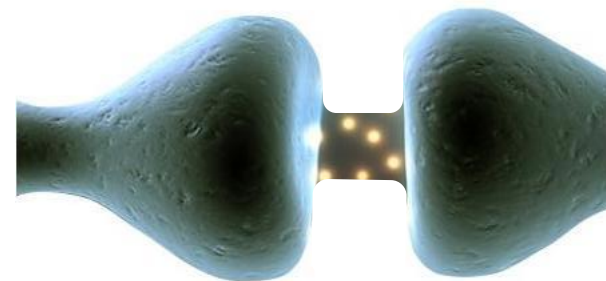


Fast & Efficient Neural Pathways
Our Habits



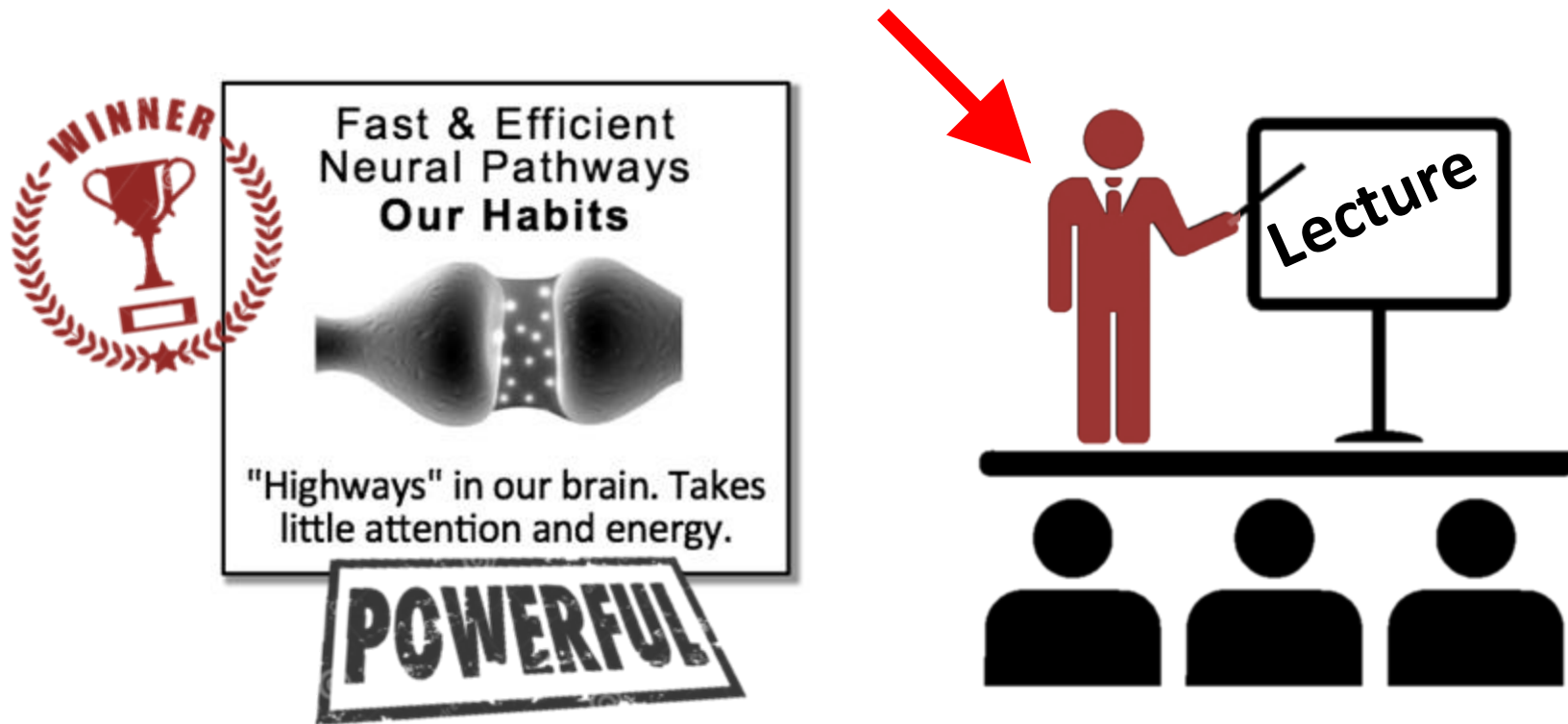
"Highways" in our brain. Takes little attention and energy.

