The Lighthouse Lemonade Mystery

Reasoning move: Confounding variable (correlation ≠ causation)
Grade band: Ages 11–14 / grades 6–8
Format: Mini-mystery (lead-gen taste), 2 student pages
Est. time: 15–25 minutes

1 · THE SOLUTION

A leaking pipe by the **north rocks** contaminated the water where kids swam — that's what made the swim team sick. The **lemonade stand looked guilty only because it was popular**: lots of kids drank lemonade, so lots of sick kids happened to have drunk it. But drinking lemonade and getting sick were both common; one didn't cause the other. **Swimming by the north rocks is the hidden third variable** driving the illness.

2 · THE BREADCRUMBS (WHERE THE TRUTH WAS HIDDEN)

- **Theo and Priya got sick but never drank lemonade** (brought their own water) — breaks the lemonade theory immediately. (In the story text + the data table.)
- **Coach Rivera's chart adds a third column** — "swam by the north rocks" — signaling the real variable to track. (Story + table header.)
- **The leaking pipe "quietly leaking all week"** mentioned in passing — easy to skim past, but it's the cause. (Story, final paragraph before the chart.)

3 · EXPECTED MISREADINGS (AND WHY THEY'RE PRODUCTIVE)

- **Most will think:** "It's the lemonade — half the team drank it and got sick." → Don't correct. Ask: "How many kids drank lemonade and were totally FINE? Go count them." (Answer: 3 of 6 lemonade-drinkers were fine — `Jonah, Liv, Bea`.)
- **Common trap:** counting only the sick kids, never looking at the well ones. → Surface by asking: "Who DIDN'T get sick, and what did they have in common?" (None of the fine kids swam the rocks.)
- **Disconfirming cases to point at:** `Theo, Priya` (sick, no lemonade) break the decoy; `Jonah, Liv, Bea` (lemonade, fine) confirm lemonade isn't it. Every single sick kid swam the north rocks; no rock-swimmer was fine.

4 · THE LIVE ARC (WHERE TO WITHHOLD, WHERE TO REVEAL)

- **Open:** Read the story aloud, stop at "The stand was shut down by Monday morning." Ask the room: "Case closed? Was it the lemonade?" Let them commit to yes.
- **The gap to preserve:** When someone notices Theo and Priya never drank lemonade — don't jump in. Let the table sit there. "Huh. So if it's not the lemonade… what is it?" Sit in that silence for 60+ seconds. This is the moment the real thinking starts.
- **The reveal:** Don't announce "it's the rocks." Hand-draw two columns live — sick kids vs. rock-swimmers — and let them watch the lists turn out identical. The diagram drawn in real time lands harder than a finished chart.

Land on metacognition: "What made you change your mind from 'it's the lemonade'? What did you notice about how YOU think when something looks obvious?"

REASONING MOVES TO SURFACE (FACILITATOR PROMPTS)

- "What's the difference between something being popular and something being the cause?"
- "What would the data look like if lemonade really were the cause? Does it look like that?"
- "Is there a third thing that could explain BOTH who drank lemonade and who got sick?" (This is the confounding move, named.)
- "Where else in real life do people blame the popular thing instead of the hidden cause?" (Optional lateral-transfer bridge → LoopBack.)

Innopath