Clovis Community College
Core Competencies Assessment 2014-2015—Area III: Laboratory Science
Class: Biology 113 – Biology for General Education **Faculty: Anne Luna**
Common Core No.: NMCCN BIOL 1114

Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**
1. Students will describe the process of scientific inquiry. Students should: a. Understand that scientists rely on evidence obtained from observations rather than authority, tradition, doctrine, or intuition. b. Students should value science as a way to develop reliable knowledge about the world.	Students work through problems via the Scientific Method and correlate historical scientific investigations to important concepts in Biology (pre- and post- test taken by 72 students in the spring semester)	In-class student work showed improvement during the course in their in-class exercises, problem sets, lab activities, and current biology topics. On the exit assessment test, students results were as follows: Comp. 1 = 91% (up from 90% last year)	We used a minimum of 70% for each competency as the standard that we aspired to reach and we exceeded that goal in each of the five competencies. All of the competencies surpassed the minimum and we feel quite confident that these competencies are being taught to the students. Starting next semester, we will emphasize the difference between quantitative and qualitative data. Students will also work to distinguish between results/data from their conclusions (interpreting their results).
2. Students will solve problems scientifically. Students should: a. Be able to construct and test hypotheses using modern lab equipment (such as microscopes, scales, computer technology) and appropriate quantitative methods. b. Be able to evaluate isolated observations about the physical universe and relate them to hierarchically organized explanatory frameworks (theories).	The scientific method is used by students to solve problems and make observations using tools such as microphones, electronic scales, Punnett Squares, hypothesis are constructed and tested through lab reports , problem sets, quizzes and lecture exams.	Comp. 2 = 90% correct (up from 89%)	

Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**
3. Students will communicate scientific information. Students should: Communicate effectively about science (e.g., write lab reports in standard format and explain basic scientific concepts, procedures, and results using written, oral, and graphic presentation techniques.)	Students communicate effectively about science through lab reports , Biology in the news (current events) and in-class presentations	Comp. 3 = 87% (down from 85%)	
4. Students will apply quantitative analysis to scientific problems. Students should: a. Select and perform appropriate quantitative analyses of scientific observations. b. Show familiarity with the metric system, use a calculator to perform appropriate mathematical operations, and present results in tables and graphs.	Students perform calculations involving metrics, plant growth, energy, populations, and genetics through lab reports , problem sets, quizzes and lecture exams.	Comp 4 = 83% (down from 87%)	

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Competencies (Learning Outcomes Being Measured)	Assessment Procedures (Process/Instrument named or described – rubric attached)	Assessment Results	How Results Will Be Used To Make Improvements
5. Students will apply scientific thinking to real world problems. Students should: a. Critically evaluate scientific reports or accounts presented in the popular media. b. Understand the basic scientific facts related to important contemporary issues (e.g., global warming, stem cell research, cosmology), and ask informed questions about those issues. End – Laboratory Science	Students critically evaluate current developments in biology, incorporating basic scientific fats to make their evaluation through Biology in the news, in-class presentations and class discussions A final assessment quiz that has specific ties to each of the five competencies is given at the end of the semester	Comp. 5 = 92% correct (down from 97% last year)	

Faculty Member Completing Assessment: Anne Luna **Date: 9/15/15**

Reviewed by: Todd Kuykendall **Date: 9/15/15**
(Division chair)

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Clovis Community College
Core Competencies Assessment 2014-2015—Area III: Laboratory Science

Class: Human Biology and Lab 115 **Faculty: Meredith Arth**

Common Core No.: NMCCN BIOL 1124

Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**
1. Students will describe the process of scientific inquiry. Students should: a. Understand that scientists rely on evidence obtained from observations rather than authority, tradition, doctrine, or intuition. b. Students should value science as a way to develop reliable knowledge about the world.	Students investigate many examples in which scientists have developed reliable knowledge about the human body through class exercise, quizzes, lab activates, discussions, and lecture exams. A post- Test was given to evaluate students and determine the percentages provided.	Fall 2014 = 73% Spring 2015= 78% Students work showed satisfactory results as indicated by meeting our desired minimum score of 70%	A minimum of 70% correct for each competency was used as the standard that we aspire to reach. During the Fall 2014 all of the competency goals were met. During the Spring of 2015, 4 out of 5 were met. The competency involving quantitative analysis was the lower than expected. Next year more effort will be put into make sure the students understand the calculations that they are being asked to do.
2. Students will solve problems scientifically. Students should: a. Be able to construct and test hypotheses using modern lab equipment (such as microscopes, scales, computer technology) and appropriate quantitative methods. b. Be able to evaluate isolated observations about the physical universe and relate them to hierarchically organized explanatory frameworks (theories).	Students used current information to evaluate theories of Anatomy and Physiology in humans. Labs reports quizzes and lecture exams were used to assess the courses.	Fall 2014 = 71% Spring 2015= 73% Students work showed satisfactory results as indicated by meeting our desired minimum score of 70%	

Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**
3. Students will communicate scientific information. Students should: Communicate effectively about science (e.g., write lab reports in standard format and explain basic scientific concepts, procedures, and results using written, oral, and graphic presentation techniques.)	Students submit lab reports on current A&P information and topics.	Fall 2014 = 87% Spring 2015= 85% Students work showed satisfactory results as indicated by meeting our desired minimum score of 70%	
4. Students will apply Quantitative analysis to scientific problems. Students should: a. Select and perform appropriate quantitative analyses of scientific observations. b. Show familiarity with the metric system, use a calculator to perform appropriate mathematical operations, and present results in tables and graphs.	Students perform calculations involving heart rate, nerve receptors and reflexes. Charts graphs, and lab reports are used.	Fall 2014 = 70% Spring 2015= 65% Students work showed satisfactory results as indicated by meeting our desired minimum score of 70% for the fall semester. The spring semester was slightly lower that our stated objective of 70%.	

Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**
5. Students will apply scientific thinking to real world problems. Students should: a. Critically evaluate scientific reports or accounts presented in the popular media. b. Understand the basic scientific facts related to important contemporary issues (e.g., global warming, stem cell research, cosmology), and ask informed questions about those issues. End – Laboratory Science	Threaded discussion topics make the students apply what they have learned to actual case studies oh human anatomy and physiology	Fall 2014= 92% Spring 2015= 92% Students work showed satisfactory results as indicated by meeting our desired minimum score of 70%	

Faculty Member Completing Assessment: Meredith Arth **Date: 5/11/2015**

Reviewed by: Todd Kuykendall **Date: 5/11/2015**
(Division chair)

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Clovis Community College
Core Competencies Assessment 2014-2015—Area III: Laboratory Science
Class: Geology 113 – Physical Geology **Faculty: Harry Pomeroy**
Common Core No.: NMCCN GEOL 1114

Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**
1. Students will describe the process of scientific inquiry. Students should: a. Understand that scientists rely on evidence obtained from observations rather than authority, tradition, doctrine, or intuition. b. Students should value science as a way to develop reliable knowledge about the world.	Students will work through problem using the Scientific Method, specific historical examples will also be investigated that correlate to important concepts in Geology (e.g. – theories of geologic phenomenon, origin of the Earth) – In-class exercises, quizzes, lecture exams, labs	In-class student work showed improvement during the course in their in-class exercises, problem sets, lab activities, and discussion of current events in Geology as indicated by every one of the competencies meeting our desired minimum score of 70%. On the exit assessment test, given to 18 students during the fall and 18 students during the spring, results were as follows: **Fall** Comp. 1 = 83% **Spring** Comp. 1 = 86%	We use a minimum of 70% correct for each competency as the standard that we aspire to reach. This assessment cycle, all competences reached the benchmark compared to last assessment cycle. This increase was due to an overhaul in the assessment method. We now feel that we have a better understanding of how our students are doing in this class and we will review this assessment approach four the next couple of semesters before we make any recommendations for change.
2. Students will solve problems scientifically. Students should: a. Be able to construct and test hypotheses using modern lab equipment (such as microscopes, scales, computer technology) and appropriate quantitative methods. b. Be able to evaluate isolated observations about the physical universe and relate them to hierarchically organized explanatory frameworks (theories).	The scientific method will be used to solve problems and problems will be solved in the following areas: present is the key to the past exercises, geologic structure formation – lab reports, problem sets, quizzes, lecture exams	**Fall** Comp. 2 = 81% **Spring** Comp. 2 = 72%	

Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**
3. Students will communicate scientific information. Students should: Communicate effectively about science (e.g., write lab reports in standard format and explain basic scientific concepts, procedures, and results using written, oral, and graphic presentation techniques.)	Students will submit lab reports and discuss current topics in Geology – reports and presentations on geological topics such as local topography, hydrology, volcano formation, tsunamis	**Fall** Comp. 3 = 70% **Spring** Comp. 3 = 75%	
4. Students will apply quantitative analysis to scientific problems. Students should: a. Select and perform appropriate quantitative analyses of scientific observations. b. Show familiarity with the metric system, use a calculator to perform appropriate mathematical operations, and present results in tables and graphs.	Students will perform calculations throughout the course in areas including earthquake intensity, isotope half-life, radiocarbon dating	**Fall** Comp. 4 = 78% **Spring** Comp. 4 = 81%	

Competencies (Learning Outcomes Being Measured)	Assessment Procedures (Process/Instrument named or described – rubric attached)	Assessment Results	How Results Will Be Used To Make Improvements
5. Students will apply scientific thinking to real world problems. Students should: a. Critically evaluate scientific reports or accounts presented in the popular media. b. Understand the basic scientific facts related to important contemporary issues (e.g., global warming, stem cell research, cosmology), and ask informed questions about those issues. End – Laboratory Science	Current topics in Geology – through lecture and student discussion	**Fall** Comp. 5 = 72% **Spring** Comp. 5 = 70%	

Faculty Member Completing Assessment: **Date:**

Reviewed by: **Date:**
(Division chair)

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Clovis Community College
Core Competencies Assessment 2014-2015—Area III: Laboratory Science

Class: Physics 113 Survey of Physics and Lab **Faculty: Carl Armstrong**

Common Core No.: PHYS 1592 and PHYS 1692

Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**
1. Students will describe the process of scientific inquiry. Students should: a. Understand that scientists rely on evidence obtained from observations rather than authority, tradition, doctrine, or intuition. b. Students should value science as a way to develop reliable knowledge about the world.	Students were required to answer multiple choice and short answer questions on a chapter quiz and on the final exam dealing with the scientific method.	The students were able to select the correct answer 90 percent of the time on the multiple-choice questions. They had an average score of 85 percent on the short answer questions.	Students will be presented with additional examples of correct and incorrect responses to questions dealing with the scientific method.
2. Students will solve problems scientifically. Students should: a. Be able to construct and test hypotheses using modern lab equipment (such as microscopes, scales, computer technology) and appropriate quantitative methods. b. Be able to evaluate isolated observations about the physical universe and relate them to hierarchically organized explanatory frameworks (theories).	Students conducted five laboratory exercises dealing with mechanics, thermodynamics, simple harmonic motion, DC circuits, and light and optics. They collected data and performed calculations. They compared their results to the accepted values and were required to discuss any deviations from the accepted values.	The students had very few problems collecting data and with performing the calculations associated with these labs. They were less capable when it came to discussing why they might have deviations from the accepted values.	Students will be given hypothetical results before they conduct labs. They will be instructed how they might explain why these results vary from the accepted values. The students will be given additional guidance while they are preparing their lab reports to ensure that they are address variations from the accepted values.

Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**
3. Students will communicate scientific information. Students should: Communicate effectively about science (e.g., write lab reports in standard format and explain basic scientific concepts, procedures, and results using written, oral, and graphic presentation techniques.)	Students prepared written reports for each of the five lab exercises conducted during the course. The reports were graded and returned to the students.	With the exception noted above regarding discussion of deviations from accepted values, the students' lab reports were universally well written. The median grade for lab reports was 84 percent.	See the note above regarding addition instruction in how to evaluate and explain deviations from the accepted value.
4. Students will apply quantitative analysis to scientific problems. Students should: a. Select and perform appropriate quantitative analyses of scientific observations. b. Show familiarity with the metric system, use a calculator to perform appropriate mathematical operations, and present results in tables and graphs.	Students were required to perform calculations in order to solve problems on homework assignments, chapter quizzes, lab reports, and the final exam. These calculations involved manipulation of equations, scientific notation, and significant figures.	There were wide differences in the level of math proficiency among the students. Most were comfortable using calculators to perform calculations, but some students scored noticeably lower on their calculations compared to their scores on multiple-choice and short answer questions.	All students will be given additional opportunities to practice calculations during the first three weeks of class. (This is before the first quiz and first lab report.) Students who have difficulty with these calculations will be given additional assistance during class and they will be encouraged to seek assistance from the math tutors on campus.

