General pH Strategy: Finding the pH after Acid or Base is added to a solution

- Whether it be to a buffer solution, a strong acid solution, a weak acid solution, a strong base solution or a weak base solution prior to the new addition
- The strategy is similar to when we added acid or base to a buffer

6. Write out the acid-base reaction
   - It helps to recognize which species are acidic or basic or neutral, and weak or strong
7. Calculate the initial moles
   - Number of moles = molarity x volume (in Liters)
8. Use ICE to determine post-reaction ("E") moles
9. Assess the post-reaction situation, based on what's left at the end
10. Solve the pH problem from there

	Post-Reaction Situation		
1	Strong acid only	$[H^+] = [SA]$	
2	Strong acid plus weak acid	$[H^+] = [SA]$	Ignore WA, which makes insignificant contribution
3	Strong base only	$[HO^-] = [SB]$	
4	Strong base plus weak base	$[HO^-] = [SB]$	Ignore WB, which makes insignificant contribution
5	Weak acid only	$[H^+] = \sqrt{K_b x [WB]}$	Qual: pH < 7
6	Weak base only	$[HO^-] = \sqrt{K_b x [WB]}$	Qual: pH > 7 May need to find K_b from K_a
7	Weak acid plus weak base	$pH = pK_a + \log \frac{[base]}{[acid]}$	Buffer solution
8	No acid or base; only neutral salts	pH = 7.0	

- For many of these, it will be necessary to calculate molarities
- To do this, make sure that you factor in the total, combined volume

Key: Recognizing the Final Situation!!