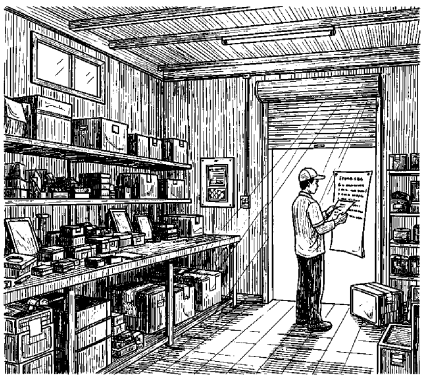
SPECIFIC-CASE

WORKSHEET 8 OF 9

One Cell Consistently Misses Takt While Others Wait

Scenario: weekly throughput data shows one work cell consistently completing fewer units per shift than takt time requires, while upstream cells finish early and wait. The problem has appeared in three consecutive weekly measurements. The cell supervisor reports the team is working at full effort.



Complementary worksheet for
Lean Operations Principles

SECTION 1

What This Is For

A nine-step diagnostic for identifying why one cell in an otherwise functional system is consistently late — when 'the team is working at full effort' is the only available explanation. Full effort and sufficient throughput are not the same thing. This worksheet separates what the cell is actually doing with its shift time from what it should be doing, by classifying every observed activity against the seven waste types and against the bottleneck cycle time.

Three consecutive weeks of the same measurement showing the same result means the cell is not experiencing a temporary disruption. It is experiencing a structural condition that will not self-correct. This worksheet runs the nine diagnostic steps required to name that condition specifically enough to fix it — distinguishing between a tool problem, a layout problem, a standard problem, and a coordination problem, each of which has a different resolution path.

SECTION 2

Benefits

What you get when you actually run this worksheet on a real situation:

- Produces a specific waste category finding from direct observation, replacing 'the team is overwhelmed' with a named, measurable cause.
- Identifies whether non-bottleneck work at the lagging cell is the cause of the gap — often the fastest resolution when the cycle time gap is under 15%.
- Checks whether the work standard is current and posted, catching the common case where the cell is working to an outdated method.
- Designs a specific post-resolution audit check, making the verification step as concrete as the diagnostic step.
- Creates a dated diagnostic record that distinguishes 'problem identified and addressed' from 'problem discussed and deferred.'

SECTION 3

Framework To Use

— Nine-Step Cell Diagnostic

Observe before classifying. Classify before calculating. Calculate before deciding. The sequence prevents treating symptoms.

1	1 — List all activities in one shift by direct observation (2 hours, not a report)
▼	
2	2 — Classify each activity: value-added / necessary non-VA / pure waste
▼	
3	3 — Calculate: what share of shift time is pure waste?
▼	
4	4 — Identify the dominant waste type from the seven categories
▼	
5	5 — Check: is any non-bottleneck work being done by this cell?
▼	
6	6 — Check: is the work standard current and posted in the area?
▼	
7	7 — Check: is the cell waiting for a tool, material, or information?
▼	
8	8 — Check: has staffing changed in the past 6 weeks?
▼	
9	9 — Calculate: gap between observed cycle time and takt time (in minutes)

SECTION 4

How To Use

Follow these steps in order. Each one builds on the previous.

1. Start by sitting in the lagging cell for two hours of direct observation. Do not alert the team that a diagnostic is being run. Write every activity you see, one line per activity.
2. After the observation, classify each activity from your list: value-added (customer would pay for it), necessary non-value-added (regulatory or technical requirement), or pure waste.
3. Calculate total shift time spent on pure waste activities as a percentage. If the answer is above 15%, the gap has an identifiable waste cause.
4. From the pure waste activities, identify which of the seven waste types dominates: waiting, motion, defects, overprocessing, transport, inventory, or overproduction.
5. List every activity the cell does that could be performed by a non-bottleneck cell or person. Estimate total minutes per shift.
6. Check: is the work standard still posted in the area and still current? If it has not been updated in the past six months and the process has changed, the cell may be working to a method that no longer fits the actual work.
7. Check: does the cell wait for a tool, material, approval, or information during normal operation? If yes, classify the waiting cause: personnel, information, or tool and space availability.
8. Check: has staffing changed in the past six weeks? A new employee, a departure, or a shift in assignment can change effective cycle time without changing nominal staffing count.
9. Calculate the gap: observed cycle time at this cell minus takt time. Express in minutes. Write the resolution path that matches the dominant waste type.

