

Core Competencies Assessment 2009-2010: Area III Courses

Mesalands Community College
GEOL 151 Physical Geology

Laboratory Science Competencies
GEOL 1114

<u>State Competencies</u> (Learning Outcomes Being Measured)	<u>Assessment Procedures</u> (Process/Instrument named or described – rubric attached)	<u>Assessment Results</u>	<u>How Results Will Be Used To Make Improvements</u>	<u>(Optional)</u> Recommendations/Goals/ Priorities
<p>1. Students will describe the process of scientific inquiry. Students should:</p> <ol style="list-style-type: none"> 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. 	<p>Lab exercise 'Formation of Upheaval Dome'</p> <ol style="list-style-type: none"> 1. Introduction to crater-like structure by means of three-dimensional block-diagram 2. Present three hypotheses about the formation of the crater 3. Students formulate predictions to test each hypothesis 4. Students test their predictions and evaluate hypotheses by gathering data from geologic profile and block diagram of structure 	<ol style="list-style-type: none"> 1. All students recognized the fundamental importance of an initial observation that leads to a question 2. All students formulated appropriate predictions and came to a realistic assessment of validity of their assigned hypothesis 3. 33% of the students did not realize that hypotheses are not proved by supporting data but need continuing testing 	<p>Assignment was adopted because it leads from observation via formulation of hypotheses and testing to a conceptual understanding of the scientific method</p> <p>Assessment will be expanded to an additional prediction/testing cycle with new data to illustrate that science is no finite but a continuing process</p>	<p>Teaching/Assessment Goals: Evaluate which of the three hypotheses is supported or not supported by additional data</p>
<p>2. Students will solve problems scientifically. Students should:</p> <ol style="list-style-type: none"> 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). 				
<p>3. Students will communicate scientific information. Students should:</p>				

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Core Competencies Assessment 2009-2010: Area III Courses, cont.

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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.)				
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.				
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				

Name

Date