Slow and Inefficient Neural Pathways
New Ways



Takes more attention and energy, at first

YOU CAN'T WIN THIS WAY

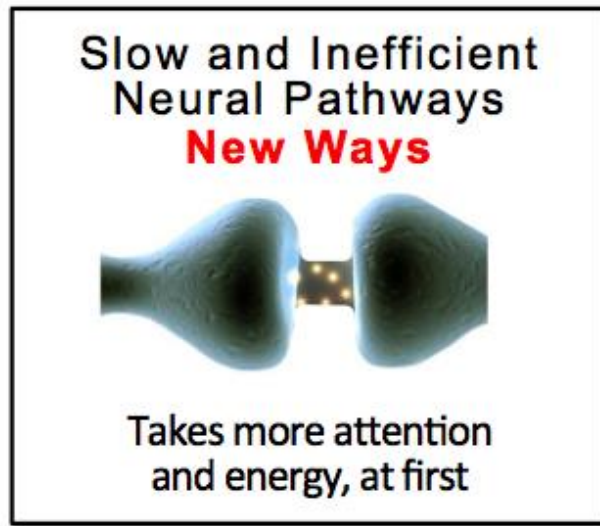


Trying to fight existing neural highways usually doesn't work.

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



What can work: Deliberately practicing a new routine.

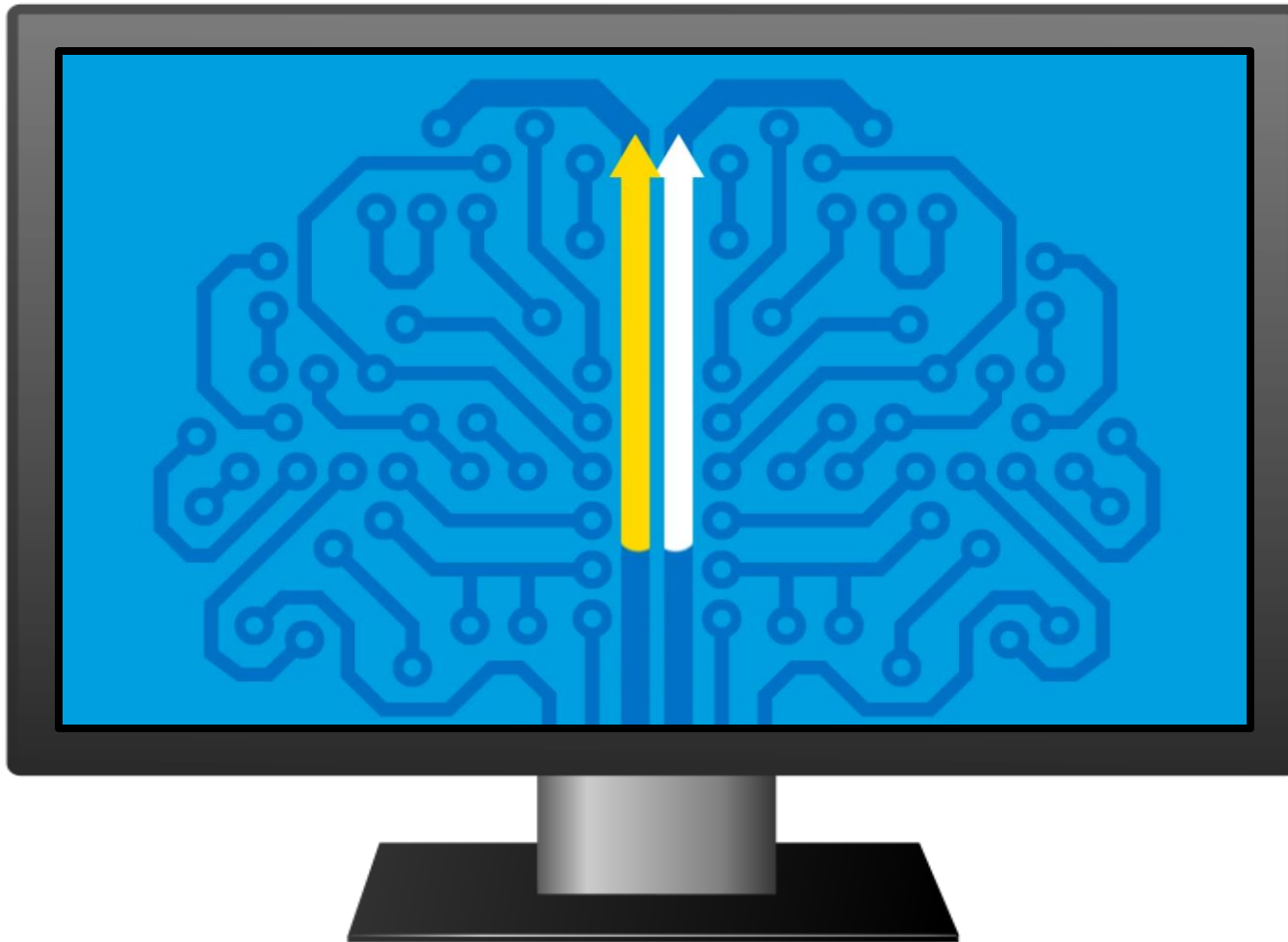
Focus on developing new neural pathways, i.e. building new habits.

