Learning by doing!

„Folding Paper Airplanes Incredibly Fast"
Coaching-Kata Exercise

**Gerardo Aulinger**

Just do it! Kata Coaching Excercise Paper Airplane, Gerardo Aulinger

The Kata are like a Trojan horse, a means to develop scientific working and thinking habits for everyone

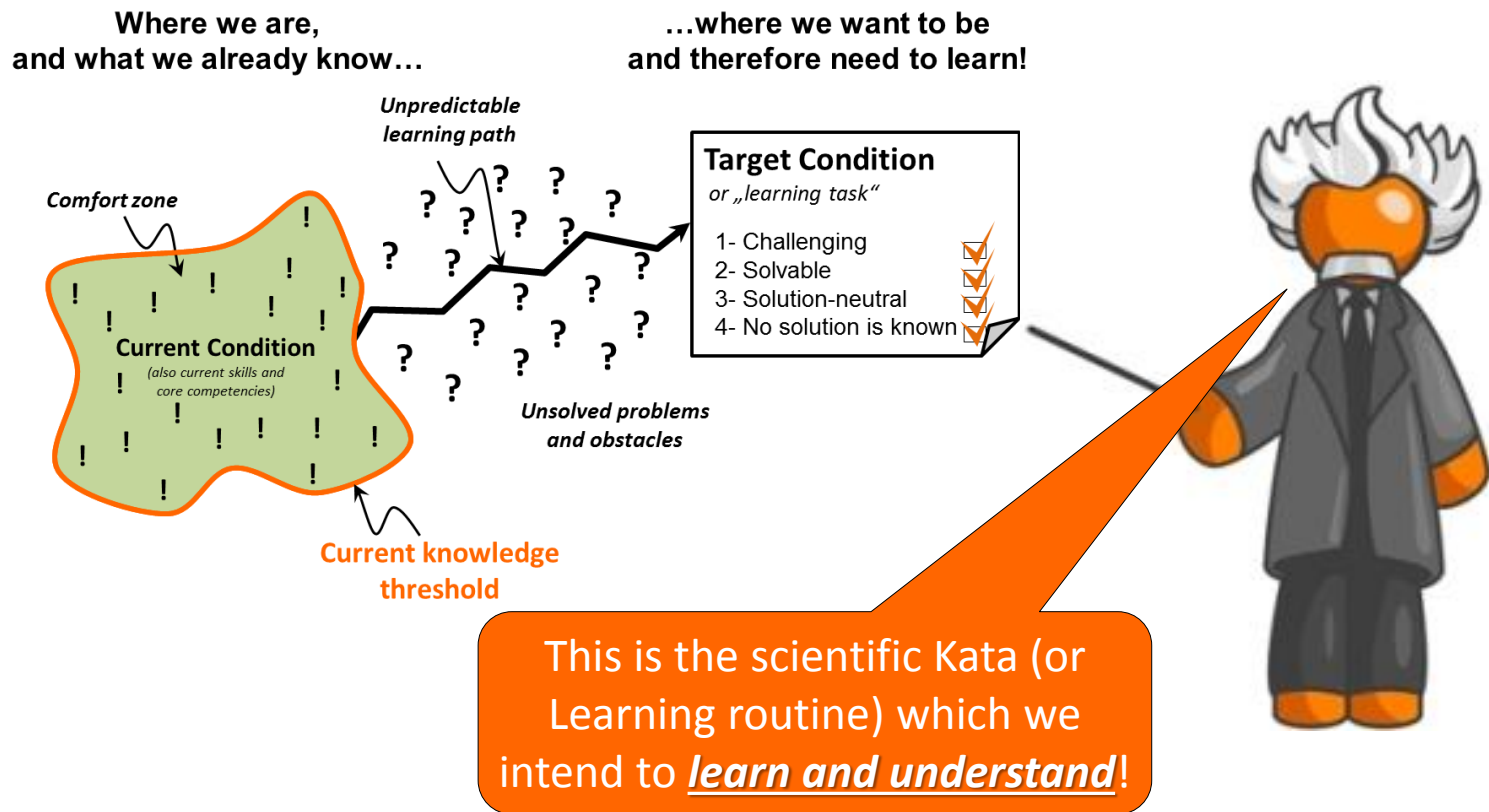scientific method inside

TOYOTA KATA

scientific method inside
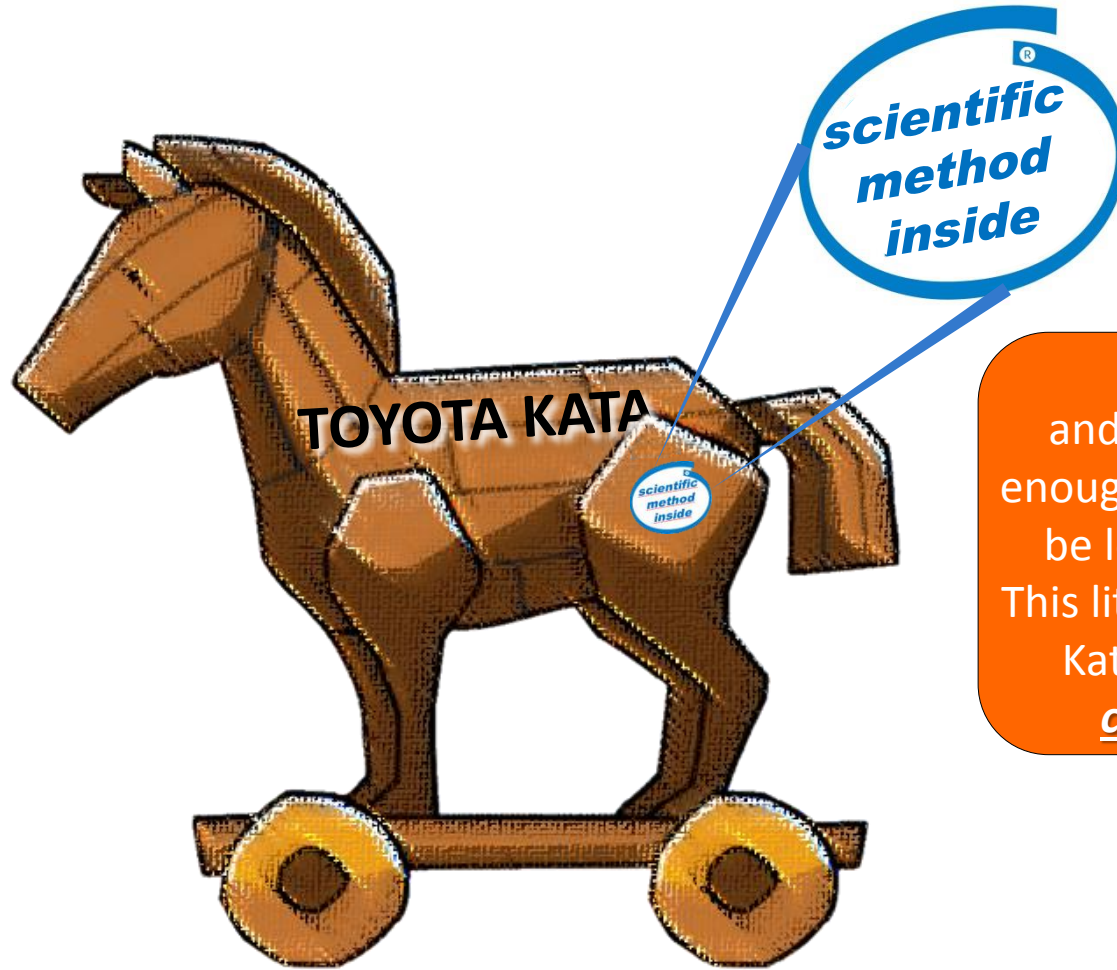
Targeted, scientific thinking and acting are skill that are not tought enough in our schooling system and should be learned and practiced by *everyone*! This little exercise is intended for you to try Kata at business and home with your *colleagues*, *children* and *friends*!
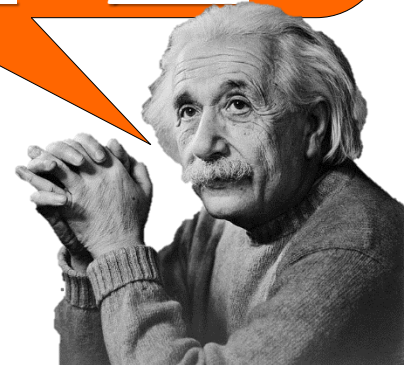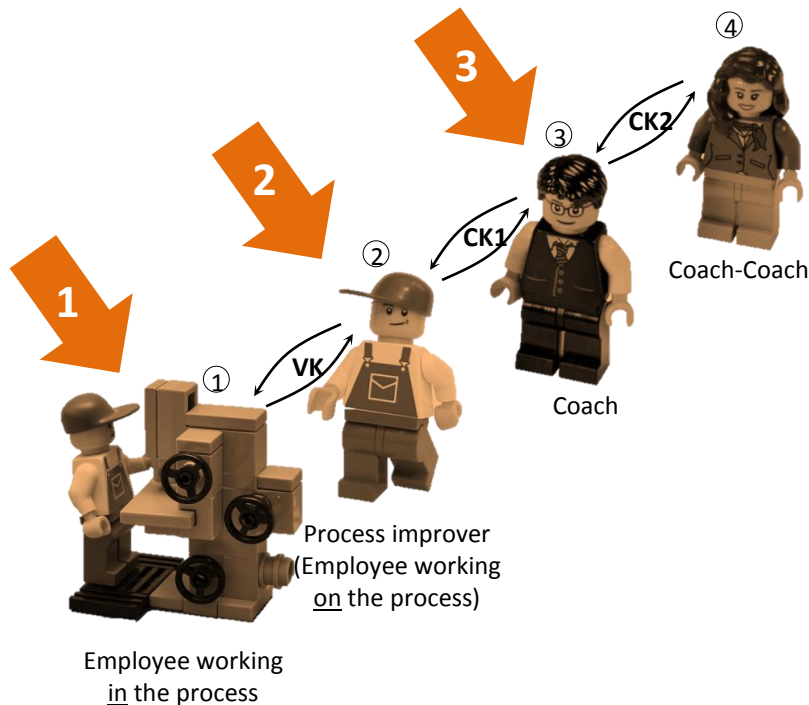
Why do we need an exercise? Because Kata are difficult to explain, but easy to understand by „experiencing"!

The Improvement Kata:

Where we are,
and what we already know…

…where we want to be
and therefore need to learn!

Unpredictable
learning path

Comfort zone

Target Condition
or „learning task"

1- Challenging
2- Solvable
3- Solution-neutral
4- No solution is known

Current Condition
*(also current skills and
core competencies)*

Unsolved problems
and obstacles

Current knowledge
threshold

This is the scientific Kata (or Learning routine) which we intend to *learn and understand*!

We want to better understand 3 of the 4 Roles of the Coaching Cascade: form groups of 3 persons with 1 person per role

3

2

1

VK

CK1

CK2

④ Coach-Coach

③ Coach

② Process improver
(Employee working
on the process)

① Employee working
in the process

① **Employee in the process:** *Am I able to work according to standard?*
Works cyclically, according to standard. His task is it to try to achieve the required performance in a given time and quality. As he is working productively, he has no time left for improvement. Nevertheless he is responsible for signaling problems immediately, and relay them to the process-improver as detailed as possible.

② **Process-Improver:** *Is the (production-)process running according to plan?* *(often „Hancho", „Mentee" or „process owner ") Observes the process and is looking for deviations from the standard.* Reacts to disturbances and fault reports coming out of the process. Develops process and standard according to the Improvement- Kata and performs experiments according to PDCA. Finds and produces solutions in dialogue with the employee and the coach

③ **Coach:** *Is the improvement process running according to plan?* *(often „Master" or „Mentor ")*
Ensures that the Mentee is working scientifically and experientially according to the Improvement-Kata, maintaining and practicing the routine. The development of the Mentee, and not the development of the process is his main focus. He regularly asks the 5 questions of the Coaching-Kata. He does not deliver nor suggest any solutions. He is responsible for setting targets and ensuring that they can be reached.

