2013-2014 ANNUAL ASSESSMENT REPORT TEMPLATE

Part 1: Background Information

B1. Program name: [__Geology_____]
B2. Report author(s): [__Judi Kusnick and Tim Horner_____]
B3. Fall 2012 enrollment: [_100____]
*Us*e the *Department Fact Book 2013* by OIR (Office of Institutional Research) to get the fall 2012 enrollment:
(http://www.csus.edu/oir/Data%20Center/Department%20Fact%20Book/Departmental%20Fact%20Book.html).

B4. Program type: [SELECT ONLY ONE]

X	1. Undergraduate baccalaureate major
	2. Credential
Currently suspended	3. Master's degree
	4. Doctorate: Ph.D./E.D.D.
	5. Other, specify:

Part 2: Six Questions for the 2013-2014 Annual Assessment

Question 1 (Q1): Program Learning Outcomes (PLO) Assessed in 2013-2014.

Q1.1. Which of the following program learning outcomes (PLOs) or Sac State Baccalaureate Learning Goals did you assess **in 2013-2014**? (See 2013-2014 Annual Assessment Report Guidelines for more details). [**CHECK ALL THAT APPLY**]

	1. Critical thinking (WASC 1) [*]
	2. Information literacy (WASC 2)
	3. Written communication (WASC 3)
	4. Oral communication (WASC 4)
	5. Quantitative literacy (WASC 5)
	6. Inquiry and analysis
	7. Creative thinking
	8. Reading
	9. Team work
	10. Problem solving
	11. Civic knowledge and engagement – local and global
	12. Intercultural knowledge and competency
	13. Ethical reasoning
	14. Foundations and skills for lifelong learning
	15. Global learning
	16. Integrative and applied learning
	17. Overall competencies for GE Knowledge
X	18. Overall competencies in the major/discipline
	19. Others. Specify any PLOs that were **assessed in 2013-2014 but not included above:** a. b.

	c.

* One of the WASC's new requirements is that colleges and universities report on the level of student performance **at graduation** in five core areas: **critical thinking, information literacy, written communication, oral communication, and quantitative literacy.**

Q1.1.1. Please provide more detailed information about the PLO(s) you checked above:

One aspect of competency in the major is mastery of fundamental concepts so that students are prepared to advance in the major. Each year we assess the fundamental knowledge of our juniors and seniors using a short multiple choice and constructed response test. The instrument and results are attached as appendices.

Q1.2. Are your PLOs closely aligned with the mission of the university?

X	1. Yes
	2. No
	3. Don't know

Q1.3. Is your program externally accredited (except for WASC)?

	1. Yes
X	2. No **(If no, go to Q1.4)**
	3. Don't know **(Go to Q1.4)**

Q1.3.1. If yes, are your PLOs closely aligned with the mission/goals/outcomes of the accreditation agency?

	1. Yes
	2. No
	3. Don't know

Q1.4. Have you used the *Degree Qualification Profile* (DQP)[*] to develop your PLO(s)?

X	1. Yes
	2. No, but I know what DQP is.
	3. No. I don't know what DQP is.
	4. Don't know

[*] **Degree Qualifications Profile (DQP)** – a framework funded by the Lumina Foundation that describes the kinds of learning and levels of performance that may be expected of students who have earned an associate, baccalaureate, or master's degree. Please see the links for more details:
http://www.luminafoundation.org/publications/The_Degree_Qualifications_Profile.pdf and
http://www.learningoutcomeassessment.org/DQPNew.html.

Question 2 (Q2): Standards of Performance/Expectations for EACH PLO.

Q2.1. Has the program developed/adopted **EXPLICIT** standards of performance/expectations for the PLO(s) you assessed **in 2013-2014 Academic Year**? (For example: We expect 70% of our students to achieve at least a score of 3 on the Written Communication VALUE rubric.)

	1. Yes, we have developed standards/expectations for **ALL** PLOs assessed in 2013-14.
X	2. Yes, we have developed standards/expectations for **SOME** PLOs assessed in 2013-14.
	3. No (**If no, go to Q2.2**)
	4. Don't know (**Go to Q2.2**)
	5. Not Applicable (**Go to Q2.2**)

Q2.1.1. If yes, what are the desired levels of learning, including the criteria and standards of performance/expectations, especially at or near graduation, for **EACH PLO** assessed in 2013-2014 Academic Year? (For example: what will tell you if students have achieved your expected level of performance for the learning outcome.) **Please provide the rubric and/or the expectations that you have developed for EACH PLO one at a time below.** [WORD LIMIT: 300 WORDS FOR EACH PLO]

See our revised assessment plan (Appendix 1) for performance standards, along with our rationale for changing our assessment plan (Appendix 2). Our revision of the Written Communication VALUE Rubric is attached (Appendix 3).

