TABLE 3 Approximate pH Range of Some Common Materials (at 25°C)			
Material	рН	Material	рН
Gastric juice	1.0-3.0	Bread	5.0-6.0
Lemons	1.8–2.4	Rainwater	5.5–5.8
Vinegar	2.4–3.4	Potatoes	5.6-6.0
Soft drinks	2.0-4.0	Milk	6.3–6.6
Apples	2.9–3.3	Saliva	6.5–7.5
Grapefruit	2.9–3.4	Pure water	7.0
Oranges	3.0-4.0	Blood	7.3–7.5
Cherries	3.2–4.7	Eggs	7.6–8.0
Tomatoes	4.0–4.4	Sea water	8.0-8.5
Bananas	4.5–5.7	Milk of magnesia	10.5

Suppose the $[H_3O^+]$ in a solution is greater than the $[OH^-]$, as is true for acidic solutions. For example, the pH of an acidic solution at 25°C with a $[H_3O^+]$ of 1×10^{-6} M is 6.0.

$$pH = -log [H_3O^+] = -log (1 \times 10^{-6}) = -(-6.0) = 6.0$$

The pH of this solution is less than 7. This is the case for all acidic solutions at 25°C. The following calculation shows that the pOH is greater than 7.0, as is true for all acidic solutions at 25°C.

$$pOH = 14.0 - pH = 14.0 - 6.0 = 8.0$$

Similar calculations show that the pH of a basic solution at 25°C is more than 7.0 and the pOH is less than 7.0. These and other relationships are listed in **Table 4.** Remember that as the temperature changes, the exact values will change because the value of K_w changes. However, the relationship pH + pOH = p K_w will remain the same.

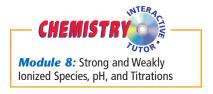




TABLE 4 [H ₃ O ⁺], [OH ⁻], pH, and pOH of Solutions			
Solution	General condition	At 25°C	
Neutral	[H ₃ O ⁺] = [OH ⁻] pH = pOH	$[H_3O^+] = [OH^-] = 1 \times 10^{-7} \text{ M}$ pH = pOH = 7.0	
Acidic	[H ₃ O ⁺] > [OH ⁻] pH < pOH	$[H_3O^+] > 1 \times 10^{-7} M$ $[OH^-] < 1 \times 10^{-7} M$ pH < 7.0 pOH > 7.0	
Basic	[H ₃ O ⁺] < [OH ⁻] pH > pOH	$[H_3O^+] < 1 \times 10^{-7} M$ $[OH^-] > 1 \times 10^{-7} M$ pH > 7.0 pOH < 7.0	