← Grow new thinking, that eventually replaces the old

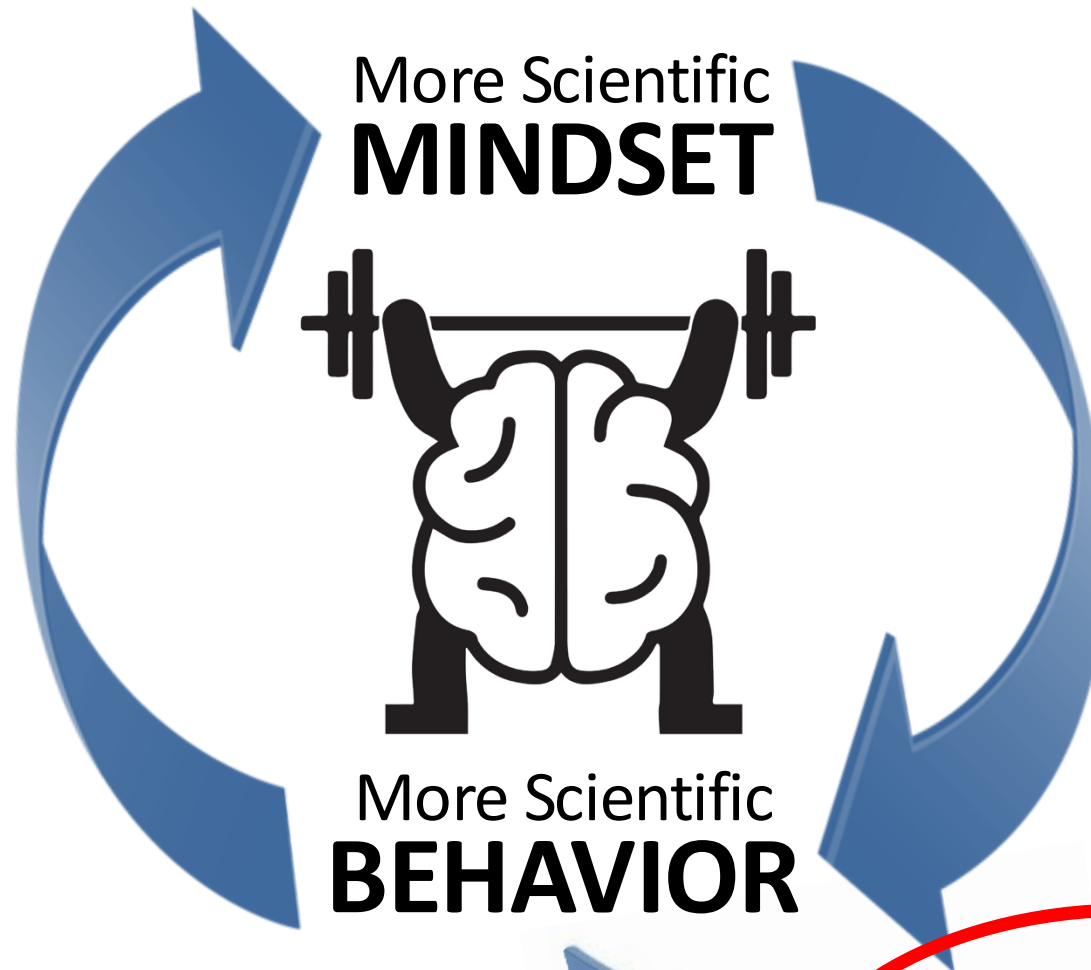
HOW WE ACQUIRE NEW SKILLS & MINDSET



(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**.

