Choosing a Measurement for an Ink Wash

Base your answers on the information provided and your knowledge of chemistry. Use the 2025 Chemistry Reference Tables as needed.

A class compares equal volumes of liquid before and after a model ink wash. The colored marker in the liquid changes color with pH. A second measurement reports marker amount without relying on its color.

Sample	pH	Color intensity (model units)	Marker amount (mg)
Before wash	7.0	12	4.0
After wash	5.0	4	4.0

1 Which statement follows from both measurements?

(1) The marker amount fell because the color faded.

(2) The marker amount stayed the same while pH and color intensity changed.

(3) The pH stayed the same while the marker amount changed.

(4) The color reading proves the marker became a different element.

2 Explain why a new calibration made at pH 7.0 might give the wrong marker amount for a sample at pH 5.0. [1]

Answer and work

The class wants to isolate the effect of pH on the marker’s color. It has equal portions of one marker solution and a model control that adjusts pH without changing the amount of marker.

3 Describe a matched comparison that tests this effect. State what should be changed and what should be measured. [1]

Answer and work

4 If the class wants to compare marker amounts using only color, identify one condition the standards and samples must share in this model. [1]

Answer and work