

Teacher's & Workshop Guide: Ring 1 - The Integrity Check

Polya Studio Discovery Series

Introduction to the Workshop

Welcome to the Polya Studio. You are about to facilitate a Discovery Workshop designed to build Mathematical Agency. Unlike a traditional math class where you teach a formula and students repeat it, this studio relies on the "Guide on the Side" approach. Your primary role is to set up a physical environment that creates a conflict and then use simple questions to help the students resolve that conflict on their own.

The goal of Ring 1 is for students to discover that counting is an act of integrity. They will learn through direct experience that labels and authority can be incorrect, and that their own physical verification is the ultimate source of truth.

Part 1: The Station Setup

You must prepare the physical station before the students arrive to ensure the lesson succeeds. The station requires three specific items arranged to create an immediate, tactile friction.

First, you need a standard cardboard box or opaque container. You must write a large, official-looking label on the lid that reads "CONTENTS: 12 CONTROLLERS". This label represents Authority.

Second, place a plastic storage organizer or a slotted bin next to the box. This bin must have a strict physical constraint where it only has slots or space for exactly 10 items. This represents the Capacity or the Blocker.

Third, place a messy pile of 14 items, such as game controllers, blocks, or beanbags, on the table. This pile represents Reality.

When the students arrive, the conflict is already established because the Label says 12, the Bin fits 10, but the Reality is 14.

Part 2: The Workshop Dialogue

Stand back and allow the students to handle the items. Do not intervene unless they stop moving. You should use the following script to guide their discovery without giving them the answer.

Teacher's Nudge (The Guide)

"Here is the gear for the tournament. Can you pack it away for me?" (Hand them the messy pile and point to the labeled box and bin.)

Student's Action (The Discovery)

The team will immediately grab the items. They will likely try to shove the controllers into the box or the bin. They will act on "autopilot," assuming everything will fit perfectly.

(Wait for the friction. Watch them struggle as the items physically do not fit, or the lid will not close. Do not help them.)

The Friction Point occurs here. The students will stop moving. They will look at the pile and then the box. You will hear comments like, "Hey, these don't fit!" or "There are too many!" or "Who messed this up?"

"What does the box say?"

They will look at your official label and read that it says 12 Controllers.

"And what does the bin allow? Count the slots."

They will count the empty spaces in the organizer and realize there are only 10 slots.

"So, what is the truth? Don't guess. Draw the problem." (Hand them a whiteboard and marker. Point to the board.)

The team stops fighting the physical objects. They move to the whiteboard and begin to sketch the situation.

"Draw the three things we know. Draw the Label. Draw the Slots. Draw the Pile."

The Visualization begins. They draw a square with the number 12 to represent the Label. They draw a rectangle with 10 slots. They count the pile physically, finding 14, and write the number 14.

"Where is the lie?"

They look at their drawing and circle the number 12. They announce that the box is lying and the label is wrong.

"And where is the problem?"

They circle the gap between 14 (Reality) and 10 (Capacity). They state that they have 4 extra controllers.

"Excellent. If the label is wrong, and the bin is too small, what is your solution?"

The Resolution is found. They suggest changing the label to 14, getting a second box for the extra 4, or returning 2 if they were only supposed to have 12.

Part 3: The Visual Rule (The Truth Triangle)

Once the students have solved the problem, you should gather them around the whiteboard and draw the Truth Triangle diagram to cement the lesson.

The top point of the triangle is "What it SAYS," which represents the Label, Authority, or the Box. The bottom left point of the triangle is "What it FITS," which represents the Blocker, Capacity, or the Bin. The bottom right point of the triangle is "What IS," which represents the Count, Reality, or the Truth.

The Rule is that if these three points do not match, you have a problem. You must never trust the Label. You must always trust the Count.

Part 4: Teacher's Quiz (Pedagogy Check)

Question 1 What was your primary role during the "Friction Point" when the students were struggling?

A) To tell them the answer immediately so they do not get frustrated. B) To stand back and let them physically struggle with the items until they paused. *Correct Answer: B*

Question 2 Why do we ask them to "Draw the Problem"? A) Because drawing is a fun break from math. B) Because drawing forces them to stop acting on autopilot and visualize the conflicting data. **Correct Answer: B**

Question 3 What is the "Lie" in this exercise? A) The messy pile. B) The official label on the box.
Correct Answer: *B*

Part 5: Student's Quiz (Concept Check)

Question 1 You are given a box of LEGOs that says "500 Pieces" on the front. You need exactly 500 pieces for your build. What is the first thing you do? A) Start building immediately. B) Dump them out and count them to see if the box is telling the truth. **Correct Answer: B**

Question 2 Why did the controllers not fit in the bin during the workshop? A) The bin was broken. B) The "Reality" of 14 was bigger than the "Capacity" of 10. *Correct Answer: B*

Question 3 What is the Superpower of Ring 1? A) Guessing quickly to finish faster. B) Checking the truth by counting and verifying. *Correct Answer: B*

Closing Note

By the end of this session, your students have not just practiced counting. They have practiced Integrity. They learned that just because something is written down, like a label or a rule, it does not