SECTION 5

Example Use

A five-person packaging line has three consecutive weeks showing the labeling cell completing 15% fewer packages per shift than takt time requires. Upstream sealing cell finishes 40 minutes early and waits. The labeling supervisor says the team is not slacking.

Two-hour observation, labeling cell, Tuesday morning.

Activities recorded: applying label to package (VA), positioning package on the conveyor (VA), walking to the far bench to collect new label rolls (pure waste — motion), waiting while the label printer warms up after running out of paper (pure waste — waiting for tool), reapplying labels that lifted during transit from sealing (pure waste — defects from upstream), checking with the sealing team what color batch is next (pure waste — information waiting).

Classification total: 41% of observed shift time in pure waste activities. Dominant waste type: motion (label roll walk) and waiting (printer warm-up, color batch information).

Non-bottleneck work at labeling cell: none identified.

Work standard: last updated 14 months ago. The current standard does not include a step for checking the incoming batch color because that step was added four months ago when a new product line launched. Employees developed an informal confirmation step with sealing, but it is not in the standard and is not consistent across operators.

Tool check: label printer is at the same bench as the label rolls. The warm-up wait (estimated 4 minutes per roll change, 3 changes per shift = 12 minutes per shift) is caused by the label rolls running to empty before a new roll is staged. No buffer roll is pre-loaded.

Staffing: unchanged for 11 months.

Cycle time at labeling: observed 5.8 minutes per package. Takt time: 5.0 minutes per package. Gap: 0.8 minutes. At 90 packages per shift, total gap = 72 minutes per shift.

Resolution path: standard problem (information check not documented) + tool problem (no pre-staged rolls). Fix 1: update the one-page standard to include a color batch confirmation protocol — 30 minutes to write. Fix 2: stage one new roll before the current roll reaches 20% remaining — 5-minute training, no cost. Estimated reduction in pure waste: 15–18 minutes per shift. Expected closure of gap: recalculated cycle time approximately 5.1–5.2 minutes, within 5% of takt time.

SECTION 6

The Worksheet

Tear this out, copy it onto a fresh sheet, or fill it in directly.

One Cell Consistently Misses Takt While Others Wait

Scenario: weekly throughput data shows one work cell consistently completing fewer units per shift than takt time requires, while upstream cells finish early and wait. The problem has appeared in three consecutive weekly measurements. The cell supervisor reports the team is working at full effort.

DIAGNOSTIC STEP	FINDING	DATA SOURCE
List all activities performed by the lagging cell in one shift (direct observation, 2 hours)		
Classify each activity: value-added / necessary non-VA / pure waste		
Calculate: what % of shift time is pure waste?		
Identify: which waste type dominates (waiting, motion, defects, overprocessing)?		
Is any work done by this cell that could move to a non-bottleneck cell?		
Is the work standard current and posted in the area?		
Is the cell short of a tool, material, or information that causes waiting?		
Has staffing in this cell changed in the past 6 weeks?		
Calculated cycle time at this cell vs takt time (gap in minutes)		

SECTION 6 (CONTINUED)

Reflection Prompts

After filling in the worksheet on the previous page, work through these.

1. Write the single largest waste category found in observation. Is it a tool problem, a layout problem, a standard problem, or a coordination problem? Each type has a different resolution path — write which path applies here.

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2. If the gap between cycle time and takt time is less than 15%: list non-bottleneck work currently done by this cell. Estimate minutes freed if offloaded. Does that close the gap without layout changes?

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3. Design the next weekly audit check for this cell specifically. What one number will confirm the issue is resolved?

