Quantitative Reasoning (Math Competency)
Institutional Learning Outcome Assessment

Los Angeles Mission College
October 2018

Los Angeles Mission College (LAMC) conducted an assessment of the Quantitative Reasoning (Math Competency) Institutional Learning Outcome (ILO) during the 2017-18 academic year.

The ILO states: *Students will demonstrate quantitative reasoning by identifying relevant data (numerical information in mathematical or other contexts), selecting or developing models appropriate to the problem which represents the data (organized representations of numerical information, e.g., equations, tables, graphs), obtaining and describing results and drawing inferences from data. Evidence will be the ability to extract appropriate data from a problem, to arrange data into tables and graphs or to select or set up an equation or formula, to obtain correct results, to describe trends and features in those results and to make predictions or estimates while drawing qualitative conclusions about the original situation.*

The benchmark for this ILO is: *70% of the students will achieve an acceptable score or better*.

Among the 320 assessments completed, 276 or 86 percent were rated acceptable or above. Thus, the 70 percent benchmark for this ILO was achieved.

Number of Assessments	Acceptable or Above	% Acceptable or Above	Benchmark Achieved
320	**276**	**86.3%**	☑

The methodology used to assess the ILO this year consisted of authentic class assessments that were aggregated across different disciplines and course sections. Course sections with at least one supporting SLO were invited to participate by conducting an individual, course-specific assessment (see Appendix A) that was rated according to a common rubric developed by the ILO Subcommittee (see Appendix B). Rubric results were then aggregated and are summarized in this report. If a course had more than one supporting SLO, each SLO was assessed separately according to the shared rubric. Thus, some students were assessed more than once.

The rubric included the following three criteria:

- Identifying Relevant Data or Information,
- Selecting or Developing an Appropriate Model or Theory,
- Obtaining Results from the Model, or Drawing Inferences.

A rating scale from one to five was assigned as follows: 5 points for "Excellent," 4 points for "Good," 3 points for "Acceptable," 2 points for "Below Average," and 1 point for "Unacceptable" (see Appendix B).

The following twelve class sections from ten different courses participated in the assessment during spring 2018:

Course	Number of Sections	Enrolled Students	SLOs Assessed	Number of Assessments
ACCTG 002: Introductory Accounting II	1	29	1	9
ASTRON 005: Fundamentals of Astronomy Laboratory	1	26	2	23
CHEM 101: General Chemistry	1	54	1	45
CHEM 212: Organic Chemistry	1	13	1	11
CO SCI 440: Programming in C++	1	28	3	66
CO SCI 452: Programming in Java	1	26	2	22
MATH 227: Statistics	3	114	1	63
PHYSICS 039: Physics for Engineers & Scientists III	1	16	1	14
SOC 004: Sociological Analysis	1	25	2	34
SOC 028: The Family: A Sociological Approach	1	40	1	33
TOTAL	**12**	**371**	**15**	**320**

Disaggregated Assessment Results

The percentage of "acceptable or above" assessments is disaggregated by gender, ethnicity, age group, unit load in Spring 2018, and total cumulative units in the table below. As mentioned above, due to some sections assessing multiple SLOs that map to this ILO, the same student may be counted more than once below. Subcategories with fewer than 30 assessed students have been grayed out in the tables below and should not be used as a basis for decision-making. Due to rounding, percentages may not total 100.0%.

Normalized scores are used to compare results across rubrics with different scales, including those used in other ILO assessments. The normalized score scale runs from 1.00 to -1.00, with zero indicating the minimum acceptable score. A positive number indicates performance above "acceptable" and a negative number indicates "unacceptable." Larger positive numbers indicate better performance, and larger negative numbers indicate worse performance.

Female and male students scored equally well (86 percent scored acceptable or above). Slightly more women scored exemplary with an average normalized score of 0.52 as compared with 0.49 for men.

While 86 percent of Hispanic students assessed scored acceptable or above, this high score is still below that of White students, 97 percent of whom scored acceptable or above. Furthermore, a higher proportion of White students scored exemplary than Hispanic students. White students had an average normalized score of 0.67, as compared with 0.47 for Hispanic students. Other ethnicities did not have a large enough sample size for valid comparison.