Q2.2. Have you published the **PLO(s)/expectations/rubric(s) you assessed in 2013-2014**?

X	1. Yes
	2. No **(If no, go to Q3.1)**

Q2.2.1. If yes, where were the **PLOs/expectations/rubrics** published? **[CHECK ALL THAT APPLY]**

	1. In **SOME course syllabi/assignments** in the program that claim to introduce/develop/master the PLO(s)
	2. In **ALL course syllabi/assignments** in the program that claim to introduce/develop/master the PLO(s)
	3. In the student handbook/advising handbook
	4. In the university catalogue
	5. On the academic unit website or in the newsletters
X	6. In the assessment or program review reports/plans/resources/activities
	7. In the new course proposal forms in the department/college/university
	8. In the department/college/university's strategic plans and other planning documents
	9. In the department/college/university's budget plans and other resource allocation documents
	10. In other places, specify:

Question 3 (Q3): Data, Results, and Conclusions for EACH PLO

Q3.1. Was assessment data/evidence **collected** for 2013-2014?

X	1. Yes
	2. No **(If no, go to Part 3: Additional Information)**
	3. Don't know **(Go to Part 3)**
	4. Not Applicable **(Go to Part 3)**

Q3.2. If yes, was the data **scored/evaluated** for 2013-2014?

X	1. Yes
	2. No **(If no, go to Part 3: Additional Information)**
	3. Don't know **(Go to Part 3)**
	4. Not Applicable **(Go to Part 3)**

Q3.3. If yes, what **DATA** have you collected? What are the **results, findings, and CONCLUSION(s)** for EACH PLO assessed in 2013-2014? In what areas are students doing well and achieving the expectations? In what areas do students need improvement? Please provide a simple and clear summary of the key data and findings, including **tables and graphs** if applicable for EACH PLO one at a time. [WORD LIMIT: 600 WORDS FOR EACH PLO]

See Appendix 4 for the instrument we used and Appendix 5 for results and analysis of 2013 Student Knowledge Inventory.

Q3.4. Do students meet the expectations/standards of performance as determined by the program and achieved the learning outcomes? [PLEASE MAKE SURE THE PLO YOU SPECIFY HERE IS THE SAME ONE YOU CHECKED/SPECIFIED IN Q1.1].

Q3.4.1. First PLO: [_____Overall competencies in the major/discipline_____]

	1. Exceed expectation/standard
	2. Meet expectation/standard
	3. Do not meet expectation/standard
	4. No expectation/standard set
	5. Don't know

I don't know how to answer this question with a checkmark. Please see the attached analysis in Appendix 4.

Question 4 (Q4): Evaluation of Data Quality: Reliability and Validity.

Q4.1. How many PLOs **in total** did your program **assess in the 2013-2014 academic year**?
[___1___]

Q4.2. Please choose **ONE ASSESSED PLO** as an example to illustrate how you use direct, indirect, and/or other methods/measures to collect data. If you only assessed one PLO **in 2013-14**, YOU CAN SKIP this question. If you assessed MORE THAN ONE PLO, please check **ONLY ONE PLO BELOW EVEN IF YOU ASSESSED MORE THAN ONE PLO IN 2013-2014.**

	1. Critical thinking (WASC 1) [1]
	2. Information literacy (WASC 2)
	3. Written communication (WASC 3)
	4. Oral communication (WASC 4)
	5. Quantitative literacy (WASC 5)
	6. Inquiry and analysis
	7. Creative thinking
	8. Reading
	9. Team work
	10. Problem solving
	11. Civic knowledge and engagement – local and global
	12. Intercultural knowledge and competency
	13. Ethical reasoning
	14. Foundations and skills for lifelong learning
	15. Global learning
	16. Integrative and applied learning
	17. Overall competencies for GE Knowledge
X	18. Overall competencies in the major/discipline
	19. Other PLO. Specify:

Direct Measures

Q4.3. Were direct measures used to assess this PLO?

x	1. Yes
	2. No **(If no, go to Q4.4)**
	3. Don't know **(Go to Q4.4)**

Q4.3.1. Which of the following DIRECT measures were used? [**Check all that apply**]

