Teacher's & Workshop Guide: Ring 6 - The Resource Manager (Efficiency)

Polya Studio Discovery Series

Introduction to the Workshop

Welcome to Ring 6 of the Polya Studio. In previous rings, students solved single problems: one count, one path, one bet. Ring 6 introduces **Complexity**. This is the world of Logistics, Scheduling, and Multi-Tasking.

Your role as the Guide is to overwhelm them. You will give them a task that is easy to do poorly, but hard to do well. You will simulate a "Delivery Day" where time is short and the stops are many.

The goal of Ring 6 is for students to discover **The Traveling Salesman Problem** (simplified). They will learn that doing things in *any* order is chaos, but doing things in the *right* order is efficiency. They will use the "Efficiency Triangle" to optimize their resources.

Part 1: The Station Setup

You must prepare a physical map that requires planning. You will need a "town" layout.

First, set up a **"Town Map."** Place 6 "Houses" (labeled A, B, C, D, E, F) scattered randomly around the room or on a large table. Do *not* put them in a circle; put some close together and some far apart. Place a "Depot" (Start Point) in one corner.

Second, provide **"The Fleet."** Give the team 3 students (or 3 toy trucks). These are their drivers.

Third, provide **"The Constraint."** This is the key. Tell them: "Each Driver can make exactly **2 stops**. No more. And you must visit ALL 6 houses in the shortest total time."

When the students arrive, the challenge is chaos: 6 locations, 3 drivers, and a clock ticking.

Part 2: The Workshop Dialogue

Stand back. Hand them the "Package List" (A, B, C, D, E, F). Start a timer. Watch them run around randomly.

Teacher's Nudge (The Guide)	Student's Action (The Discovery)
"Here is the map. Deliver to all 6 houses. You have 3 drivers. Each driver takes 2 stops. GO!"	The team will panic-start. Driver 1 will yell "I'll take A and F!" (even though A and F might be on opposite sides of town). Driver 2 will grab random stops.

(Wait for the Friction Point. Watch them cross paths, backtrack, and run inefficient routes.)	**The Friction Point.** They finish, but they are tired/slow. They realize Driver 1 drove 10 miles while Driver 2 only drove 2 miles. It wasn't fair or fast.
"That took 5 minutes. And look at the map—Driver 1 crossed Driver 2's path three times. Is that efficient?"	They look at the mess. "No. We wasted gas." "I had to drive all the way back across town."
"Stop driving. Start planning. Draw the Problem." (Hand them the whiteboard/map.)	The team stops moving. They look at the static map.
"Draw the Efficiency Triangle. Draw the Clusters, the Resources, and the Route."	**The Visualization.** They look at the map. They realize House A and House B are close together. House C and D are close together.
"Group the stops. Don't pick random letters. Pick neighbors."	**The Resolution.** They circle the "Clusters." They assign Driver 1 to the North Cluster (A & B). Driver 2 to the East Cluster (C & D). Driver 3 to the South Cluster (E & F).
"Now run the route again."	They run the simulation. Because they are assigned to *sectors*, nobody crosses paths. The total time drops significantly.

Part 3: The Visual Rule (The Efficiency Triangle)

Once they have clustered the stops and optimized the routes, gather them around the whiteboard. Draw the Efficiency Triangle diagram. This is the tool they will use for management.

The top point of the triangle is **THE CLUSTER** (The Grouping).

- *Which tasks/stops are close to each other? Do them together.*

The bottom left point of the triangle is **THE RESOURCE** (The Driver).

- *Who is available to take this cluster?*

The bottom right point of the triangle is **THE ROUTE** (The Path).

- *The shortest line connecting the cluster to the resource.*

The Rule: Never treat tasks as a random list. Always look for **Clusters**. Group similar tasks together, assign one resource to that group, and don't let paths cross.

Part 4: Teacher's Quiz (Pedagogy Check)

Question 1 Why do we restrict each driver to exactly 2 stops? A) Because 2 is a lucky number. B) To force the students to divide the work evenly and think about *which* 2 stops belong together. *Correct Answer: B*

Question 2 What usually happens in the first "Chaos Run"? A) They optimize perfectly. B) They pick stops based on letters (A & B) or just random grabbing, leading to long, crossing paths. *Correct Answer: B*

Question 3 What is a "Cluster"? A) A type of cereal. B) A group of tasks or locations that are close to each other and should be handled by the same person. *Correct Answer: B*

Part 5: Student's Quiz (Concept Check)

Question 1 You have to buy eggs, buy milk, and mail a letter. The grocery store is 1 mile North. The post office is 1 mile North. Your friend lives 5 miles South. How should you group these tasks? A) Do them in alphabetical order. B) Cluster the North tasks (Store & Post Office) together. Do them in one trip. *Correct Answer: B*

Question 2 Why is it bad for delivery routes to cross each other? A) It usually means you are backtracking and wasting fuel. B) It looks messy on a map. *Correct Answer: A*

Question 3 What is the Superpower of Ring 6? A) Driving very fast. B) Efficiency (Organizing tasks so you do less work for the same result). *Correct Answer: B*

Closing Note

By the end of this session, your students have practiced **Efficiency**. They learned that "Working Hard" (running around) is not the same as "Working Smart" (clustering). They moved from being "Busy Bees"