Page 3 of 3 Course: Physics 113 Survey of Physics and Lab **Common Core No.: PHYS 1592/PHYS 1692**

Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**
5. Students will apply scientific thinking to real world problems. Students should: a. Critically evaluate scientific reports or accounts presented in the popular media. b. Understand the basic scientific facts related to important contemporary issues (e.g., global warming, stem cell research, cosmology), and ask informed questions about those issues. End – Laboratory Science	Subjects examined during class included the origin of the universe, alternative sources of energy, the impact of technology on daily life, and uses of nuclear physics. Students were required to discuss these subjects using the available scientific evidence support to support their conclusions.	Students were able to distinguish beliefs that were not supported by scientific evidence. The students demonstrated an appreciation of how the scientific method is used to explain observations.	Students will continue to be presented with scenarios and examples of phenomenon and they will be expected to examine them using scientific evidence.

Faculty Member Completing Assessment: Carl Armstrong **Date: June 21, 2015**

Reviewed by: Todd Kuykendall **Date: June 21, 2015**
(Division chair)

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Clovis Community College
Core Competencies Assessment 2014-2015—Area III: Laboratory Science

Class: Physics 151 General Physics I and Lab **Faculty: Carl Armstrong**

Common Core No.: PHYS 1792

Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**
1. Students will describe the process of scientific inquiry. Students should: a. Understand that scientists rely on evidence obtained from observations rather than authority, tradition, doctrine, or intuition. b. Students should value science as a way to develop reliable knowledge about the world.	Students were required to answer multiple choice and short answer questions on a chapter quiz and on the final exam dealing with the scientific method.	The students were able to select the correct answer 95 percent of the time on the multiple-choice questions. They had an average score of 90 percent on the short answer questions.	Students will be presented with additional examples of correct and incorrect responses to questions dealing with the scientific method.
2. Students will solve problems scientifically. Students should: a. Be able to construct and test hypotheses using modern lab equipment (such as microscopes, scales, computer technology) and appropriate quantitative methods. b. Be able to evaluate isolated observations about the physical universe and relate them to hierarchically organized explanatory frameworks (theories).	Students conducted five laboratory exercises dealing with static equilibrium, kinematics, conservation of energy, rotational motion, and simple harmonic motion and wave behavior. They collected data and performed calculations. They compared their results to the accepted values and were required to discuss any deviations from the accepted values.	The students had very few problems collecting data and with performing the calculations associated with these labs. They were less capable when it came to discussing why they might have deviations from the accepted values.	Students will be given hypothetical results before they conduct labs. They will be instructed how they might explain why these results vary from the accepted values. The students will be given additional guidance while they are preparing their lab reports to ensure that they are address variations from the accepted values.

Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**
3. Students will communicate scientific information. Students should: Communicate effectively about science (e.g., write lab reports in standard format and explain basic scientific concepts, procedures, and results using written, oral, and graphic presentation techniques.)	Students prepared written reports for each of the five lab exercises conducted during the course. The reports were graded and returned to the students.	With the exception noted above regarding discussion of deviations from accepted values, the students' lab reports were universally well written. The median grade for lab reports was 88 percent.	See the note above regarding addition instruction in how to evaluate and explain deviations from the accepted value.
4. Students will apply quantitative analysis to scientific problems. Students should: a. Select and perform appropriate quantitative analyses of scientific observations. b. Show familiarity with the metric system, use a calculator to perform appropriate mathematical operations, and present results in tables and graphs.	Students were required to perform calculations in order to solve problems on homework assignments, chapter quizzes, lab reports, and the final exam. These calculations involved manipulation of equations, scientific notation, significant figures, and trigonometric relationships.	The students in this class had well above average math skills and they had very little difficulty using calculators to perform the required calculations.	All students will continue to be required to perform calculations using calculators.

Competencies (Learning Outcomes Being Measured)	Assessment Procedures (Process/Instrument named or described – rubric attached)	Assessment Results	How Results Will Be Used To Make Improvements
5. Students will apply scientific thinking to real world problems. Students should: a. Critically evaluate scientific reports or accounts presented in the popular media. b. Understand the basic scientific facts related to important contemporary issues (e.g., global warming, stem cell research, cosmology), and ask informed questions about those issues. End – Laboratory Science	Subjects examined during class included the origin of the universe, alternative sources of energy, efficiencies associated with energy transformation, and the impact of technology on daily life. Students were required to discuss these subjects using the available scientific evidence support to support their conclusions.	Students were able to distinguish beliefs that were not supported by scientific evidence. The students demonstrated an appreciation of how the scientific method is used to explain observations.	Students will continue to be presented with scenarios and examples of phenomenon and they will be expected to examine them using scientific evidence.

