Saltwater Clues

A model explanation of an environmental investigation.

CCSS.ELA-Literacy.WHST.11-12.2 "Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the words that move the procedure or reasoning forward, and circle sentences that explain why a step, result, or limitation matters.

Testing Pond Water

1. To investigate whether road salt was changing a schoolyard pond, an environmental science class planned a controlled water test. They collected water from the pond in clean bottles and labeled each sample with its location and date. Back in the lab, the class used a conductivity meter to measure how easily each sample carried an electric current. Dissolved ions, including sodium and chloride from salt, increase conductivity. The meter therefore offered an indirect way to compare salt-related dissolved material among the samples rather than relying on a single observation of cloudy water.

2. Before taking measurements, the class rinsed each probe with distilled water and blotted it dry. This step reduced the chance that residue from one sample would affect the next. Students poured equal amounts of water into separate beakers, then placed the probe in each beaker until the display stabilized. They recorded every reading in a shared log and measured each sample three times. Repeated measurements made it easier to notice an unusual result and to calculate a mean. The class also tested distilled water as a comparison sample, because it should contain very few dissolved ions.

3. The results showed a pattern rather than a final proof. Water collected beside the parking lot had the highest mean conductivity, while water from the pond's far edge had the lowest. This difference supported the idea that runoff may have carried dissolved salt toward the pond. However, conductivity can rise for other reasons, such as minerals in soil or fertilizer runoff. The class concluded that later tests should include more locations and should compare samples before and after winter storms. By stating both the evidence and its limits, the report explains why further investigation is needed.

2 ANSWER WITH EVIDENCE

Use the passage

1. What investigation question guides the report, and why did the class measure conductivity?

2. Name two controls or reliability steps in paragraph 2. Explain how each improves the investigation.

3. What comparison in paragraph 3 supports the explanation that runoff may have carried salt toward the pond?

4. Why does the report describe the results as a pattern rather than final proof? Include one possible alternate cause and one next step.

3 YOUR TURN

Your own words

Write one explanatory paragraph of 90 to 110 words that describes a fair test comparing how much water two paper towel brands absorb. State the purpose, sequence at least three steps, explain why one step matters, and end by explaining how the test stays fair.

ANSWER KEY

Saltwater Clues

PART 1 · READ AND MARK

Underline the words that move the procedure or reasoning forward, and circle sentences that explain why a step, result, or limitation matters. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	What investigation question guides the report, and why did the class measure conductivity?	**The class investigated whether road salt was changing the pond water. It measured conductivity because dissolved ions, including sodium and chloride from salt, increase conductivity.**
2	Name two controls or reliability steps in paragraph 2. Explain how each improves the investigation.	**Rinsing and blotting the probe reduces residue from an earlier sample. Using equal amounts of water makes the samples comparable. Accept repeated measurements to identify unusual results and calculate a mean, or distilled water as a comparison sample.**
3	What comparison in paragraph 3 supports the explanation that runoff may have carried salt toward the pond?	**The sample beside the parking lot had the highest mean conductivity, while the sample from the pond's far edge had the lowest.**
4	Why does the report describe the results as a pattern rather than final proof? Include one possible alternate cause and one next step.	**Conductivity can also increase because of minerals in soil or fertilizer runoff. A next step is to test more locations or compare samples before and after winter storms.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

To compare the water absorbed by two paper towel brands, cut equal-size sheets and weigh each dry sheet on a digital scale. Pour 100 milliliters of water into a shallow dish, then soak one sheet for ten seconds. Hold it above the dish for five seconds so extra water can drip back. Weigh the wet sheet and subtract its dry mass from its wet mass. Repeat the procedure twice for each brand, then compare the mean mass gains. Equal sheet sizes, water amounts, soaking time, and dripping time make the comparison fair.

Accept responses that accurately explain the investigation's purpose, procedure, evidence, and limits using details from the passage. For the open response, accept a 90 to 110 word paragraph with a logical sequence, a reason for a step, and clear controls for a fair comparison.