DeAnza College **SLO ARCHIVE**

Student Learning Outcomes for CHEM 50

Preparation Course for General Chemistry

Team Members:

Team Leader:
Ram Subramaniam (8517) in CHEM

Other members:

1. Ram Subramaniam (x8517) CHEM

Additional team members/notes about team:

Ram Subramaniam,

Additional Notes:

Outcomes:

Outcome 1 Phase I: Statement

Assess the fundamental concepts of modern atomic and molecular theory.

Outcome 1 Phase II: Assessment Strategy Used:

Assessment Quarter: Spring 2010
Assessors: , Cinzia Muzzi
Assessment Tools: *No tools assigned*.
Sections being assessed: 01, 02

Outcome 1 Phase III: Reflect & Enhance

Number of people involved in Phase III: 6

Changes:

Methods:
The following questions from the final exam were used to assess this outcome:1. How many neutrons are in the nucleus of an atom of 6027 Co?2. What is the molecular shape of NH¬3?

Findings and Conclusions:
Results from question 1:Number of Responses: 37Number of Correct: 19Number of Incorrect:18Average % Correct: 51.4%Results from question 2:Number of Responses: 37Number of Correct: 25Number of Incorrect:12Average % Correct: 67.6%

Enhancement (Planned Actions)
Part I:

Part II:

Outcome 2 Phase I: Statement

Evaluate the standard classes of chemical reactions.

Outcome 2 Phase II: Assessment Strategy Used:

Assessment Quarter: Spring 2010
Assessors: , Cinzia Muzzi
Assessment Tools: *No tools assigned*.
Sections being assessed: 01, 02

Outcome 2 Phase III: Reflect & Enhance

Number of people involved in Phase III: 6

Changes:

Methods:
The following questions from the final exam were used to assess this outcome:1. What are the predicted products from the following neutralization reaction?2. What is the formula of the predicted product from heating magnesium metal and nitrogen gas?

Findings and Conclusions:
Results from-Question 1:Number of Responses: 37Number of Correct: 21Number of Incorrect:16Average % Correct: 56.8%Question 2:Number of Responses: 37Number of Correct: 34Number of Incorrect: 3Average % Correct: 91.9 %

Enhancement (Planned Actions)
Part I:

Part II:

Outcome 3 Phase I: Statement

Demonstrate a fundamental understanding of mathematical concepts pertaining to chemical experimentation and calculations.

Outcome 3 Phase II: Assessment Strategy Used:

Assessment Quarter: Spring 2010
Assessors: , Cinzia Muzzi
Assessment Tools: *No tools assigned*.
Sections being assessed: 01, 02

Outcome 3 Phase III: Reflect & Enhance

Number of people involved in Phase III: 6

Changes:

Methods:
The following questions from the final exam were used to assess this outcome:1. How many moles of helium occupy a volume of 5.00L at 227.0ºC and 5.00 atm?2. If 37.5 mL of 0.100 M calcium chloride reacts completely with aqueous silver nitrate, what is the mass of AgCl (143.32g/mol) precipitate?

Findings and Conclusions:
Results from the outcome assessments:Question 1:Number of Responses: 37Number of Correct: 16Number of Incorrect: 21Average % Correct: 43.2 %Question 2: Number of Responses: 37Number of Correct: 28Number of Incorrect: 9Average % Correct: 75.7%

Enhancement (Planned Actions)
Part I:
The national success rate in chemistry (based on data from nsf.gov and acs.org) is between 65-70%. The assessment data of the outcomes for this chemistry class indicates that the performance of De Anza College chemistry students is at or above the national average. While this is encouraging, we feel that there is scope for further improvement. Since this is a “preparation” class for General Chemistry course sequence, our experience has been that, those students who simply meet the minimum required performance standards in this class are having difficulties in the General Chemistry sequence. The primary methods by which we can elevate student performance to far above average standards would be: 1) by providing students greater support via tutorials/recitations and education about study skills; and 2) by providing students a better laboratory experience by tying in the lab experiences more closely with the lecture.

Part II:
Both of the methods indicated in Part I to improve student performance will require considerable additional resources, which we currently lack. While the tutorial center provides students with an opportunity for drop-in tutoring; the number of tutors available is a small number compared to the total number of students enrolled in this class. Additionally, the tutorial center is not equipped to provide students with guidance regarding study skills, or strategies for being successful in chemistry (and sciences in general).Based on our assessment of a different chemistry class (Chem 1B) in which the lecture and laboratory are extremely well coordinated, we concluded that laboratory experiences that closely parallel material discussed in the lecture is essential for students to be successful in

chemistry. The limiting factor in having a highly challenging and exceptional laboratory program is primarily due to limitations in resources. Specifically, the staffing situation in our laboratories is sub-par; we have one staff member undertaking the responsibilities of three entirely different positions (stockroom manager, hazardous waste manager, laboratory coordinator). Changes to our laboratory curriculum involve a great deal of planning: developing new laboratory experiments, ordering required chemicals and other supplies, writing a new laboratory manual, creating waste labels, organizing different necessary equipment, training student workers in appropriate laboratory preparations, just to name a few. All of these tasks require large investments of time from both the faculty and the single stockroom full-time personnel. While the faculty may be able to develop new and interesting laboratory experiments, it is impossible to implement these without complete synergy with the (lone) stockroom personnel. Students will greatly benefit from a richer laboratory experience, and this is likely to lead to a much improved accomplishment and success of the learning outcomes. However, due to limitations in resources such projects are currently purely theoretical concepts.

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