2019-2020 Spring Chemistry Standards - Mastery Levels

Standard	Sub-Standard ("standards" for assessing)	Mastery Levels
1. Protocols (AL1-FL20)	1.A - Lab Safety	4 - No violations; 90%+ on Safety Test
		3 - 1 violation
		2 - 2 violations
		1 - Removed safety gear before being instructed to; multiple instances of same violation
	1.C - Plan & Carry Out Investigations (Toxins Lab Practical)	4 - Includes all required components for a procedure (tested for dissolving with cabbage juice or water, tested reaction with vinegar, tested pH with cabbage juice) - explained how to test each substance and included clean up
		3 -
		2 - Procedure was good, except tested pH after adding vinegar to the unknown substances
		1 - Performed one of the tests correctly
	1.D - Collect & Analyze Data	4 - table format, include observation, 3 tests, and heading
		3 - table format include observations, 2 tests, and heading OR copied conclusion table with good observations
		2 - table format include observations, 1 test, and headings
		1 - some sort of table, incomplete info
	1.E - Communicate Information	4 - good reasoning and all correct, 2 pieces of information
		3 - got pH colors mixed up so the substances were flipflopped (acid/base) with good reasoning, 2 incorrect but the rest have corrett substances and 1 valid piece of evidence
		2 - 3 incorrect, but 1 valid piece of evidence for the 2 correct substances
		1 -

13. Chemical Equations (TL1-TL6)	13.A - Translating Chemical Equations (Trans Chem Eqns)	4 - All correct: 1) Chemical names 2) Phases (refers to "aq" as solution) and 3) Words for + and →
		3 - 1 minor error in ONE category
		2 - Simple translation is correct; Second translation: Some errors in TWO categories...phases (refers to "aq" as liquid), symbols, or chemical names
		1 - Both translations have only ONE category correct. Example: Has phases ONLY for both
	13.B - Balancing Chemical Equations (Balan Chem Eqns)	4 - Coefficients correct AND atom inventory
		3 - 1 coefficient wrong but atom inventory reflects the error (or multiples of coefficients - not simplified)
		2 - 1 correctly BCE but wrong atom inventory
		1 - Only correct initial atom inventory
	13.C - Conservation of Mass (Cons of Mass)	4 - Correct atom inventory AND determination with explanation
		3 - Correct determination but incorrect atom inventory with good explanation
		2 - Correct determination but good explanation but no inventory
		1 - Correct determination; weak explanation or inventory - Incorrect determination with good explanation of conservation of mass (miscount in atom inventory led to this conclusion)
		0 - NO or YES but nothing else; no work; explanation misses the point. Example: different subscripts don't mix together | more products than reactants (counting compounds, individual atoms)
14. Moles & Molarity (TL7-TL16)	14.A - Conversions	4 - Correct answer with units, shows all work including proper unit cancellations
		3 - Performed both simple calculations properly, made mistake in third cancellation on ion calculation.
		2 - Performed one simple unit cancellation properly, but made major mistakes in other simple unit cancellation with something correct in third cancellation - Performed both simple calculations properly, with nothing relevant for third ion calculation
		1 - Started unit conversions correctly, but nothing else correct
	14.B - Molar Mass	4 - Correct answer with units, shows all work
		3 - Minor error (wrong or missing units) but shows all work correct - Very slight math miscalculation (addition)
		2 - Correct calculation for one molar mass with an error in units and major mistake in second calculation
		1 - Work attempted (information obtained and recorded from periodic table), but no correct answers or units
	14.C - Molarity	4 - Correct answer with units, shows all work including proper unit cancellations
		3 - Correct work, incorrect/missing answers (including incorrect/missing units), or has a MINOR molar mass issue
		2 - Mostly correct work, incorrectly found molar mass, correctly found all conversions, but work and answer are upside-down
		1 - Started unit conversion correctly, nothing else correct