Faculty Member Completing Assessment: Carl Armstrong **Date: June 21, 2015**

Reviewed by: **Date:**
(Division chair)

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Clovis Community College
Core Competencies Assessment 2014-2015—Area III: Laboratory Science

Class: Physics 152 General Physics II and Lab **Faculty: Carl Armstrong**

Common Core No.: PHYS 1892

Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**
1. Students will describe the process of scientific inquiry. Students should: a. Understand that scientists rely on evidence obtained from observations rather than authority, tradition, doctrine, or intuition. b. Students should value science as a way to develop reliable knowledge about the world.	Students were required to answer multiple choice and short answer questions on a chapter quiz and on the final exam dealing with the scientific method.	The students were able to select the correct answer 93 percent of the time on the multiple-choice questions. They had an average score of 86 percent on the short answer questions.	Students will be presented with additional examples of correct and incorrect responses to questions dealing with the scientific method.
2. Students will solve problems scientifically. Students should: a. Be able to construct and test hypotheses using modern lab equipment (such as microscopes, scales, computer technology) and appropriate quantitative methods. b. Be able to evaluate isolated observations about the physical universe and relate them to hierarchically organized explanatory frameworks (theories).	Students conducted four laboratory exercises dealing with thermodynamics, DC circuits, electromagnetic induction, and light and optics. They collected data and performed calculations. They compared their results to the accepted values and were required to discuss any deviations from the accepted values.	The students had very few problems collecting data and with performing the calculations associated with these labs. They were less capable when it came to discussing why they might have deviations from the accepted values.	Students will be given hypothetical results before they conduct labs. They will be instructed how they might explain why these results vary from the accepted values. The students will be given additional guidance while they are preparing their lab reports to ensure that they are address variations from the accepted values.

Competencies (Learning Outcomes Being Measured)	**Assessment Procedures** (Process/Instrument named or described – rubric attached)	**Assessment Results**	**How Results Will Be Used To Make Improvements**
3. Students will communicate scientific information. Students should: Communicate effectively about science (e.g., write lab reports in standard format and explain basic scientific concepts, procedures, and results using written, oral, and graphic presentation techniques.)	Students prepared written reports for each of the five lab exercises conducted during the course. The reports were graded and returned to the students.	With the exception noted above regarding discussion of deviations from accepted values, the students' lab reports were universally well written. The median grade for lab reports was 84 percent.	See the note above regarding addition instruction in how to evaluate and explain deviations from the accepted value.
4. Students will apply quantitative analysis to scientific problems. Students should: a. Select and perform appropriate quantitative analyses of scientific observations. b. Show familiarity with the metric system, use a calculator to perform appropriate mathematical operations, and present results in tables and graphs.	Students were required to perform calculations in order to solve problems on homework assignments, chapter quizzes, lab reports, and the final exam. These calculations involved manipulation of equations, scientific notation, significant figures, and trigonometric relationships.	The students in this class had well above average math skills and they had very little difficulty using calculators to perform the required calculations.	All students will continue to be required to perform calculations using calculators.

Competencies (Learning Outcomes Being Measured)	Assessment Procedures (Process/Instrument named or described – rubric attached)	Assessment Results	How Results Will Be Used To Make Improvements
5. Students will apply scientific thinking to real world problems. Students should: a. Critically evaluate scientific reports or accounts presented in the popular media. b. Understand the basic scientific facts related to important contemporary issues (e.g., global warming, stem cell research, cosmology), and ask informed questions about those issues. End – Laboratory Science	Subjects examined during class included the origin of the universe, the reality of the second law of thermodynamics, the impact of technology on daily life, and uses of nuclear physics. Students were required to discuss these subjects using the available scientific evidence support to support their conclusions.	Students were able to distinguish beliefs that were not supported by scientific evidence. The students demonstrated an appreciation of how the scientific method is used to explain observations.	Students will continue to be presented with scenarios and examples of phenomenon and they will be expected to examine them using scientific evidence.

Faculty Member Completing Assessment: Carl Armstrong **Date: June 21, 2015**

Reviewed by: Todd Kuykendall **Date: June 21, 2015**
(Division chair)

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