④ **Coach-Coach:** *Is the coaching process running according to plan?*
Ensures that the Coachings are taking place regularly, structured and target oriented – according to Coaching – Kata. Makes sure that conditions – time, organization structure, etc.- enables that.

Our factory has received an order to produce **210,000 paper airplanes per year**. We will need the **Kata to master this Challenge!**

This really sounds **_very_** challenging! I have no clue how we can achieve this!
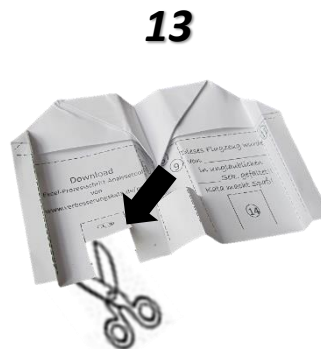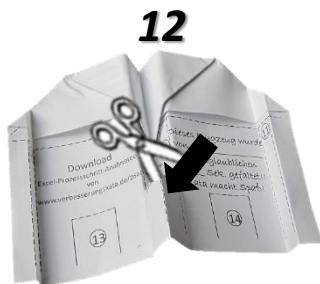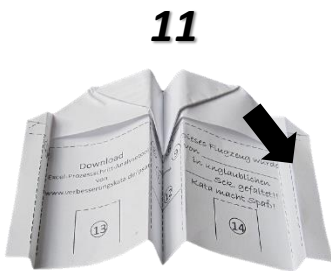
Our target: 1 airplane in 30 Sek*
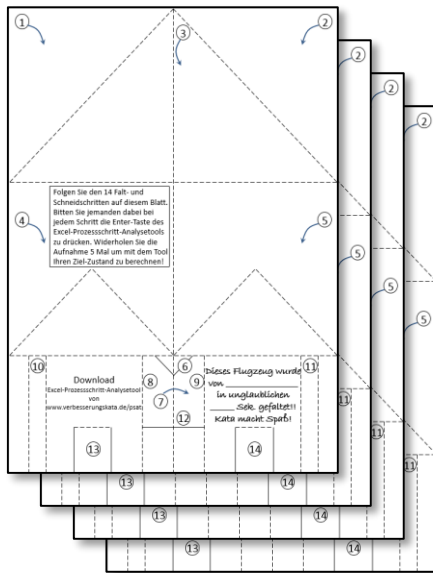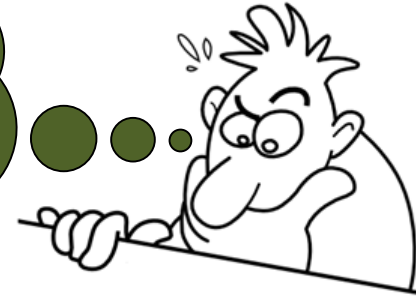
Our raw materials
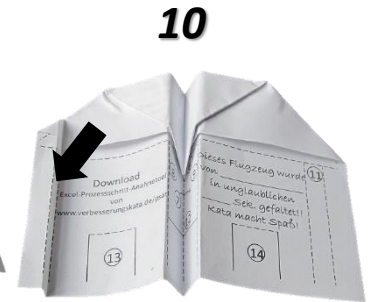
Our finished paper airplanes

*210.000 Stk, 240 working days per year, 1 shift per day, 440 min net working time per day

Assembly Instructions **in 15 Steps**

Steps correspond Excel Process Steps Analysis Tool. Printed paper should not be pre-folded nor pre-cut.

15 Take off!
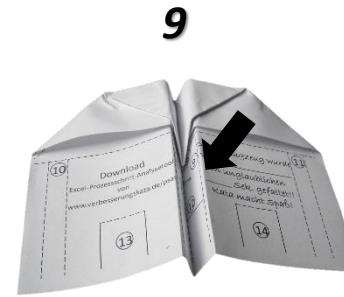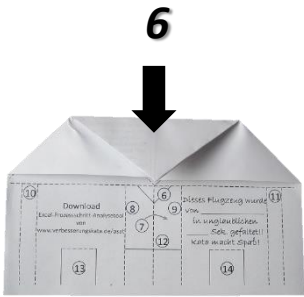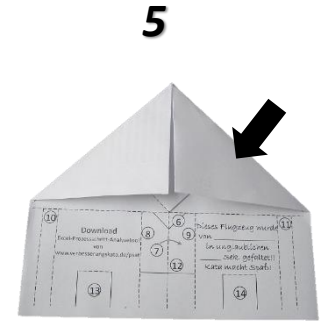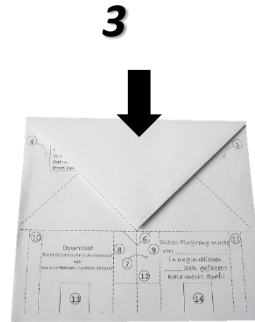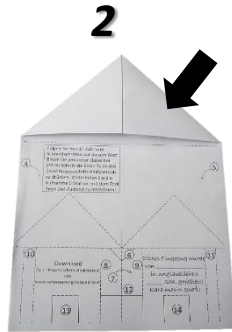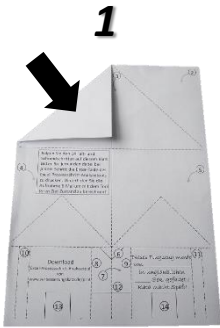
Demonstrate flight stability by 4 meter long flight!

