Sample Closing the Loop

Chemistry

Outcome 1	Measureable Criteria	Measurement Tool	Courses	Time Frame
Utilize knowledge of **chemical structure** to predict and explain the physical properties of chemical materials.	An average score of at least 80% or better on homework and 70% or better on homework and exam questions relating to **chemical structure**.	Homework, Exams	CHEM 110 CHEM 221 CHEM 222 CHEM 223	Data collection begins: 2015-2016 Analysis begins: 2016-2017

2015-2016 Results:

CHEM 221 – FL15	Average		Average		Average
HW Chp. 1	N/A	HW Chp. 7	87%	Exam 1	79%
HW Chp. 2	96%	HW Chp. 8	93%	Exam 2	70%
HW Chp. 3	N/A	HW Chp. 9	86%	Final Exam	
HW Chp. 4	N/A	HW Chp. 10	90%		

CHEM 110 – FL15	Average		Average		Average
HW Chp. 2	91%	HW Chp. 8	79%	Exam 1	80%
HW Chp. 3	97%	HW Chp. 17		Exam 2	57% (n=1)
HW Chp. 5	84%	HW Chp. 19		Final Exam	
HW Chp. 6	N/A	HW Chp. 21			

Analysis:
CHEM 221   **CHEM 110**
Homework: 90%, Exams: 75%   Homework: 88%, Exams: 69%

Plan:
I will continue to examine my teaching methodologies and exam and homework questions to improve these numbers.

Further, although students have met my standards, it is difficult to know whether they have met national standards. To compare student achievement in my courses to student achievement in General Chemistry courses nation-wide, I plan to administer an American Chemical Society approved exam for general chemistry at the conclusion of CHEM 223.

Outcome 1	Measureable Criteria	Measurement Tool	Courses	Time Frame
Utilize knowledge of **chemical structure** to predict	**CHEM 110/GS 105/CHEM 221:** at least 75% achieve "emerging proficiency"	Homework, Exams,	GS 105 CHEM 110 CHEM 221	Data collection begins: WT17

and explain the physical properties of chemical materials.	**CHEM 222:** at least 75% achieve "marginal proficiency" **CHEM 223:** at least 75% achieve "developed proficiency" **CHEM 245/246/247:** at least 75% achieve "exemplary proficiency"	Chemical structure rubric	CHEM 222 CHEM 223 CHEM 245 CHEM 246 CHEM 247	Analysis begins: SP17

2016-2017 winter Results:

CHEM 246 GOAL:	WT17 RESULTS:
At least 75% of students achieve at least "exemplary proficiency"	**100%** of students achieved at least "exemplary proficiency"

■ Exemplary Proficiency   ■ Developed Proficiency   ■ Marginal Profiency   ■ Emerging Proficiency   ■ Lacks Demon Proficie

WINTER 2017   CHEM 110

Rubric View: Chemical Structure Rubric

	Exemplary Proficiency (4 pts)	Developed Proficiency (3 pts)	Marginal Profiency (2 pts)	Emerging Proficiency (1 pts)	Lacks Demonstrated Proficiency (0 pts)	Mean	Mode	Stdev
Electronic Structure	0	0	21	0	2	1.826	2.000	0.564
Molecular Geometry	0	0	0	20	3	0.870	1.000	0.337
Spectroscopic Analysis	0	0	0	0	0	0.000	NA	0.000

Electronic Structure *std_text*: 21 (91%) 2 (8%)

Molecular Geometry *std_text*: 20 (86%) 3 (13%)

Spectroscopic Analysis *std_text*:

CHEM 110 GOAL:	WT
At least 75% of students achieve at least "emerging proficiency"	88. ach "er

Rubric View: Chemical Structure Rubric   CHEM 246

	Exemplary Proficiency (4 pts)	Developed Proficiency (3 pts)	Marginal Profiency (2 pts)	Emerging Proficiency (1 pts)	Lacks Demonstrated Proficiency (0 pts)	Mean	Mode	Stdev
Electronic Structure	3	0	0	0	0	4.000	4.000	0.000
Molecular Geometry	3	0	0	0	0	4.000	4.000	0.000
Spectroscopic Analysis	0	0	3	0	0	2.000	2.000	0.000

Electronic Structure *std_text*: 3 (100%)

Molecular Geometry *std_text*: 3 (100%)

Spectroscopic Analysis *std_text*: 3 (100%)

Rubric View: Chemical Structure Rubric   **GS 105**

	Exemplary Proficiency (4 pts)	Developed Proficiency (3 pts)	Marginal Profiency (2 pts)	Emerging Proficiency (1 pts)	Lacks Demonstrated Proficiency (0 pts)	Mean	Mode	Stdev
Electronic Structure	0	17	2	0	0	2.895	3.000	0.307
Molecular Geometry	0	0	17	2	0	1.895	2.000	0.307
Spectroscopic Analysis	0	0	0	0	0	0.000	NA	0.000

Electronic Structure std_text	17 (89%) 2 (10%)
Molecular Geometry std_text	17 (89%) 2 (10%)
Spectroscopic Analysis std_text	

RESULTS: 100% of students in both CHEM 246 and GS 105 achieved the desired level of performance in the categories of chemical structure. 88.5% of students in CHEM 110 achieved the desired level of performance with regards to chemical structure.

ANALYSIS: Although a majority of students scored at the desired level of performance in this exercise, I believe that there is more work to be done. I do believe that these data reflect the true abilities of my students in this category, as I have been sufficiently impressed with their understanding of chemical structure. However, the data seem to indicate that nearly all of the students in the course are achieving at the same level; I do not necessarily believe this result. I think that the problem lies within the chemical structure rubric; if it were designed more carefully, it could be used to investigate these differences in abilities between students in the same course, even if they are achieving at the desired performance level.

PLAN: This initial assessment is promising, but I believe that students can perform even better in this area. I will take another look at the "chemical structure rubric" to see if I can change the wording of each category to better match student performance and to better tease out small differences in performance among students in the same course. Another possibility is to increase the measurable criteria for this outcome; rather than expecting 75% to perform better than "marginal proficiency", perhaps I should expect 75% to perform at or better than "developed proficiency".