Older students scored better on the assessment than traditional college age students. Students who were between the ages of 22 and 25 performed the strongest on the assessment; 91 percent achieved acceptable or above, with an average normalized score of 0.57. Slightly older students aged 26-30 also performed very well, with 85 percent achieving acceptable or above. Traditional college-age students did not score as well as the other two age groups; 80 percent achieved acceptable or above, which was still well above the benchmark.

Students who had completed 60 or more units scored better than students who had fewer than 60 units. While 89 percent of those with enough units to graduate with a degree achieved acceptable or above score, only 84 percent of those with fewer units were rated acceptable or above. The average normalized scores of both groups was similar, however.

Unit load was not a determining factor in the success of the students in this assessment. While it is theorized that full-time students may have more time to devote to study and thus may perform better, in this assessment, full-time students only fared slightly better than part-time students, with 88 percent of full-time students enrolled in 12 or more units achieving acceptable or above ratings, as compared with 85 percent of part-time students. The two groups had nearly equal average normalized scores.

	Number Assessed	% of Total	Acceptable or Above	% Acceptable or Above	Average Normalized Score
Total	**320**	**100.0%**	**276**	**86.3%**	**0.50**
Gender					
Female	131	40.9%	113	86.3%	0.52
Male	189	59.1%	163	86.2%	0.49
Ethnicity					
Hispanic	234	73.1%	199	86.1%	0.47
White	37	11.6%	36	97.3%	0.67
Asian	24	7.5%	23	95.8%	0.71
Black	7	3.0%	4	57.1%	0.21
Multiethnic	2	0.9%	1	50.0%	0.17
Unknown	16	5.0%	13	81.3%	0.51
Age					
18-21	131	40.9%	105	80.2%	0.41
22-25	116	36.3%	106	91.4%	0.57
26-30	40	12.5%	34	85.0%	0.39
31-40	21	6.6%	20	95.2%	0.82
41-50	4	1.3%	4	100.0%	0.79
Over 50	8	2.5%	7	87.5%	0.52
Unit Load					
Full-time	144	45.0%	126	87.5%	0.51
Part-time	176	55.0%	150	85.2%	0.50
Cumulative Units					
Less than 60	155	48.4%	130	83.9%	0.49
60 or more	165	51.6%	146	88.5%	0.52

Assessment Results by Discipline

The table below shows the assessment results disaggregated by discipline and course. As with the tables above, data for categories with a small number of students have low reliability and should not be used as a basis for decision-making. Due to rounding, percentages may not total 100.0%.

	Number of Assessments	% of Total	Acceptable or Above	% Acceptable or Above	Average Normalized Score
TOTAL	**320**	**100.0%**	**276**	**86.3%**	**0.50**
ACCOUNTING ACCTG 002: Introductory Accounting II	**9**	**2.8%**	**8**	**88.9%**	**0.37**
ASTRONOMY ASTRON 005: Fundamentals of Astronomy Laboratory	**23**	**7.2%**	**17**	**73.9%**	**0.33**
CHEMISTRY	**56**	**17.5%**	**43**	**76.8%**	**0.36**
CHEM 101: General Chemistry	45	14.1%	33	73.3%	0.29
CHEM 212: Organic Chemistry	11	3.4%	10	90.9%	0.64
COMPUTER SCIENCE	**88**	**27.5%**	**81**	**92.0%**	**0.60**
CO SCI 440: Programming in C++	66	20.6%	63	95.5%	0.58
CO SCI 452: Programming in Java	22	6.9%	18	81.8%	0.66
MATH MATH 227: Statistics	**63**	**19.7%**	**46**	**73.0%**	**0.15**
PHYSICS PHYSICS 039: Physics for Engineers & Scientists III	**14**	**4.4%**	**14**	**100.0%**	**0.82**
SOCIOLOGY	**67**	**20.9%**	**67**	**100.0%**	**0.83**
SOC 004: Sociological Analysis	34	10.6%	34	100.0%	0.77
SOC 028: The Family: A Sociological Approach	33	10.3%	33	100.0%	0.90

Analysis by the Instructors

Most instructors described their students as doing well on the assessment and meeting the benchmark. Criterion #3 (Obtaining Results from the Model, or Drawing Inferences) was the most difficult for students and one section did not meet the benchmark for this criterion. In addition, instructors suggested possibly raising the benchmark for the other criteria and that scaffolding courses in areas such as time management and ethics might help students score higher on the assessment. Instructor comments are given in the chart below.

