Pond pH Mystery

Use pH data to investigate a change in pond water

FB.2 "Students will demonstrate an understanding of the structure and interactions of matter and how the organization of matter supports living organisms. Develop and use simple atomic models to describe the components of elements (e.g...."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the rules for classifying pH. Circle the two readings in the table that show how the pond changed.

A Clear Pond, A Changed Reading

1. A student monitors a classroom pond after heavy rain. The water looks clear, but appearance cannot reveal whether dissolved substances have changed its pH. On the pH scale, values below 7 are acidic, 7 is neutral, and values above 7 are basic. Lower numbers indicate greater acidity; higher numbers indicate greater basicity.

2. The student tests the pond before and after rain, then tests two familiar liquids for comparison. Each reading is recorded in the table. The comparison liquids are not pond treatments. A pH reading describes a solution, not its safety. A change in pond pH may matter even if the water still looks the same.

MEASURED PH

Sample	pH
Pond before rain	7
Pond after rain	5
Lemon juice	2
Baking soda solution	8

3. Fish and microscopic pond organisms use proteins called enzymes to carry out cell reactions. An enzyme's shape, and therefore its activity, can change when pH shifts outside the range the organism tolerates. Different species tolerate different ranges, so a single reading cannot prove that fish are harmed. It can signal a need to investigate further.

2 ANSWER WITH EVIDENCE

Use the passage

1. Classify the pond water before and after rain as acidic, neutral, or basic. Use both readings to support your answer.

2. Which is more acidic, the pond after rain or the lemon juice? Explain using their pH readings.

3. Classify the baking soda solution. How does its pH compare with the pond's pH before rain?

4. Why might the pond's pH change matter to living things, and what can you not conclude from this reading alone?

3 YOUR TURN

Your own words

A different pond reads pH 9 after a storm. Write a three-sentence note to its caretaker that classifies the water, compares it with the classroom pond after rain, and explains a next step based on how pH can affect living things.

Pond pH Mystery

PART 1 · READ AND MARK

Underline the rules for classifying pH. Circle the two readings in the table that show how the pond changed. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Classify the pond water before and after rain as acidic, neutral, or basic. Use both readings to support your answer.	**The pond was neutral before rain at pH 7 and acidic after rain at pH 5.**
2	Which is more acidic, the pond after rain or the lemon juice? Explain using their pH readings.	**Lemon juice is more acidic. Its pH of 2 is lower than the pond's after-rain pH of 5.**
3	Classify the baking soda solution. How does its pH compare with the pond's pH before rain?	**The baking soda solution is basic at pH 8. Its pH is higher than the pond's before-rain pH of 7.**
4	Why might the pond's pH change matter to living things, and what can you not conclude from this reading alone?	**A pH change can affect enzymes that carry out cell reactions. The reading alone does not prove that pond organisms are harmed.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

A pH of 9 means this pond water is basic. Its reading is higher than the classroom pond's after-rain reading of 5, which is acidic. Because pH changes can affect enzymes, check which species live in the pond and test again before deciding whether they are at risk.

Accept comparisons that correctly identify lower pH as more acidic. For the note, accept a specific investigation of species tolerance or further testing; students should not claim the reading alone proves harm.