The game lasts aprox. 2 hs: as soon as the Target-Condition is clear, we start Coaching and Experimenting towards it

1- Planning Phase

Introduction, Process Analisis, Target-Definition

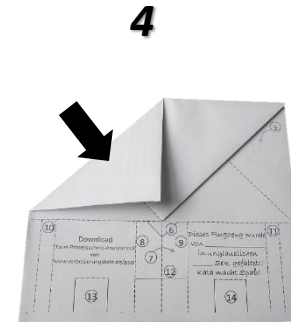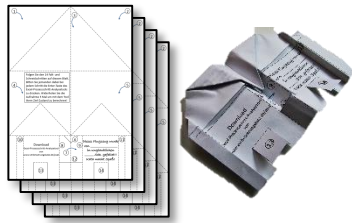Understand the Current Condition, aprox. 20 Min
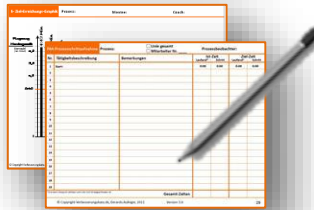
Define the Target Condition, aprox. 20 Min

2- Executing Phase

Iterate towards Target Condition

Coaching Cycles, 3-5 min each

Testing Hypothesis, aprox. 5 Min
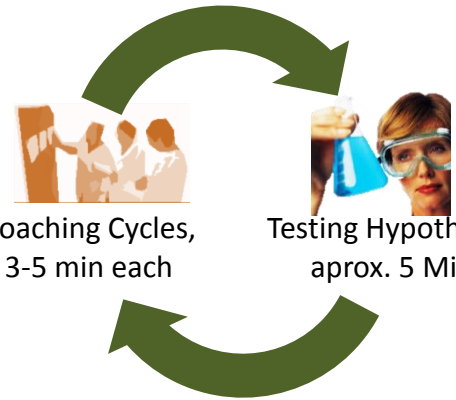
These are the Materials you need for each group

1 Laptop with Excel Process Step Analysis Tool
(Download: www.verbesserungskata.de/psat)

One scissor, one pencil, one eraser per group
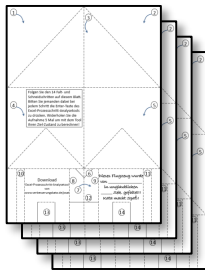
30x printout paper airplane per group
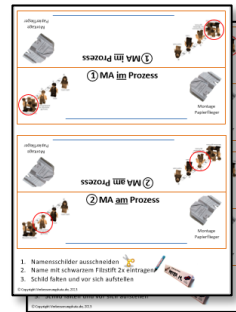
2x name tags per group
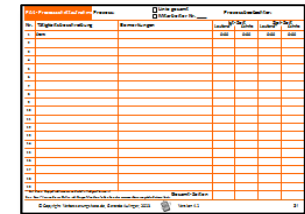
1x Process Steps Analysis Form
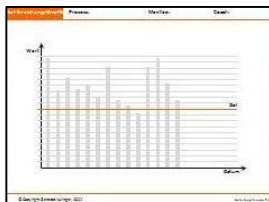
1x Target Achievement Form per group
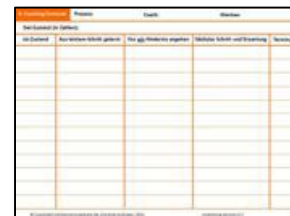
2x Coaching Forms per group

3x Coaching-Kata per group

Set up the **table** like this…

① *„Assembly operator" or „Employee in process*

② *„Learner" or „Process improver"*

Name tag

Laptop with Excel-Process Step Analysis Tool on table

Assemby space on table

Assembly instructions and airplane print outs
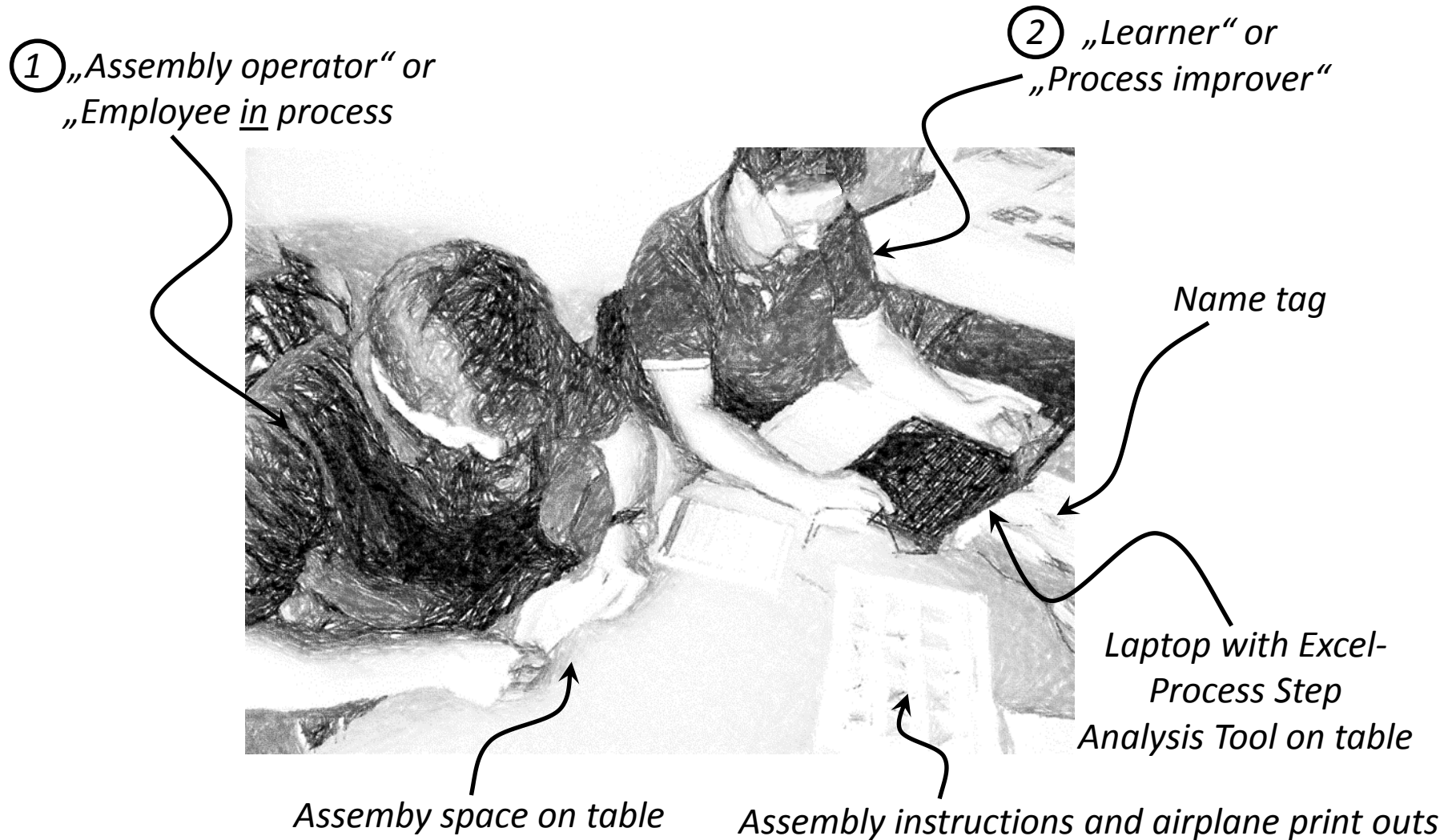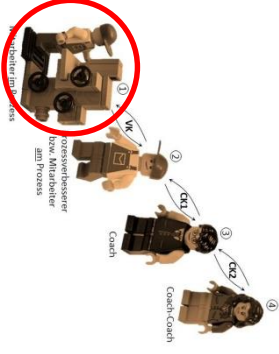
① Employee in process
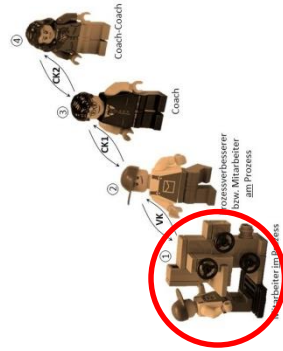
Assembly Paper Plane