ACCTG 002
Students did well under all criteria. Criteria 3 could be improved but usually caused by minor math errors or partial answers.

ASTRON 005
Students scored above the benchmark, but just barely. Criterion 3 required a more in-depth understanding of the evolution of stars, and how it relates to the diagram

CHEM 101
Criteria 1 was over the benchmark but many students were unable to properly determine the mass component of the equation. Most students understood what was needed (formula) to solve this problem and did the calculations correctly as seen by 77% above the benchmark for criteria 2. However, many students struggled with understanding the outcome should be negative and thus an exothermic reaction which is seen because the benchmark was not met for criteria 3 at 65%.

CHEM 212
Students identified appropriate data from each spectroscopy, developed parts of the structure, but had challenges distinguishing between stereoisomers of the molecule.

CO SCI 440 – Section 1
The benchmark was achieved. At this level of programming it is expected that the students do well. Approximately 15% of the students have difficulty completing the work within the time frame given for each assignment. The students understand the application of technology and the object oriented concepts however the concept of time management is lacking.

CO SCI 440 – Section 2
The benchmark was achieved. This is an advanced programming class and it is expected that the students do well. The tests given (four tests - including the final exam) show excellent understanding of the principles involved in programming, and the students give unique approaches to solving the problems presented in the assignment. The major challenge the students have is with time management. This class requires ten hours of outside work to complete the assignments.

CO SCI 440 – Section 3
The benchmark was achieved. All the students who completed the course scored acceptable or above. Approximately 30% of the students scored excellent. Parameter passing and referencing is one of the more difficult abstract concepts for the students to understand.

CO SCI 452 – Section 1
The benchmark was achieved. We should however be able to move the benchmark to a higher number. When students are understanding the concepts, their performance is consistent and get usually score 100%. When students are 'browsing' the internet for possible solutions, they tend to not understand the concepts nor be able to solve a problem with simple modification. Teaching IT courses and giving students 'original' problems to solve is narrowing down. IT courses should be between book holder courses like ethics and time management.

CO SCI 452 – Section 2
This was based on Lab 7. The students used the array data structure to store data. Print the array. Find the average of the numbers stored in the array. All using methods. Even though data shows that we exceeded the expectation, please note that most students have not yet submitted their assignment (this is week 15).

MATH 227 – Section 1
Some students struggled with providing solid interpretations of their findings even though their conclusion about the original problem was correct. For example, some students had difficulties in relating the results of hypothesis testing and confidence interval. The results overall exceeded the expected benchmark of the quantitative reasoning ILO.

MATH 227 – Section 2
Some students struggled with designing a survey that would collect appropriate data or finding relevant data online. But once they had the data, they we able to analyze and come to the correct conclusion.

PHYSICS 039
All of the students scored acceptable or above. All the students did well on identifying which equation to use and how to solve the problem. The part students struggled on was drawing logical conclusions from the equations.

SOC 004 – Section 1
Students did a good job identifying the findings and discussing the research method strengths and weaknesses. They had some challenges in applying this data to action or deciding who should be in charge of such action to reduce social problem. The benchmark was surpassed at 80%.

SOC 004 – Section 2
Most students did quite well with this assignment especially in the ability to follow the research method procedures and using evidence to draw their findings or conclusions. Some students had a harder time organizing their data into proper charts, even though they were given a sample chart. Most of the errors had to do with organization of the research method which combined both qualitative and quantitative data. The benchmark was reached at 75%.

SOC 028
Students were very successful in identifying that age, social class and education level impacted relationship success. They had a harder time with making inferences based on the data charts. However, overall they were quite successful in this assessment probably because these variables were connected to multiple chapters in the course. Benchmark was exceeded at 90%.

Assessment Results by Criterion

Criterion	Number of Assessments	Acceptable or Above	% Acceptable or Above	Average Rubric Score (out of 5.0)
1) Identifying Relevant Data or Information	320	285	89.1%	4.2
2) Selecting or Developing an Appropriate Model or Theory	320	283	88.4%	4.1
3) Obtaining Results from the Model, or Drawing Inferences	320	257	80.3%	3.7

