What pH Reveals

Use pH data to investigate liquids in living systems.

FB.2.4 "Analyze and interpret data to classify common solutions such as acids, bases, or neutral. Communicate the importance of pH in living systems."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the three rules for classifying pH, then circle each reading in the table and write A, B, or N beside it for acid, base, or neutral.

Clear Liquids, Different Chemistry

1. At a health science lab, students test clear liquids that look alike. Appearance cannot show whether a sample is acidic, basic, or neutral. A pH reading provides evidence: values below 7 indicate acids, 7 is neutral, and values above 7 indicate bases. A decrease of one pH unit means roughly ten times the hydrogen ion concentration.

2. The table gives pH readings from samples taken or prepared at one moment. Body fluids vary with conditions, so these are examples, not fixed values. Stomach fluid helps break down food and limits many microbes. When food enters the small intestine, fluid released by the pancreas helps counter the stomach fluid.

PH OF FOUR SAMPLES

Sample	pH reading
Stomach fluid	2.0
Pancreatic fluid	8.2
Blood	7.4
Distilled water	7.0

3. Blood pH must stay within a narrow range because cells and their proteins function best under certain conditions. A large shift can disrupt chemical reactions even if the blood stays on the same side of neutral. Compare each reading with 7 to classify the sample, then consider why its pH matters in a living system.

2 ANSWER WITH EVIDENCE

Use the passage

1. Classify the stomach fluid and pancreatic fluid. Give the pH reading that supports each classification.

2. Which sample is neutral? How does its reading show this?

3. Compare blood with distilled water. What category is each sample in, and which has the higher pH?

4. Why could a change from the blood reading in the table matter even if the blood remained basic?

3 YOUR TURN

Your own words

After a storm, a pond's pH falls from 7.0 to 6.0. In three sentences, classify the water before and after the storm, describe how its acidity changed, and explain one possible effect on pond organisms.

What pH Reveals

PART 1 · READ AND MARK

Underline the three rules for classifying pH, then circle each reading in the table and write A, B, or N beside it for acid, base, or neutral. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Classify the stomach fluid and pancreatic fluid. Give the pH reading that supports each classification.	**Stomach fluid is acidic at pH 2.0. Pancreatic fluid is basic at pH 8.2.**
2	Which sample is neutral? How does its reading show this?	**Distilled water is neutral because its pH is 7.0.**
3	Compare blood with distilled water. What category is each sample in, and which has the higher pH?	**Blood is basic at pH 7.4, while distilled water is neutral at pH 7.0. Blood has the higher pH.**
4	Why could a change from the blood reading in the table matter even if the blood remained basic?	**Blood must stay within a narrow pH range. A shift could disrupt the work of cells and proteins even if its pH stayed above 7.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Before the storm, the pond water was neutral at pH 7.0. Afterward, it was acidic at pH 6.0, with roughly ten times the hydrogen ion concentration. This change could stress pH-sensitive pond organisms by disrupting processes their cells need.

Accept acid, base, and neutral classifications supported by the correct readings. For the pond response, accept a plausible effect on organisms without requiring a claim that pH 6.0 harms every species.