② Process improver
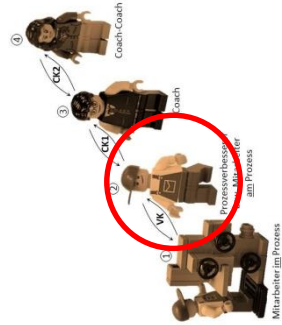
Assembly Paper Plane

1. Cut out name tags
2. Complete your name using a black marker
3. Fold name tag and place it in front of you

Assembly
Paper Plane

① Coach
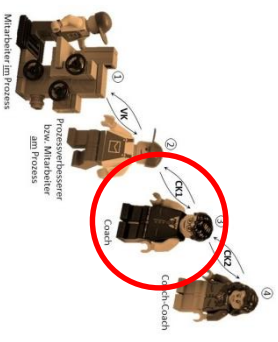
① Coach
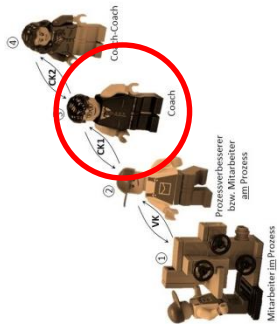
Assembly
Paper Plane

1. Cut out name tags
2. Complete your name using a black marker
3. Fold name tag and place it in front of you

Preparing the Kata Coaching Excercise

1- Divide participants in groups of 3 per table: who will have wich of the 3 roles?

2- Fill out and fold name tags, place on table

3- Employee in process: get familiarized with the assembly of the airplane

- fold aprox. 2 planes, understand the assembly sequence, speed is irrelevant at this point

4- Process improver: get familiarized with Excel-Process-Step-Analysis-Tool

- Read instructions sheet (2nd sheet on Excel Tool)
- write step numbers 1 to 15 in column „Process step"
- Complete the processes name in the white field top right
- With button Activate (delete everything) activate stopwatch
- Use ENTER to test tool and practice some time stopping

5- Repeat assembly processes five times, time each repetition with the Excel-Tool:

- Employee in process says „Start" and after every single step „one ready!", „two ready!" etc.
- Don't forget to save your times on your computer!
- Do not improve the process during the 5 cycles

6- Current Condition with PA4-Sheet: Copy TC from green column to PA4, use a pencil
Copy values from Target columns „step" and „running" from Excel-Tool with pencil
to the left to columns of the PA4-sheet

Fill out these 4 columns!

PA4
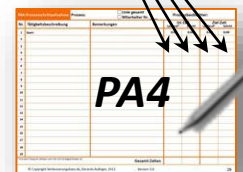
7- Total Target Assembly Time in PA4: defining a *challenging Target Condition* is
very important for your learning success. A target of 30 seconds is recomended,
write this value at the bottom of the Target Column of the PA4-Form

8- Correct Target Step Times with Excel Tool: press the green button AUTO ,
write „30 secs" when asked. Copy the automatically calculated numbers to column 3, 4.

9- Prepare coaching boards (one pinboard per group):

- pin PA4 left, note target on Form 5 and draw 5 columns with the 5 times you stopped

The Coaching Board is ready! The Coaching Cycles can begin!
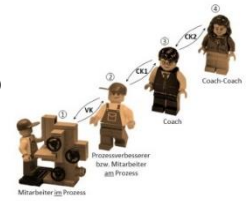
Instructions Prozess Steps Analysis Tool 4.5

With these three buttons you can optimize the size of the sheet on your computer display.

The stopwatch must be ACTIVE in order to be able to stop your step and cycle times.

The stopwatch must be INACTIVE in order to edit text areas.

Here you can complete the name of your process.

Here you can see it the watch is running and the time ellapsed.

With the AUTO function you can automatically calculate the needed step times necessary to achieve your target time.

Target-times can be corrected by hand to define the target condition to achieve.

Processes can be broken down to as many as 150 single steps.

The length of the sheet can be adjusted anytime just by clicking these buttons.

The 5 time-takings consist of cumulated, step and total times.

The shortest step time is marked in orange…

…and taken over as Target-Step-Time. That's why the Total Target Time is alwas shorter than the 5 times taken.

| Reduce, expand screen |
| Zoom +1% |
| Zoom -1% |

Process-Step-Analysis-Tool
Copyright 2013 Verbesserungskata.de, V 4.3

| Activate stopwatch (delete all) |
| Activate stopwatch (no delete) |
| Deactivate stopwatch (no delete) |

Process: *Gear assembly* **00:43,9**

Status: Stopwatch is ACTIVE! Text sections CAN NOT be edited now.