Criterion 1: Identifying Relevant Data or Information	Number of Assessments	Acceptable or Above	% Acceptable or Above	Average Rubric Score (out of 5.0)
TOTAL	**320**	**285**	**89.1%**	**4.2**
ACCOUNTING ACCTG 002: Introductory Accounting II	**9**	**7**	**77.8%**	**4.0**
ASTRONOMY ASTRON 005: Fundamentals of Astronomy Laboratory	**23**	**20**	**87.0%**	**4.5**
CHEMISTRY	**56**	**44**	**78.6%**	**3.8**
CHEM 101: General Chemistry	45	34	75.6%	3.6
CHEM 212: Organic Chemistry	11	10	90.9%	4.5
COMPUTER SCIENCE	**88**	**85**	**96.6%**	**4.3**
CO SCI 440: Programming in C++	66	63	85.5%	4.2
CO SCI 452: Programming in Java	22	22	100.0%	4.5
MATH MATH 227: Statistics	**63**	**48**	**76.2%**	**3.6**
PHYSICS PHYSICS 039: Physics for Engineers & Scientists III	**14**	**14**	**100.0%**	**5.0**

SOCIOLOGY	**67**	**67**	**100.0%**	**4.8**
SOC 004: Sociological Analysis	34	34	100.0%	4.7
SOC 028: The Family: A Sociological Approach	33	33	100.0%	4.9

Criterion 2: Selecting/Developing an Appropriate Model or Theory	**Number of Assessments**	**Acceptable or Above**	**% Acceptable or Above**	**Average Rubric Score (out of 5.0)**
TOTAL	**320**	**283**	**88.4%**	**4.1**
ACCOUNTING ACCTG 002: Introductory Accounting II	**9**	**7**	**77.8%**	**4.0**
ASTRONOMY ASTRON 005: Fundamentals of Astronomy Laboratory	**23**	**17**	**73.9%**	**3.6**
Criterion 2: Selecting/Developing an Appropriate Model or Theory (cont.)	**Number of Assessments**	**Acceptable or Above**	**% Acceptable or Above**	**Average Rubric Score (out of 5.0)**
CHEMISTRY	**56**	**46**	**82.1%**	**4.0**
CHEM 101: General Chemistry	45	36	80.0%	3.9
CHEM 212: Organic Chemistry	11	10	90.9%	4.5
COMPUTER SCIENCE	**88**	**82**	**93.2%**	**4.2**
CO SCI 440: Programming in C++	66	63	85.5%	4.1
CO SCI 452: Programming in Java	22	19	86.4%	4.3
MATH MATH 227: Statistics	**63**	**50**	**79.4%**	**3.4**
PHYSICS PHYSICS 039: Physics for Engineers & Scientists III	**14**	**14**	**100.0%**	**5.0**
SOCIOLOGY	**67**	**67**	**100.0%**	**4.7**
SOC 004: Sociological Analysis	34	34	100.0%	4.4
SOC 028: The Family: A Sociological Approach	33	33	100.0%	4.9

Criterion 3: Obtaining Results from the Model, or Drawing Inferences	**Number of Assessments**	**Acceptable or Above**	**% Acceptable or Above**	**Average Rubric Score (out of 5.0)**
TOTAL	**320**	**257**	**80.3%**	**3.7**
ACCOUNTING ACCTG 002: Introductory Accounting II	**9**	**6**	**66.7%**	**3.2**
ASTRONOMY ASTRON 005: Fundamentals of Astronomy Laboratory	**23**	**11**	**47.8%**	**2.9**
CHEMISTRY	**56**	**43**	**76.8%**	**3.4**
CHEM 101: General Chemistry	45	33	73.3%	3.3

CHEM 212: Organic Chemistry	11	10	90.9%	3.8
COMPUTER SCIENCE	**88**	**81**	**92.0%**	**4.2**
CO SCI 440: Programming in C++	66	63	95.5%	4.2
CO SCI 452: Programming in Java	22	18	81.8%	4.2
MATH MATH 227: Statistics	**63**	**40**	**63.5%**	**2.9**
PHYSICS PHYSICS 039: Physics for Engineers & Scientists III	**14**	**9**	**64.3%**	**3.9**
SOCIOLOGY	**67**	**67**	**100.0%**	**4.5**
SOC 004: Sociological Analysis	34	34	100.0%	4.4
SOC 028: The Family: A Sociological Approach	33	33	100.0%	4.6

Comparison of Assessed Students to Overall Student Body

The table below compares the demographic breakdown of assessed students with that of the overall student body. As noted earlier, some students were assessed more than once, either in the same course section for different supporting SLOs, or across multiple courses, and are counted more than once in the "number assessed" below.

