

Physical Setting Chemistry June 2010 Item Analysis

Question #	% Gap	Possible Causes For Error	Strategy To Increase Performance	Brief Description of Strategy
60- CR	30.17%	There are three equations to calculate heat in the reference tables. Students used wrong equation ($q=mC\Delta T$). Students do not know when to use what formula and do not know the difference between C , H_v , and H_f .	Lab and technology	Add calculations of heat released during the Probeware Lauric Acid Lab on both the cooling segment ($q=mC\Delta T$) and the freezing segment ($q=mH_f$). Conduct a smartboard problem review. Students will be given 20 questions of all three types of heat calculations all mixed up. They will have to drag the correct formula to use to the question and the correct numerical value of either C, H_v, or H_f.
53-CR	29.21%	Students were asked to explain in terms of valence electrons why the bonding in 2 different compounds was similar. They did not explain in terms of valence electrons- they simply stated the type of bonding in both compounds.	Other	Students should underline when they see the phrase “<u>in terms of.....valence electrons</u>” and instructed that their answer should contain the underlined phrase. For example: “The bonding in these compounds is similar in terms of valence electrons because they both involve the transfer of valence electrons. Include more short answer questions of this type on unit exams.
77-CR	28.69%	Students thought the lower the pH the lower the hydrogen ion concentration. Do not understand the inverse relationship.	Lab and Technology	GEMS Alien Juice Bar- 3 separate on line activities http://sv.berkeley.edu/showcase/flash/juicebar.html • Challenge #1 Learn about acids and bases • Challenge #2 Identifying acids and bases • Challenge #3 Learn about the pH scale Great site that relates pH and H^+ concentration is http://www.johnkryk.com/pH.html

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58-CR	25.75%	Students did not go to reading passage to figure out the formula for acetamide. Students do not know the definition of “structural formula”	Lab and Other	Literacy Activity with Reading Passages: Teacher breaks down the question into a series of questions and cues students where to look for the answer. (See attached example for this question) Organic Chemistry Lab using Molecular Models
59-CR	24.05%	There are three equations to calculate heat in the reference tables. Students used wrong equation ($q=mC\Delta T$). Students do not know when to use what formula and do not know the difference between C , H_v , and H_f .	Lab and technology	Add calculations of heat released during the Probeware Lauric Acid Lab on both the cooling segment ($q=mC\Delta T$) and the freezing segment ($q=mH_f$). Conduct a smartboard problem review. Students will be given 20 questions of all three types of heat calculations all mixed up. They will have to drag the correct formula to use to the question and the correct numerical value of either C, H_v, or H_f
7-MC	24.01%	Students are confused about the movement of electrons and when energy is absorbed or released.	Technology and Lab	Show simulations of electron movement and spectrum production. http://www.colorado.edu/physics/2000/quantumzone/ http://www.colorado.edu/physics/2000/quantumzone/bohr.html http://www.mhhe.com/physsci/chemistry/essentialchemist/ry/flash/linesp16.swf http://wps.prenhall.com/wps/media/objects/4974/5093961/emediac/ch07/FlameTestsforMetals.html Atomic Spectrum Lab

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55-CR	22.64%	Students are used to writing the excited state configuration of an atom when given the ground state configuration. This question asked for the opposite. Many students probably just wrote another excited state configuration.	Technology	Using the atom builder in the smartboard gallery have students create “ground state” and “excited state” atoms. Have them complete the atomic number and determine the atom. This will allow them to see the differences in the atoms and the relationships between the vocabulary words.
36-MC	22.00%	Students do not know the difference between molecular and empirical formulas.	Other/Technology	Provide students with a card when they come in that contains either a molecular formula or the reduced empirical formula that matches. Have students find their match. Provide one student with a compound that has the same molecular and empirical formula (H_2O). Have students generate their own definitions for the terms and have them come up with 4 more examples of molecular formulas with the reduced empirical formula and then two examples of substances that have the same molecular and empirical formula. (Can use smartboard tiles as well for a concentration type matching game- students have to match the molecular formula to the empirical formula)
75-CR	21.45%	Students do not recognize this as a law of conservation of matter calculation.	Demo	Perform a demonstration in a closed container involving the reaction of baking soda and vinegar. Provide students with the mass of the baking soda and the vinegar and have them predict the mass of the product. Provide follow up questions in which the unknown mass is varied between the reactants and products.

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80-CR	20.44%	Students did not go to the reading passage to get the IUPAC name of cuprite. Students did not recognize that the given the name copper (I) oxide the roman numeral represents the charge on copper.	Technology	On-line interactive naming and formula writing practice.- Refer to Unit 4- Conservation of matter- there are a variety of on-line naming and formula writing activities: http://www.sciencegeek.net/Chemistry/taters/directory.shtml Quia also has a variety of games and on-line activities for naming. http://www.quia.com/jg/396811.html
82-CR	20.25%	Students did not recognize that they simply needed to write down a generic property of metals. They thought they needed to know specific properties of the element copper. Students get overwhelmed by the reading passage	Other	Literacy Activity with Reading Passages: Teacher breaks down the question into a series of questions and cues students where to look for the answer. (See attached example for this question)