Date of time recording: 11.7.13 13:25

| Nr | Process step | Adjust sheet length to 3 free rows | to 150 rows | Current condition (max. 5 time-takes) | | | | | | | | | | | Target cond | | AUTO |
|----|--------------|---|---|----------|------|----------|------|----------|------|----------|------|----------|------|----------|------|------------|
| | | | | Cumulated | Step | Cumulated | Step | Cumulated | Step | Cumulated | Step | Cumulated | Step | Cumulated | Step | Correction |
| 0 | Take bolt | | | 00:00,0 | 00:00,0 | 00:00,0 | 00:00,0 | 00:00,0 | 00:00,0 | 00:00,0 | 00:00,0 | 00:00,0 | 00:00,0 | 00:00,0 | 00:00,0 | 00:00,0 |
| 1 | Place bolt in hole | | | 00:05,5 | 00:05,5 | 00:04,5 | 00:04,5 | 00:00,9 | 00:00,9 | | | | | 00:00,9 | 00:00,9 | |
| 2 | Assemble lid | | | 00:08,6 | 00:03,1 | 00:09,0 | 00:04,5 | 00:05,3 | 00:04,5 | | | | | 00:03,9 | 00:03,1 | |
| 3 | Screw tight | | | 00:13,3 | 00:04,7 | 00:13,6 | 00:04,5 | 00:12,1 | 00:06,8 | | | | | 00:08,5 | 00:04,5 | |
| 4 | Place second bolt | | | 00:16,7 | 00:03,4 | 00:18,4 | 00:04,9 | 00:15,6 | 00:03,4 | | | | | 00:11,8 | 00:03,4 | |
| 5 | Screw tight | | | 00:20,5 | 00:03,8 | 00:23,3 | 00:04,9 | 00:17,6 | 00:02,0 | | | | | 00:13,9 | 00:02,0 | |
| 6 | Fold box | | | 00:23,8 | 00:03,4 | 00:27,6 | 00:04,3 | 00:21,8 | 00:04,2 | | | | | 00:17,2 | 00:03,4 | |
| 7 | Place gear in box | | | 00:26,9 | 00:03,1 | 00:30,8 | 00:03,2 | 00:24,6 | 00:02,7 | | | | | 00:20,0 | 00:02,7 | |
| 8 | Stick ticket on box | | | 00:28,2 | 00:01,3 | 00:34,0 | 00:03,2 | 00:27,7 | 00:03,2 | | | | | 00:21,3 | 00:01, | |
| 9 | Place box on palette | | | 00:29,8 | 00:01,6 | 00:34,6 | 00:00,6 | 00:30,4 | 00:02,6 | | | | | 00:21,9 | 00:00,6 | |
| 10 | Return to bench | | | 00:31,5 | 00:01,7 | 00:37,7 | 00:03,2 | 00:34,0 | 00:01,6 | | | | | 00:23,6 | 00:01,7 | |
| 11 | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | | |

11 Process steps defined (minimum 2, maximum 150)

Total times: **00:31,5** **00:37,7** **00:34,0** 00:00,0 00:00,0

Process: **Learner:** **Coach:**

pencil

Airplane
Assembly time

Process indicator
(incl. unit)

3,0

2,0

1,0

0:30

0

4:42 Min

3:41 Min

4:17 Min

3:33Min

3:57Min

Attention!
Scaling above differs from scaling below!

Target= 0:30 Min

Datum

Set up the Coaching Board like this...

Filled out PA4-Form

Target Achievement form with 5 bars

Coaching Form

Only use pencil when Filling out forms

Coaching Kata Form or 5Q-Card
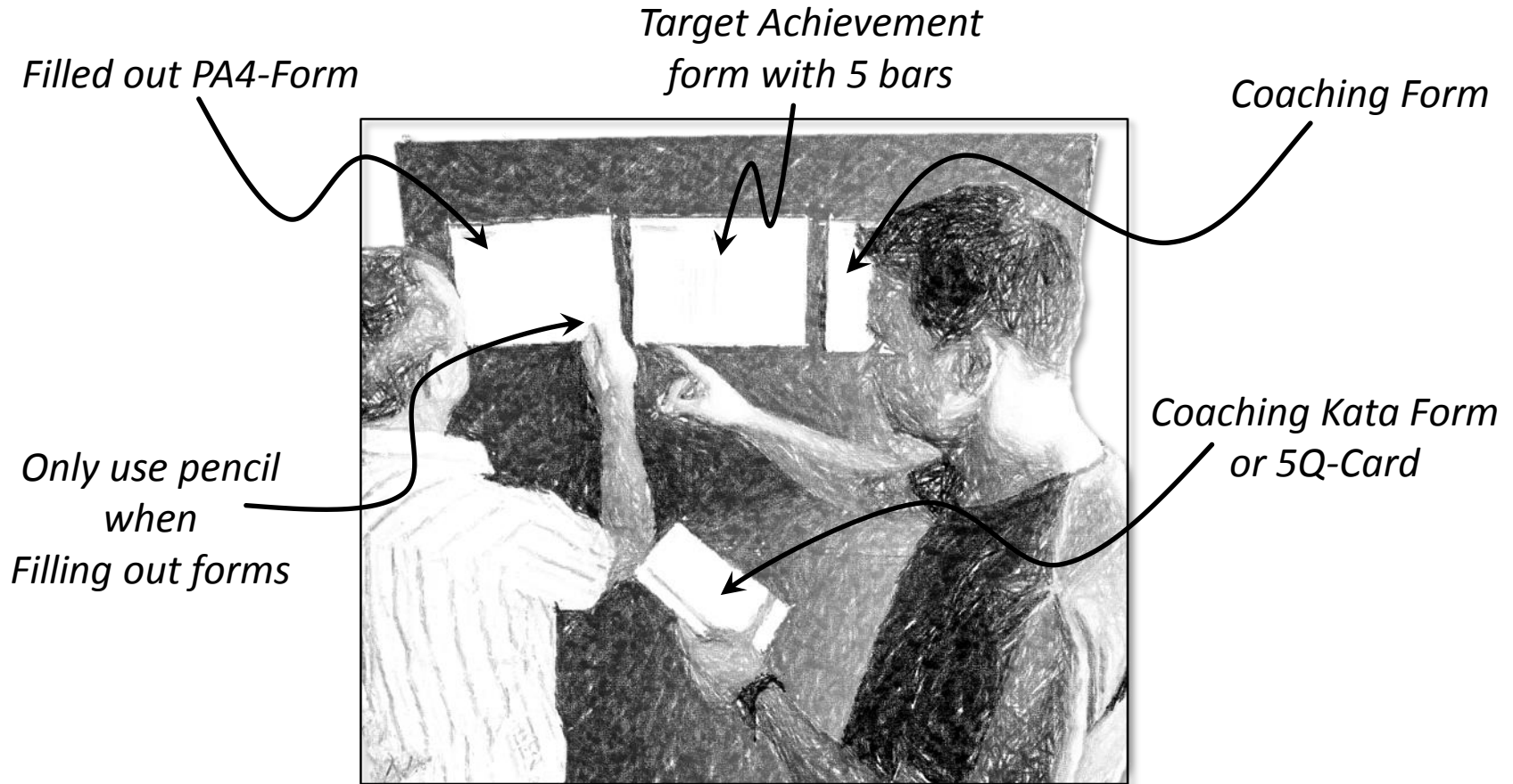
② „Learner" or „Process improver"
(Attention: we do not coach the ① assembly worker!)