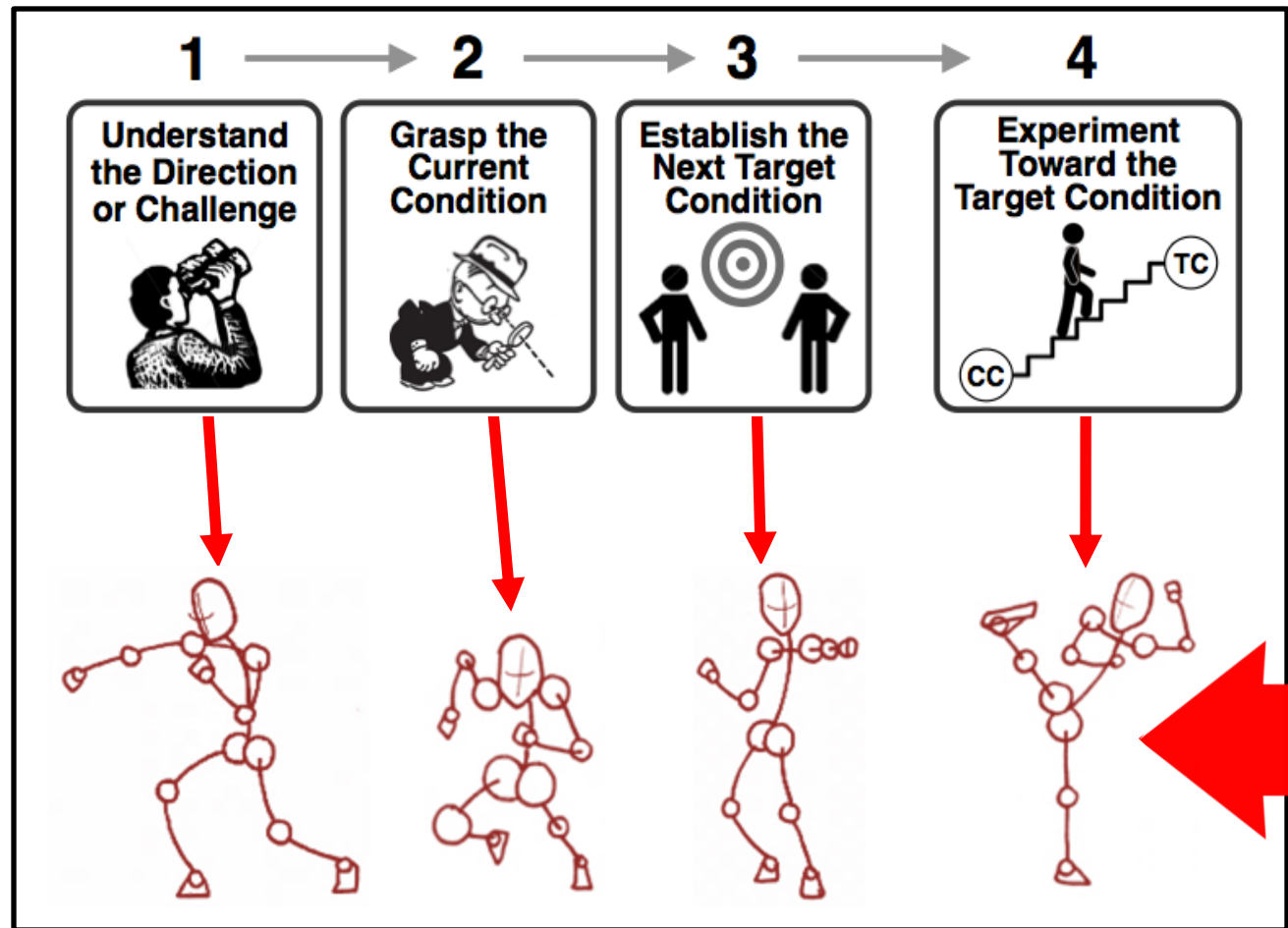


**STARTER
KATA**

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.

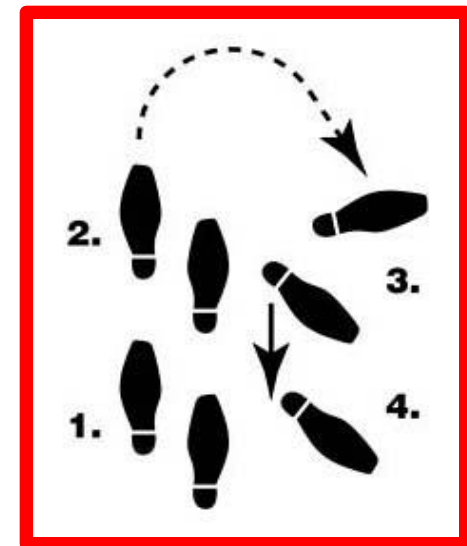
The IK Model



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)