SECTION 7

Tips and Traps

TIPS

- Sit in the area for the full two hours before classifying anything. Activities that look like waste in the first 20 minutes sometimes turn out to be necessary non-VA once the full shift sequence is visible.
- When the dominant waste is defects arriving from an upstream cell, the fix is upstream, not in this cell. Confirm the defect source before recommending any change to the lagging cell.
- Design the post-resolution audit check before leaving this worksheet. 'We will monitor it' is not an audit check. 'Cycle time at this cell, measured every Friday, compared against takt time' is.
- If pure waste share is below 10% and no non-bottleneck work is offloadable, the cell may genuinely need a layout change or additional resource. Run the takt time recalibration worksheet before making that decision.

TRAPS

- Trusting the cell supervisor's report of what the team does rather than running the two-hour direct observation. Supervisors report what they know is done, not what they have not noticed.
- Treating a standard problem as a compliance problem. If the standard does not reflect actual current working conditions, revision is the correct response — not enforcement.
- Resolving the gap mathematically but not verifying it physically. A 0.8-minute gap closed by calculation should show up as a measurably reduced gap in the following week's throughput data.

SECTION 8

Appendixes

Appendix A — Resolution Path by Dominant Waste Type

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Dominant waste: Waiting (personnel unavailability)
  Resolution: delegate approval, cross-train, adjust schedule.
  Do not: add staff to the waiting stage.

Dominant waste: Waiting (information unavailability)
  Resolution: update work standard to include the information-gathering step,
              or redesign process sequence so information arrives before it is needed.

Dominant waste: Waiting (tool / space unavailability)
  Resolution: pre-stage consumables, create a usage schedule for shared equipment,
              or add a low-cost duplicate tool at the bottleneck position.

Dominant waste: Motion
  Resolution: redesign the immediate work area (shadow positions, Seiton).
              Measure: reduce walking time from __ minutes to __ minutes per shift.

Dominant waste: Defects (from this cell)
  Resolution: update work standard, add an in-process quality check.
              Measure: defect rate at this cell per 100 units.

Dominant waste: Defects (arriving from upstream)
  Resolution: diagnostic must move upstream. This cell is not the root cause.
              Document the defect type and frequency, then run upstream observation.

Dominant waste: Overprocessing
  Resolution: clarify with the downstream stage or customer what is actually needed.
              Remove steps that exceed the confirmed specification.
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Appendix B — Post-Resolution Audit Check Design

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Write these three items before closing the diagnostic:

1. One metric that confirms the issue is resolved:
   Example: "Cycle time at labeling cell, measured by direct observation,
             less than or equal to takt time for 3 consecutive weeks."
   Your metric: _____________________________________________

2. Measurement method (who, how, how often):
   Example: "Supervisor observes and records 5 packages each Friday."
   Your method: _____________________________________________

3. Escalation trigger (if metric is not met after 2 weeks):
   Example: "If cycle time still exceeds takt time after 2 weeks of fix,
             escalate to cross-department VSM review."
   Your trigger: _____________________________________________
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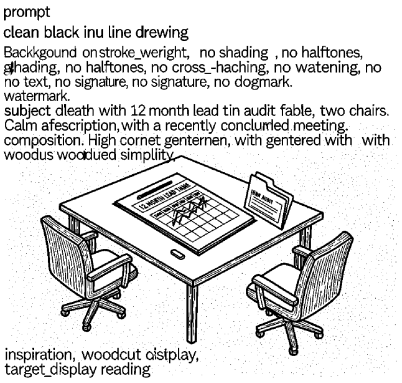

WHERE THIS WORKSHEET COMES FROM

Lean Operations Principles

Eliminate Waste Before Adding Capacity

by Ibrahim Anwar

This worksheet is one of nine in the *Lean Operations Principles* companion worksheet pack. The full pack is grouped into three categories: high-volume worksheets you can run weekly, niche-search worksheets for rare but high-value situations, and specific-case worksheets that walk you through a single concrete scenario.

Every framework, decision filter, and figure used in these worksheets is drawn from the chapters of the source book. The book sets the diagnosis, the worksheets give you the form to act on it.

Available on Google Play Books

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