③ „Coach"

COACHING KATA

The 5 Questions*

1 - What is the Target Condition of this process?

2 - What is the Current Condition now?

Go to the process, Turn Card to Reflect on the Last Step ⟶

3ₐ - What Obstacles do you think are preventing you from reaching the Target Condition?

3b - Which One Obstacle are you addressing now?

Turn Card to Detail the One Obstacle ⟶

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4 - What is therefore your Next Step and what do you expect to Learn from it?

Turn Card to Detail the Next Step ⟶

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5 - When can we go and see what you have Learned from taking that step?

* The 5 Questions on the front side of this Card and Question 2.1 on the rear side must be asked every time and always with the same wording as written here.

During the first Coaching Cycles just use these *__5 Questions__* on the left side of the Coaching Kata Sheet!

0.1- Hello [Name]! We had agreed on doing a Coaching Cycle now. Is it OK with you?

Reflec...

2.1- W... ...rn from it?
2.2- Wh...
2.3- An...
2.4- Wh...
2.5- Wh...
2.6- Is t... ...old me?

2.9- [Do... ...he board and)
wr... ...orget anything.

Be very specific when describing the ... to tackle next
A very detailed understanding of root ca... ...umerical, unwanted effects are crucial in order to describe a meaningfu... ...next step! Please do not jump to solutions in this phase!

3.1- What <u>exactly</u> is the problem with/...[mkw]? Can you show me, please?
3.2- Could we <u>simulate</u> the problem/...w] right here?
3.3- What should <u>rightly</u> happen (so t...t...[mkw] can be avoided)?
3.4- Where can I see... ...uld rightly happen (with…[mkw])?
3.5- What is <u>actu...</u> happening... ... [mkw]?
3.6- Why/How c...n this mistake/this problem happen/be done?
3.7- Why is...[mk... ...n?
3.8- What <u>exactly</u>... ...<u>not know</u> (about…[mkw])?
3.9- Which One Obst... ...are... <u>exactly</u> addressing now?

Be specific when ... ...ng the <u>Hypothesis und Experiment</u>
Because in our Ne... ...d always be testing refutable hypothesis!

4.1- Ho... ...n you show me, please?
4.2- How... ...t Step?
4.3- And ... ...om it?
4.4- How <u>exactly</u> w... ...your expected result?
4.5- How <u>exactly</u> w... ...your measurement(s)?

4.9- Thank you! P... ...n to the board and) write down what you have said so far, so... ...orget anything.

Always take ju... ...t a time

5.1- What of that ... ...d think you could do today/until…[propose time]?

mkw:= try to use the m... ...from the last answer he gave you in your next detailing question. He will appreciate that you are actively listening to him!

Blatt hier falten!

The 5 Questions*

COACHING KATA

1 - What is the Target Condition of this process?

2 - What is the Current Condition now?

Go to the process, Turn Card to Reflect on the Last Step ⟶

3a - What Obstacles do you think are preventing you from reaching the Target Condition?

3b - Which One Obstacle are you addressing now?

Turn Card to Detail the One Obstacle ⟶

4 - What is therefore your Next Step and what do you expect to Learn from it?

Turn Card to Detail the Next Step ⟶

5 - When can we go and see what you have Learned from taking that step?

* The 5 Questions on the front side of this Card and Question 2.1 on the rear side must be asked every time and always with the same wording as written here.

0.1- Hello [Name]! We had agreed on doing a Coaching Cycle now. Is it OK with you?

Reflect on the Learnings of the Last Step Taken

2.1- What did you Plan as your Last Step and what did you learn from it?
2.2- What did you Expect?
2.3- And what did you learn from it?/from taking that Last Step?
2.4- What actually happened?
2.5- What Value(s) have you measured?
2.6- Is there anything else you learned beyond what you already told me?

2.9- [Don't forget to praise!] Thank you! Please, let us (return to the board and) write down what we have learned so far, so that we do not forget anything.

Be very specific when describing the One Obstacle to tackle next
A very detailed understanding of root cause and it's numerical, unwanted effects are crucial in order to describe a meaningful, targeted next step! Please do not jump to solutions in this phase!

3.1- What exactly is the problem with/why…[mkw]? Can you show me, please?
3.2- Could we simulate the problem/…[mkw] right here?
3.3- What should rightly happen (so that…[mkw] can be avoided)?
3.4- Where can I see what should rightly happen (with…[mkw])?
3.5- What is actually happening (with… [mkw]?
3.6- Why/How can this mistake/this problem happen/be done?
3.7- Why is…[mkw] a problem?
3.8- What exactly is it that you do not know (about…[mkw])?
3.9- Which One Obstacle are you exactly addressing now?