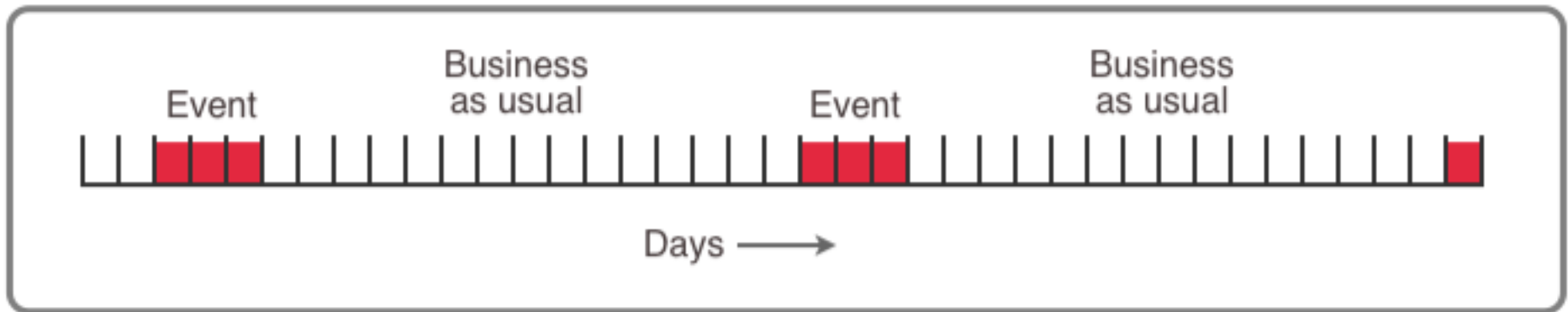
THERE'S ALSO A **COACHING KATA**

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



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.

OH!!!