	Number Assessed	% of Total	Spring 2018 Student Body
Total	**320**	**100.0%**	**9,954**
Gender			
Female	131	40.9%	61.0%
Male	189	59.1%	39.0%
Ethnicity			
Hispanic	234	73.1%	73.9%
White	37	11.6%	9.7%
Asian	24	7.5%	4.6%
Black	7	3.0%	3.0%
Multiethnic	2	0.9%	1.0%
Other/Unknown	16	5.0%	7.8%
Age			
Under 18	0	0.0%	13.9%
18-21	131	40.9%	36.4%
22-25	116	36.3%	19.7%
26-30	40	12.5%	11.7%
31-40	21	6.6%	9.4%
41-50	4	1.3%	5.0%
Over 50	8	2.5%	3.9%

While the ethnic breakdown of the assessed sample matched that of the student body quite closely, the gender ratio was reversed in the assessed sample. This may be due to the primarily STEM-related subjects assessed, which are more popular among men.

The assessed sample included a higher proportion of older students than are in the overall student body. This is to be expected as the ILO assessments are meant to assess whether a student has achieved the desired skills by the time they graduate, and more advanced courses are chosen for assessment. These courses are likely to have an older median age than introductory courses.

Summary and Future Steps

Overall, the 70 percent benchmark for this Institutional Learning Outcome (ILO) was achieved by all course sections assessed and for all demographic groups with a large enough sample size to provide reasonably valid data. The College performed quite a bit above the benchmark, with 86 percent of assessments rated as acceptable or above.

It does appear that students who have completed 60 or more cumulative units scored better on the assessment than those with fewer than 60 units. About 84 percent of those with fewer than 60 units scored acceptable or above on the assessment while 89 percent of those with 60 or more units scored acceptable or above. The average normalized scores were similar for both groups, with the 60 or more unit group achieving slightly more exemplary scores at 0.52, as compared with 0.49 for the under 60 unit group.

Thus, we can conclude that Los Angeles Mission College is fulfilling its commitment to teach students to extract appropriate data from a problem, to arrange data into tables and graphs or to select or set up an equation or formula, to obtain correct results, to describe trends and features in those results and to make predictions or estimates while drawing qualitative conclusions about the original situation.

When disaggregating the data by gender, we did not find an equity gap as both women and men performed equally well. However, it should be noted that the sample of female students comprised only 41 percent of total students assessed, which is much lower than their representation in the College at large, which is 61 percent.

Hispanic and White were the only two ethnic groups for which we had a large enough sample size to provide valid data for analysis by ethnicity. While the ethnic breakdown of the students in the sample matches that of the overall student body, the fact that the student body is three-quarters Hispanic requires a much larger sample size than this assessment was able to achieve in order for the less-represented ethnicities to meet the minimum sample size of 30 students.

86 percent of Hispanic students assessed scored acceptable or above. While this is a high score and well above the 70 percent benchmark, Hispanic students nevertheless scored quite a bit lower than White students, 97 percent of whom scored acceptable or above. Furthermore, a comparison of the normalized scores of both groups shows that a higher proportion of White students scored exemplary than among Hispanic students (0.67 for Whites vs. 0.47 for Hispanics). Thus, there appears to be an equity gap for Hispanic students with regard to this ILO.

Among the three rubric criteria assessed, students performed very well on identifying relevant data or information and on selecting or developing an appropriate model or theory (with about 89 percent of students scoring acceptable or above on these two criteria), but less well on the third criterion of obtaining results from the model or drawing inferences (only 80 percent scored acceptable or above). More instruction may be needed focusing on this aspect of quantitative reasoning.

The results of this assessment were discussed during Learning Outcomes Assessment Committee (LOAC) meetings, as well as during Academic Senate meetings, and shared with the campus at large during the annual SLO Summit.

One of the methodological issues that came up during the analysis phase of this assessment is the question of how to weight multiple SLOs from a single course section. Since all course sections with at least one SLO that supported the ILO were invited to participate in this assessment, four participating courses had more than one supporting SLO, including one course which had three supporting SLOs. In this report, the decision was made to weigh all assessments equally. However, this resulted in the courses with more than one supporting SLO being weighted more heavily in the overall results. In the future, this issue will be addressed ahead of time during the assessment design phase to decide whether it is necessary to limit each assessed course to one supporting SLO and how to weight multiple assessments of the same student.