Be specific when describing the Hypothesis und Experiment
Because in our Next Step we should always be testing refutable hypothesis!

4.1- How exactly will you…[mkw]? Can you show me, please?
4.2- How exactly will you take that Next Step?
4.3- And what do you expect to learn from it?
4.4- How exactly will you measure/test your expected result?
4.5- How exactly will you document your measurement(s)?

4.9- Thank you! Please, let us (return to the board and) write down what you have said so far, so that we do not forget anything.

Always take just One Step at a time

5.1- What of that next step do you think you could do today/until…[propose time]?

mkw:= try to use the mentee's key words from the last answer he gave you in your next detailing question. He will appreciate that you are actively listening to him!

Blatt hier falten!

Follow the 14 folding and tearing steps one by one, have someone press enter at the Excel-Process-Steps-Analysis-Tool.
Repeat 5 times to get your Target Condition calculated!
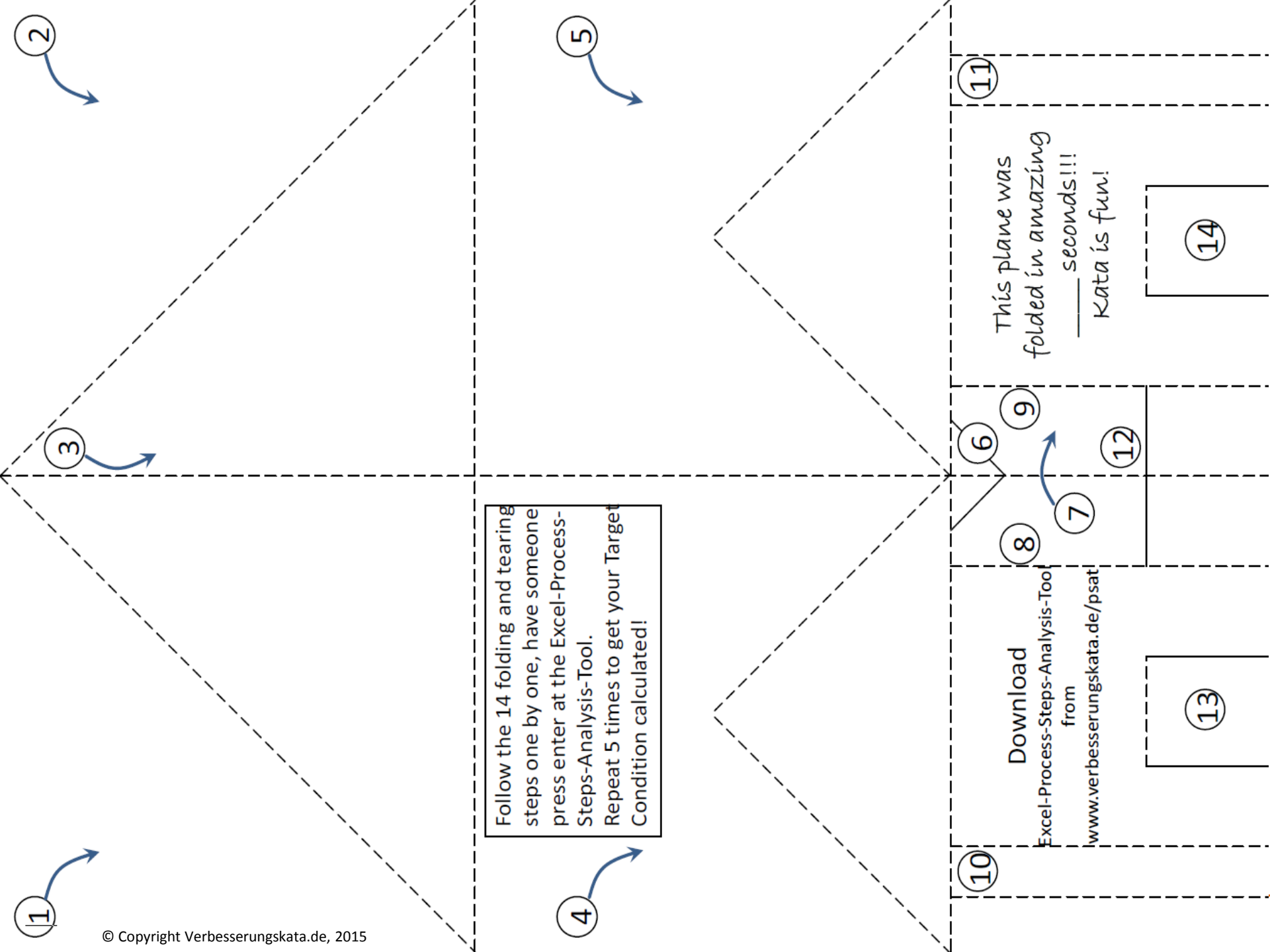
This plane was folded in amazing ——— seconds!!! Kata is fun!

Download Excel-Process-Steps-Analysis-Tool from www.verbesserungskata.de/psat

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Process indicator

Target =

0

Date

6- Coaching-Sheet	Process:		Coach:		Mentee:	

[1] Target-Condition (in numbers):
Output and Process Indicators

[2] Current condition	[2.3] Learned from last step?	[3.8] Only one obstacle at a time	[4.0] Next stept and what you expect	[5.0] Date/Place
Output and Process indicator	Was the last hypothesis refuted or confirmed?	Has root cause been described and quantified?	A refutable hypothesis with an expected, numerical effect	Synchronized with step?

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Version 6.0

PA4-Process-Steps-Analysis	Process:		Line Operator Nr. ____		Process improver:			
Nr.	**Process step description**	**Comments**		**Current-State**			**Target-Condition**	
				Running*	**Step**		**Running***	**Step**
1	Start:			0:00	0:00		0:00	0:00
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
		Total time:						