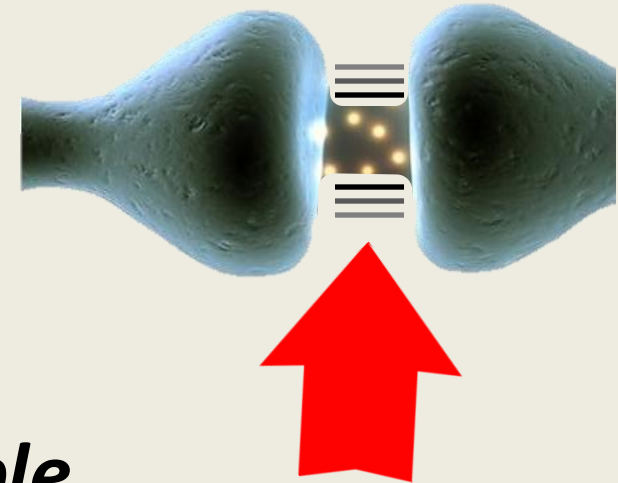
THIS IS WHAT YOU WANT TO FEEL

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 Definition

Obstacles Parking Lot

LEARNER

COACH

Block Diagram

Run Charts

Daily Coaching Cycle

≤ 20 Minutes a Day

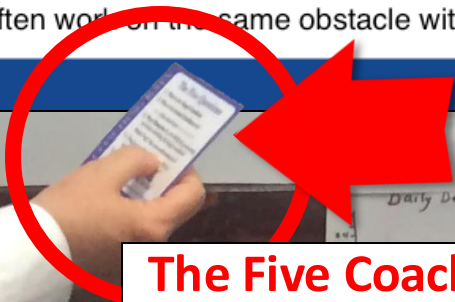
The Five Questions

- 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

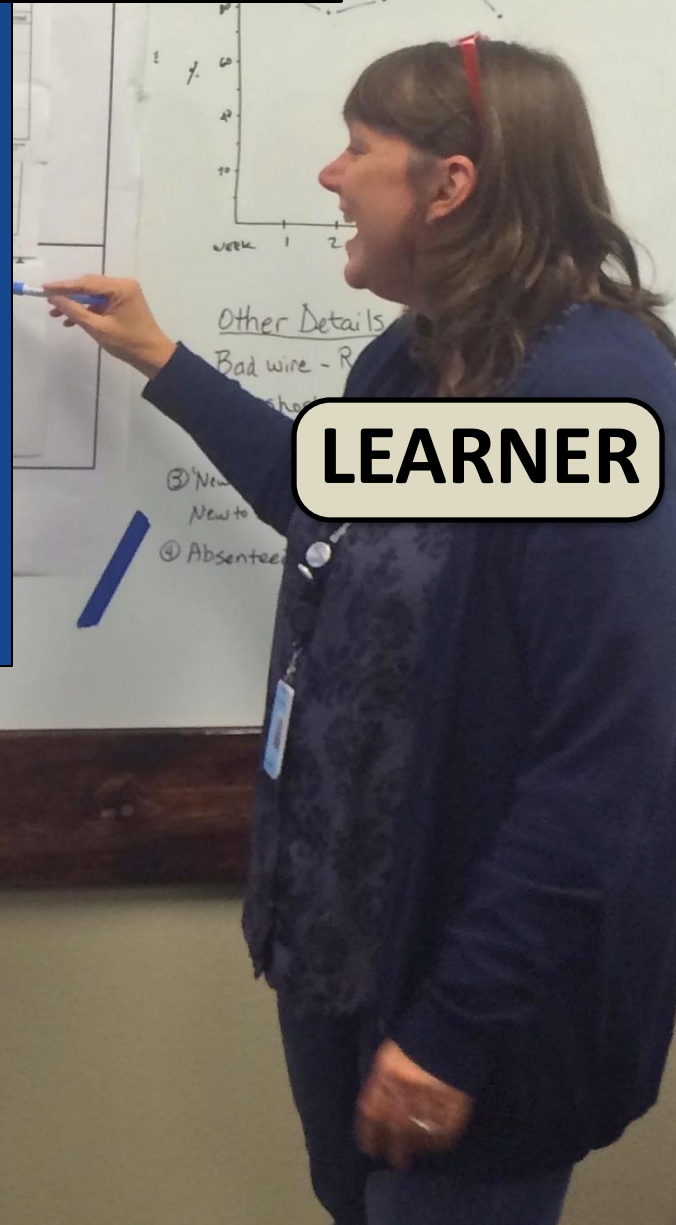
LEARNER

COACH



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

The Starter-Kata Coaching Questions

COACHING KATA	1) What is the Target Condition?
	2) What is the Actual Condition now?
	REFLECTION
	What did you plan as your Last Step?
	What did you Expect?
	What Actually Happened?
	What did you Learn?
	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?	

Coach's notes & clarifying questions

<ul style="list-style-type: none"> • Is the target condition connected to the challenge? • What do you want to be happening? • No verbs! • Measurable? • Not 'lack of something' • Achieve-by date?
<ul style="list-style-type: none"> • Numbers, not opinions. • Can you show me? • How do you know? • How did you get the data? • Is there a run chart?
<ul style="list-style-type: none"> • What was being tested? • Is the Experimenting Record filled in?
<ul style="list-style-type: none"> • Was this written down? • Just read it!
<ul style="list-style-type: none"> • Only facts & numbers. • Are the numbers written down? • Is there a run chart? • What is different than expected?
<ul style="list-style-type: none"> • Did the Learner really reflect on this?
<ul style="list-style-type: none"> • Is the Obstacles Parking Lot up-to-date? • True obstacles (variation), not action items or lack of a perceived solution.
<ul style="list-style-type: none"> • Where does this problem occur? • Can you show me? • When does this problem occur?
<ul style="list-style-type: none"> • What is the current knowledge threshold? • Did what was learned in the last experiment frame this one?
<ul style="list-style-type: none"> • Is expectation written down? • Please read it. • What numerical outcome do you expect? • How will you measure it? • How many cycles do you plan to measure?
<ul style="list-style-type: none"> • Strive for cheap and fast experiments • Can we run this experiment today? Right now? • When is the next coaching cycle? • Accompany the Learner.



