

Competition Corner: Bounded Environmental Inference

Optional Extension | g10_u08_w30

Use only the worksheet data card: A (7.2, 310, 3), B (6.8, 520, 15), C (7.0, 460, 10) for (pH, conductivity, turbidity), one modeled reach at 10:00 on 14 Oct. This is not a field protocol, source identification, safety finding, health claim, policy conclusion, or prediction.

1. The conductivity change $A \rightarrow B$ is $210 \mu\text{S}/\text{cm}$. The change $B \rightarrow C$ is $520 - 460 = 60 \mu\text{S}/\text{cm}$. What fraction of the $A \rightarrow B$ difference remains between C and A? State only a numerical comparison, not a cause.
2. A student says, "The pH pattern $A > C > B$ proves the tributary caused every printed difference." Identify the strongest supported part and two unsupported additions.
3. Write the narrowest valid conclusion from the fact that B has the largest values for conductivity and turbidity, but the lowest pH.
4. Name the minimum new *categories* of evidence needed to test (not prove) a proposed source explanation. Do not propose sampling steps.

Key. 1. $150/210 = 5/7 \approx 71\%$ remains; this is a numerical relation only. 2. Supported: the printed ordering. Unsupported: causation by the tributary and extension to every difference. 3. At the stated sites/time, B is highest in the two listed columns and lowest in pH; no source or effect is established. 4. Examples: repeat observations under stated conditions, chemical identity/concentration evidence, and source-tracing/flow-context evidence.