15. pH (TL17-TL22)	15.A - pH and [H+]	4 - Correctly used the pH formula and identified acid/base/neutral referring to concentration.
		3 - No correct use of pH formula, but good identification of acid/base/neutral referring to concentration.
		2 - No correct use of pH formula, poor identification of acid/base/neutral referring to concentration.
		1 - Correctly used pH formula, nothing else correct
	15.B - Dilutions	4 - GFUPSA/work shown, correct answer with appropriate units, correct equation
		3 - GFUPSA/work shown, correct answer (NO units), correct equation -or- minor math error
		2 - Plan step incorrect, substitution error that results in incorrect answer with units
		1 - GFU correct - must have identified each of the givens with accurate variable
	15.C - Neutralization	4 - Correct identification of how neutralization occurs, including correct reference to acid/base or pH scale identification
		3 - Explains how to use dilution to neutralize
		2 - Correct identification of how neutralization occurs, has acid/base backwards relative to pH scale
		1 - Acid/base backwards and no reference to pH scale
16. Stoichiometry (TL23-TL26)	16.A - Mole Ratio	4 - Correct calculation with explanation
		3 - Minor error (no units, error in calculation), proper work OR
		2 -
		1 - Answer, but bad reasoning, or attempt to use coefficients
	16.B - Stoichiometry	4 - Correct calculation of second substance
		3 - Correctly calculated second substance with units of mols (did not convert to grams) - Work includes incorrect mole ratio, but worked from mass of given to mass of desired
		2 - No mole ratio - changed from mass of given to mass of desired without mole ratio
		1 - Converted from mass to mol of given substance
17. Observing Energy (FL1-FL6)	17.A - Specific Heat Capacity	4 - Correct identification of substance and showed calculations or explanation of specific heat capacity
		3 - Correct identification of substance with statement that Cp
		2 - Showed correct Cp calculations for both substances with either no explanation or incorrect identification of substance
		1 - Incorrect identification of substance with reversed Cp explanation
	17.B - Energy in Phase Changes	4 - All calculations correct
		3 - Simple math error (units)
		2 - Correctly calculated two steps
		1 - Used one equation for the entire temperature change, without any other errors Performed one calculation for one step correctly

18. Measuring Energy (FL7-FL9)	18.A - Combustion	4 - Balanced combustion equation
		3 - Correctly written combustion equation; unbalanced
		2 - 2 substances written in correct places
		1 - 1 substance written in correct place
	18.B - Calorimetry	4 -
		3 - Minor mistake, incorrect or no units
		2 - Cp calculation with units (used Cheeto mass instead of water) AND cal/g calculation attempted with answer to part A
		1 - Cp calculation with units (used Cheeto mass instead of water) but missing cal/g calculation
19. Understanding Energy (FL11-FL13)	19.A - Bond Energy	4 - Correct structures, calculation and units, reasoning for exo/endo from heat of reaction
		3 - Minor mistake, incorrect or no units - All correct calculations, but reversed endo/exo based on ΔH
		2 - Incorrect structures drawn but based calculation, units, and reasoning for exo/endo on the incorrect structures
		1 - Correct structures only or explained exo/endo from ΔH
	19.B - Reaction Rates	4 - Correct factors, uses molecules/particles, references collision theory in all three explanations
		3 - Correct factors, uses terms molecules/particles, references collision theory in 1 or 2 reactions
		2 - Correct factors, uses terms molecules/particles, does not reference collision theory
		1 - Correct factors, no mention of molecules/particles in 1 or 2.
20. Controlling Energy (FL15-FL18)	20.A - Redox Rxns	4 - Correct answers, correct oxidation states on all, or showed total charges for ions
		3 - Correct answers, with incorrect oxidation states on compounds
		2 - Correct answers, missing work on 1 compound - Correct charges, backwards identification of oxidation/reduction
		1 - Found charges, nothing more
	20.B - Heat of Formation	4 - Correct answer, with good reasoning
		3 - Correct work, good reasoning, but no/wrong units in work and/or answer
		2 - Correct work, no answer - Correct work, bad reasoning, and no units
		1 - Correctly refers to ΔH - no mole calculation