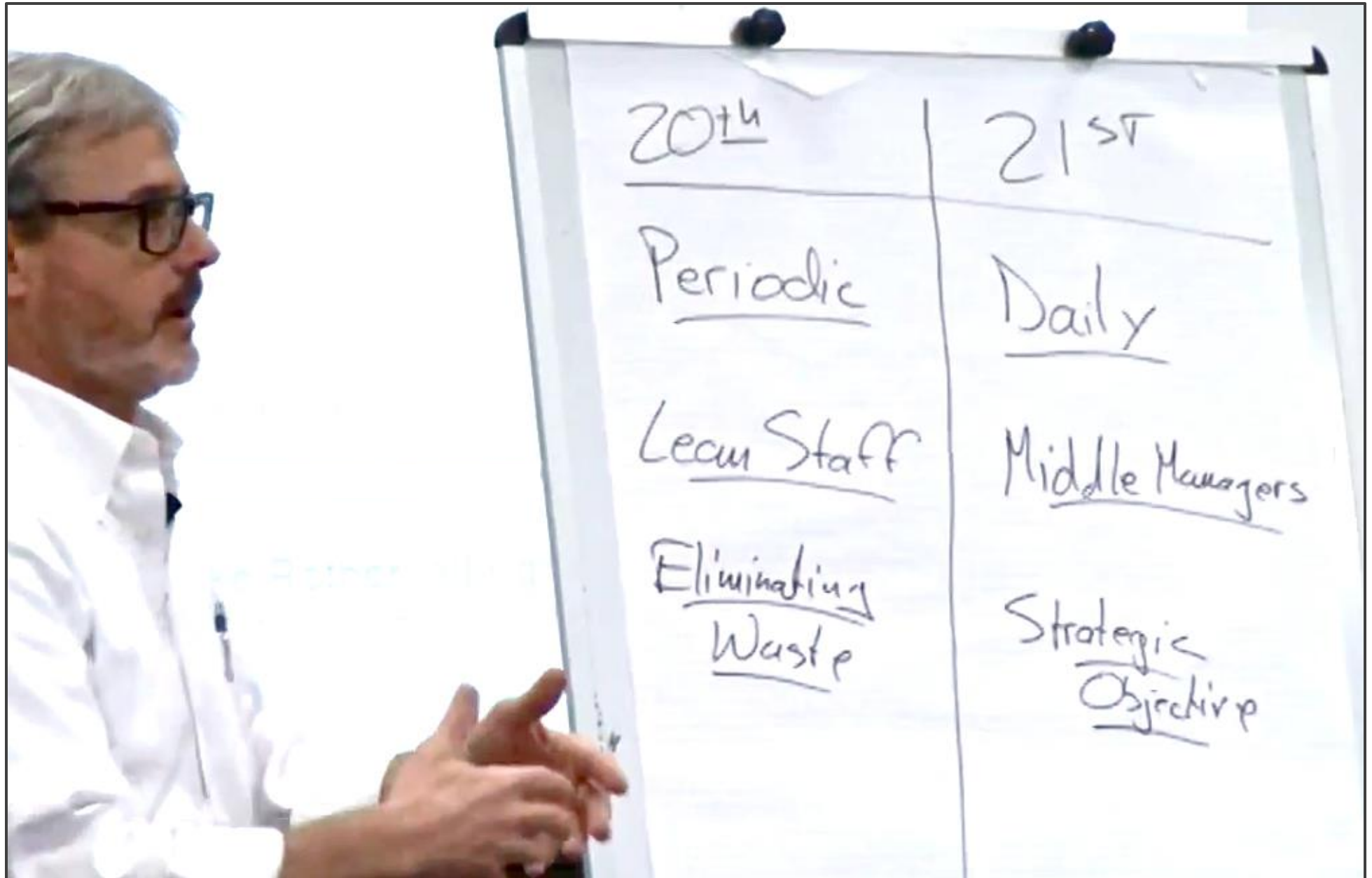
Starter Kata

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*

	1. Improvement Kata	2. Coaching Kata	3. Kata Creates Culture	4. Neuroscience	5. Getting Started	6. Challenge	in Share Tweet Follow
	Materials to Download	Video Tools	Links and Reading List	Value Stream Mapping	Extras	What is a Kata?	

How to Develop Scientific Thinking for Everyone, by Practicing Kata

Welcome to the TK website. My name is Mike Rother. The practice routines of the Improvement Kata and Coaching Kata will make you, your team and your organization better at improving, adapting, innovating and achieving whatever you set out to do.

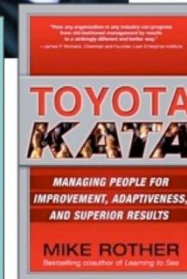
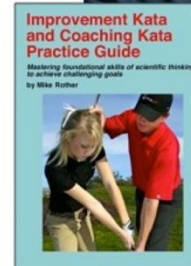
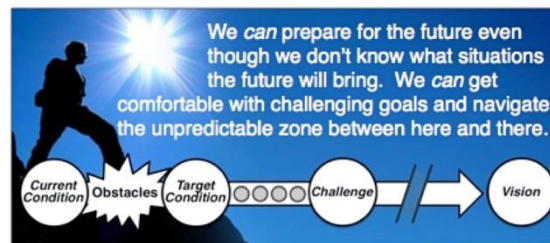
It's about practical application of Scientific Thinking for:

- Pursuing challenging goals.
- Enabling teams to make decisions more autonomously and maneuver situationally.

