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Meascom School Science Series

Acids & Bases – pH Experiment Using the Meascom School pH Tester

Name: _____

Class: _____

Date: _____

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1. What is pH?

The **pH scale** measures how acidic or alkaline a liquid is.

pH Range	Description
0–3	Strong acid
4–6	Weak acid
7	Neutral
8–10	Weak base
11–14	Strong base

Important:
The pH scale is **logarithmic**, meaning each step is **10× stronger** than the previous one.

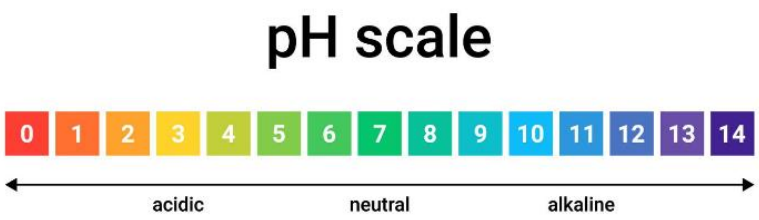

Figure 1. The pH Scale

Important Note

Before we start, note that the pH probe has a glass bulb to measure the pH. It is easy to break the glass bulb, so place the probe gently in the test liquid or buffers. The small plastic cups for buffers and samples are softer than a glass beaker, which helps protect the probe tip. Even so, avoid direct impact on the tip. When the probe is not being used, replace the probe cover.

2. Calibrating the pH Tester

Before taking measurements, scientists check that instruments are calibrated. We are going to check the calibration with 3 different buffers. The buffers used here are NIST standard buffers. 4.01 (acid), 7.00 (neutral) and 10.01 (alkaline)

Figure 2: School Science pH Pen Style Tester, Buffers and KCl storage solution.

Step 1

Prepare the buffers. Using the 30ml cups provided, squeeze out approx. 12ml of each buffer into the cup marked for that buffer. Close the buffer bottles to keep the buffers safe.

Remove the probe cover and rinse the probe with clean water.

Step 2

Place the probe in **pH 7.00 buffer solution**

Record the reading

pH = _____

Step 3

Rinse the probe again.

Step 4

Check with **pH 4.01** and **pH 10.01** buffer solutions.

Step 5

If the probe readings are far from the expected readings, let the teacher know, so that the probe can be calibrated, before you continue.

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3. Predict the pH

Before measuring, make a **prediction**.

Sample	*Predicted pH*
Lemon juice	
Rainwater	
Baking powder solution	
Soap solution	

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4. Measure the pH

Use the **Meascom pH Tester** to measure each sample.

Rinse the probe well between samples so you do not contaminate samples.

Sample	*Measured pH*
Lemon juice	
Rainwater	
Baking powder solution	
Soap solution	

5. Plot Your Results

Mark the measured values on the pH scale.

Lemon juice	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
Rainwater	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
Baking Powder solution	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
Soap Solution	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

6. Think Like a Scientist

1. Which sample had the **lowest pH**?

2. Which sample had the **highest pH**?

3. Was rainwater acidic, neutral or alkaline?

4. Why is rainwater slightly acidic?

5. Why do scientists calibrate instruments before taking measurements?

7. Instrument Care

After the experiment:

1. Rinse the glass bulb of the probe with clean water
2. Place 5-10 drops of **KCl storage solution** in the probe cap
3. Replace the cap.

This keeps the **pH electrode hydrated and accurate**. Never store the probe dry or in distilled water or in any solution other than KCl.

8. Safety Instructions

- Do not drink any samples
- Wash hands after experiment
- Strong chemicals (e.g., drain cleaner) should only be handled by teachers