This assessment also encountered some of the same roadblocks experienced in previous authentic ILO assessments, namely the difficulty in reaching a broad base of students across a variety of disciplines and course sections to truly represent instruction on quantitative reasoning across the institution. While seven disciplines were represented in the assessment, the participating courses (and hence number of students assessed in each discipline) did not mirror student enrollment in those disciplines across the College, with Computer Science being overrepresented and Math being significantly underrepresented. In addition, some participating class sections had fewer than 30 students enrolled. In some cases, those class sections represented an entire discipline in the assessment, but due to the small sample size, we were unable to make conclusions by discipline based on the data obtained. Moving forward, a concerted effort should be made to ensure that a representative sample of courses from each department is included.

While extensive efforts were made to contact Department Chairs and individual faculty for participation, ultimately faculty participation is completely voluntary and uncompensated. Methodology for future assessments will include a greater frequency of reminders and contact via email and announcements in various committee meetings as well as attempts to incentivize greater faculty participation.

Appendix A: Assessment Method Description

ACCTG 002
Computational Problem designed to assess quantitative reasoning.
ASTRON 005
Use question 26 from Final Exam to evaluate analysis of graph
CHEM 101
Two part question that requires problem analysis, use of formulas, and quantitative solving ability applied to a Chemistry process involving a bomb calorimeter. This question was provided on the lecture final exam.
CHEM 212
Deduce a structure of a molecule based on spectroscopic data/spectrum, such as mass and infrared spectroscopy, proton and carbon nuclear magnetic resonance.
CO SCI 440
Students are given a minimum of three problems every week. These problems require that the students use the analysis skills for applying programming logic to selection, decision, and repetition structures. Students are given problems that require parameter passing between modules and multiple forms throughout the semester. In the final exam, students are required to create classes and class member functions that use pointers to reference multiple parameters.
CO SCI 452
Labs assigned to students during the semester. Used Lab 10 - the students defined the Class Integer, its attributes and methods.
MATH 227
Students were required to submit a project where they perform a real-world data analysis: describing the problem, collecting, summarizing, analyzing the data, and drawing inferences by performing a hypothesis testing and constructing a confidence interval on comparing two population parameters of their choice.
PHYSICS 039
Using Quiz Question #1 for ILO assessment.
SOC 004
Students used current sociological research, analyzed and summarized findings and discuss research method used. Also discussed how this research could be put to action to reduce the social problem being studied.
SOC 028
Students used current sociological research to analyze charts with data to determine which variables impacted relationship success or divorce. Students also had to make inferences based on that data and plan for action to reduce the problem.

Appendix B: Rubric

Excellent (5 pts)	Good (4 pts)	Acceptable (3 pts)	Below Average (2 pts)	Unacceptable (1)
Criteria 1: Identifying Relevant Data				
Student identifies or extracts the appropriate quantitative data arranging it in an organized fashion (e.g. table, graph) that is most relevant to the problem.	Student identifies or extracts relevant quantitative data in order to solve the problem, but may not have organized information adequately, or does not include all data that may be relevant to the problem.	Student identifies the data adequate to solving the most important component of the problem	Student does not identify or extract all key data relevant to the problem.	Student does not identify any appropriate quantitative data relevant to the problem.
Criteria 2: Selecting or Developing an Appropriate Model or Theory				
Student selects or develops the best formula, algorithm, equation or theory that models or applies to the given problem or data.	Student selects or develops formula, algorithm, equation or theory that is somewhat applicable to the given problem or data.	Student selects an adequate formula, equation, or theory that models or applies to the problem or data.	Student selects an inadequate formula, equation, or theory that models or applies to the problem or data.	Student does not develop any formula, algorithm, equation or theory that models or applies to the problem or data.
Criteria 3: Obtaining Results from Model or Drawing Inferences				
Student obtains correct results, and uses these to describe trends, or makes predictions or estimates while drawing conclusions about the original problem.	Student obtains correct results, and uses these to describe trends, or make prediction but may not draw conclusions about the original problem.	Student obtains acceptable results, and uses these to describe some trends, or draw valid conclusions.	Student obtains inadequate results or does not draw valid conclusions.	Student obtains incorrect results and none of the trends or predictions are valid.