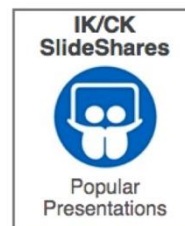
The Improvement Kata & Coaching Kata turn scientific thinking into a practical skill anyone can learn, by combining a four-step scientific working pattern with techniques of deliberate practice.



© Myra Klarman Photography

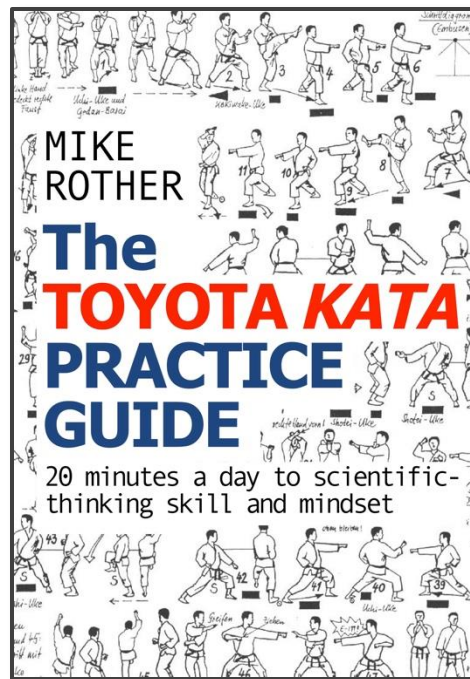
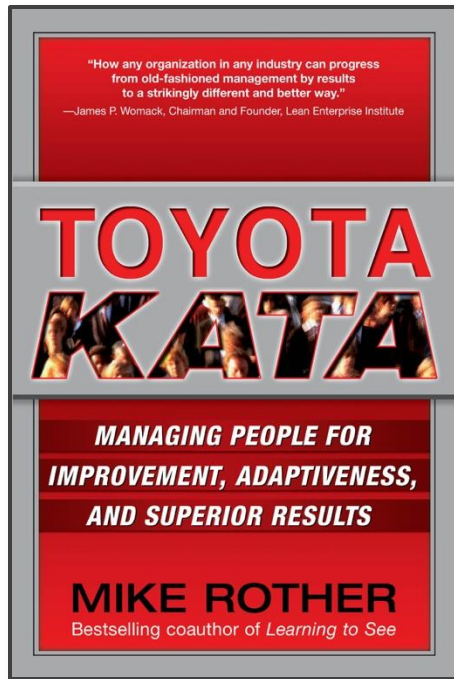


Share this link with teachers! ^
The materials are free.

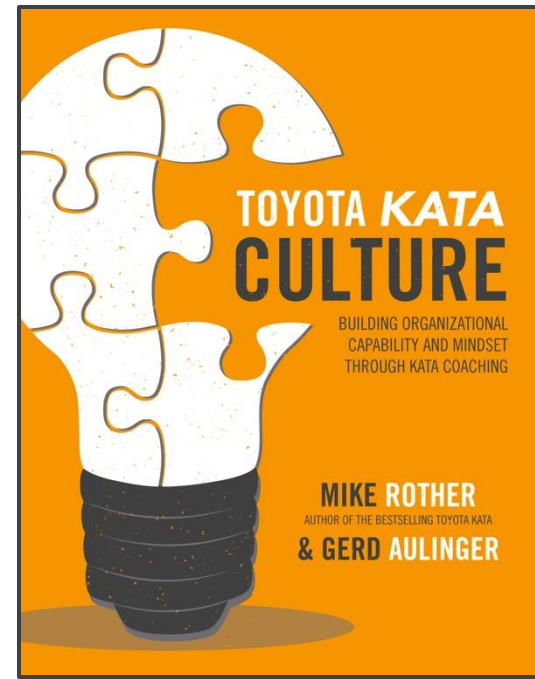


AFTER TODAY

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



NEW

The Online **Improvement Kata & Coaching Kata** Basics Course

166 minutes of Improvement Kata and Coaching Kata lessons

3 world class instructors...
Mike Rother, Jeff Liker, and Jim Franz

12 lessons

7 quizzes to gauge comprehension

Your Course Instructors

Jeff Liker Jim Franz Mike Rother

[Enroll in Course for \\$80](#)

AFTER TODAY

Kata in the Classroom
www.katatalogrow.com



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





***Best wishes
for your practice!***



