The pH Sort

Plan a fair test and classify solutions using pH evidence.

CHE.9.3 "Enrichment: Plan and conduct investigations using the pH scale to classify acid and base solutions."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the pH rules, circle the steps that keep the test fair, and number the sample names in the table from lowest to highest pH so you can use the evidence to classify them.

Four Samples, One Probe

1. At a school lab, four unlabeled, water-based samples need sorting for a pH investigation. A pH below 7 indicates an acidic solution, a pH of 7 indicates a neutral solution, and a pH above 7 indicates a basic solution. Smaller pH values mean more acidic conditions. A reading near 7 is not necessarily neutral; compare the measured value with 7.

2. To plan a fair test, use the same calibrated pH probe for every sample and keep each sample in its own labeled beaker. Wear goggles. Rinse the probe with distilled water and gently blot it between tests so one solution does not change the next reading. Test each sample twice and record both values.

3. The lab group followed that plan and recorded the readings below. They did not taste or touch the solutions. When two readings for a sample are close, use both to support its classification. If a result seems surprising, rinse and blot the probe, then measure again. The readings show evidence, not the chemical identity of a sample.

PH PROBE READINGS

Sample	First reading	Second reading
A	2.8	3.0
B	7.0	7.0
C	9.3	9.1
D	6.1	6.3

2 ANSWER WITH EVIDENCE

Use the passage

1. Which is more acidic, sample A or sample D? Use both samples' readings to explain.

2. Classify sample B as acidic, neutral, or basic. What evidence supports your choice?

3. Classify sample C as acidic, neutral, or basic. What evidence supports your choice?

4. Classify sample D. Then describe one step you would take before measuring it again to check for contamination.

3 YOUR TURN

Your own words

Design a pH test for two new, unlabeled water-based samples, X and Y. Explain how you would prevent contamination, give two possible readings for each sample, and classify each from those readings.

The pH Sort

PART 1 · READ AND MARK

Underline the pH rules, circle the steps that keep the test fair, and number the sample names in the table from lowest to highest pH so you can use the evidence to classify them. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Which is more acidic, sample A or sample D? Use both samples' readings to explain.	**A is more acidic. Its readings, 2.8 and 3.0, are lower than D's readings, 6.1 and 6.3.**
2	Classify sample B as acidic, neutral, or basic. What evidence supports your choice?	**B is neutral because both readings are 7.0.**
3	Classify sample C as acidic, neutral, or basic. What evidence supports your choice?	**C is basic because both readings, 9.3 and 9.1, are above 7.**
4	Classify sample D. Then describe one step you would take before measuring it again to check for contamination.	**D is acidic because both readings are below 7. Rinse the probe with distilled water and gently blot it before remeasuring.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

I would wear goggles and put X and Y in separate labeled beakers. I would use the same calibrated pH probe for both samples, rinsing it with distilled water and gently blotting it between tests. I would test each sample twice. If X gave readings of 5.0 and 5.1, I would classify it as acidic. If Y gave readings of 8.2 and 8.3, I would classify it as basic.

Accept classifications supported by both pH readings. For the open task, accept other plausible pairs of readings if each classification matches its readings and the plan prevents contamination.