AP and IBO Correlations

AP and IBO correlations to the activities in this manual
*NOTE: The primary learning objective for that activity is shown in a **bold** type.*

Activity	Lab Activity	AP Learning Objective	AP Science Practice	IBO Standard
1	*Modeling Chemistry* Students compare various physical and chemical changes while gaining an understanding of sensors and representing reactions at the particulate level.	2.3, 2.5, 3.1, **3.10**, 5.10	1.1, 1.3, 1.4, 4.3, 5.1, 5.2, 6.1, 6.2, 6.4	1.1, 4.1, 4.4
2	*Light, Color, and Concentration* Students learn how to use visible light to determine the concentration of colored ion species in a solution.	**1.16**	4.1, 4.2, 4.3, 5.1, 5.3	1.3
3	*Gravimetric Analysis* Through gravimetric analysis, students identify an unknown alkali metal carbonate.	1.3, **1.19**	4.3, 5.2, 6.1	1.3
4	*Stoichiometry of Solutions* Students perform analytical techniques to determine the concentrations of dissolved ions.	1.20, 3.3, **3.4**	2.2, 5,1, 6,4	1.3
5	*Polar and Nonpolar Substances* Students understand how a compound's structure influences its solubility in water and oil. They apply this knowledge to extract polar and nonpolar compounds from a mixture.	**2.8**, 2.13	1.4, 5.1, 6.1, 6.2	4.4
6	*Solubility* Students determine the saturation concentration of a compound and the mass of a dissolved solute.	2.15, 2.19, **6.21**	4.3	1.3
7	*Empirical Formula* Students use stoichiometric calculations to analyze the results of a reaction carried out in the laboratory.	**3.6**	2.2, 5.1	1.2
8	*Measuring Vitamin C – A Redox Titration* Students expand their understanding of titrations, carry out a redox titration, and then use the redox titration method to answer a question of their own design.	**3.9**, 1.20	4.2, 4.3, 5.1	9.1
9	*Factors that Affect Reaction Rate* Students explore several variables that could affect the rate of a chemical reaction.	**4.1**	4.2, 5.1	6.1
10	*Measuring the Speed of a Reaction* Students determine the order of a reaction and the effect of variables on the reaction rate.	**4.2**	4.2, 5.1, 5.3	16.1
11	*Energy in Chemical Reactions* Students demonstrate that the heat q is dependent on reaction conditions but the change in enthalpy ΔH is a constant quantity. They also discover and employ the additive nature of ΔH.	**5.7**	5.1	5.1, 5.2, 5.3
12	*Chemical Equilibrium* Students manipulate variables to explore how to control the direction of a reversible chemical reaction.	**6.9**, 6.10	4.2	7.1, 17.1
13	*Shape of Titration Curves* Students determine the fundamental shape of a titration curve and the parameters that can cause it to change.	1.20, **6.12**, 6.13	4.1, 4.2, 6.4	1.3, 8.1-8.4, 18.1, 18.4

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14	*Weak Acid Titration* Students titrate monoprotic and polyprotic weak acids and determine the relationship between the shapes of the curves and the K_a.	6.12, **6.13**	1.4, 5.1	1.3, 8.1-8.4, 18.1, 18.4
15	*Introduction to Buffers* Students create and analyze a buffer system.	**6.20**	1.4, 6.4	18.3
16	*Buffer Properties* Students analyze the nature of buffers as they prepare buffer solutions of a specified pH and test their efficacy.	**6.18**	4.2, 6.4	18.3
17	*Moving Electrons* By electrolyzing a variety of aqueous solutions, students determine a relationship between current, electric charge, and quantity of electrons.	3.12, **3.13**	4.1, 6.1	9.1, 9.2, 19.1,