	1. Capstone projects (including theses, senior theses), courses, or experiences
	2. Key assignments from other CORE classes
	3. Key assignments from other classes
	4. Classroom based performance assessments such as simulations, comprehensive exams, critiques
	5. External performance assessments such as internships or other community based projects
	6. E-Portfolios
	7. Other portfolios
X	8. Other measure. Specify: Student Knowledge Inventory

Q4.3.2. Please provide the direct measure(s) **[key assignment(s)/project(s)/portfolio(s)]** that you used to collect the data. [WORD LIMIT: 300 WORDS]

The Student Knowledge Inventory is an instrument we have used for over five years to measure students' mastery of introductory concepts in geology. The instrument includes multiple-choice and constructed-response questions. We administer the inventory in the first junior-level course, Geology 100 (Mineralogy) and the first senior-level course (Geology 110A, Structural Geology). The inventory is scored and analyzed yearly, and we have done one longitudinal analysis as well. The inventory is drawn from a collection of questions designed and/or compiled by our faculty. This year's SKI is attached (Appendix 5).

Q4.3.2.1. Was the direct measure(s) [**key assignment(s)/project(s)/portfolio(s**)] aligned directly with the rubric/criterion**?**

X	1. Yes
	2. No
	3. Don't know

Q4.3.3. Was the direct measure (s) [key assignment(s)/project(s)/portfolio(s)] aligned directly with the PLO?

X	1. Yes
	2. No
	3. Don't know

Q4.3.4. How was the evidence scored/evaluated? **[Select one only]**

X	1. No rubric is used to interpret the evidence (If checked, go to Q4.3.7)
	2. Use rubric developed/modified by the faculty who teaches the class
	3. Use rubric developed/modified by a group of faculty
	4. Use rubric pilot-tested and refined by a group of faculty
	5. Use other means. Specify:

Q4.3.5. What rubric/criterion was adopted to score/evaluate the above key assignments/projects/portfolio? **[Select one only]**

	1. The VALUE rubric(s)
	2. Modified VALUE rubric(s)
	3. A rubric that is totally developed by local faculty
	4. Use other means. Specify:

Q4.3.6. Was the rubric/criterion aligned directly with the PLO?

	1. Yes
	2. No
	3. Don't know

Q4.3.7. Were the evaluators (e.g., faculty or advising board members) who reviewed student work calibrated to apply assessment criteria in the same way?

	1. Yes
	2. No
	3. Don't know
X	4. Not Applicable

Q4.3.8. Were there checks for inter-rater reliability?

	1. Yes
X	2. No
	3. Don't know

Q4.3.9. Were the sample sizes for the direct measure adequate?

	1. Yes
X	2. No
	3. Don't know

Q4.3.10. How did you select the sample of student work (papers, projects, portfolios, etc)? Please briefly specify here:

All students enrolled in Geology 100 and Geology 110A took the test.

Q4.4. Were indirect measures used to assess the PLO?

	1. Yes
X	2. No **(If no, go to Q4.5)**

Q4.4.1. Which of the following indirect measures were used?

	1. National student surveys (e.g., NSSE, etc.)
	2. University conducted student surveys (OIR surveys)
	3. College/Department/program conducted student surveys
	4. Alumni surveys, focus groups, or interviews
	5. Employer surveys, focus groups, or interviews
	6. Advisory board surveys, focus groups, or interviews
	7. Others, specify:

Q4.4.2. If surveys were used, were the sample sizes adequate?

	1. Yes
	2. No
	3. Don't know

Q4.4.3. If surveys were used, please briefly specify how you select your sample? What is the response rate?

Q4.5. Were external benchmarking data used to assess the PLO?

	1. Yes
X	2. No **(If no, go to Q4.6)**

Q4.5.1. Which of the following measures was used?

	1. National disciplinary exams or state/professional licensure exams
	2. General knowledge and skills measures (e.g., CLA, CAAP, ETS PP, etc)
	3. Other standardized knowledge and skill exams (e.g., ETS, GRE, etc)
	4. Others, specify:

Q4.6. Were other measures used to assess the PLO?

	1. Yes
X	2. No **(Go to Q4.7)**
	3. Don't know **(Go to Q4.7)**

Q4.6.1. If yes, please specify: [_____]

Alignment and Quality

Q4.7. Please describe how you collected the data? For example, in what course(s) (or by what means) were data collected? How reliable and valid is the data? [WORD LIMIT: 300 WORDS]

As described above, all students in Geology 100 and 110A took the test. As for validity, we rotate the questions on the inventory and eliminate questions that present problems. Some of the questions are from research instruments and so have been externally validated. The constructed-response items are scored by a single rater using a scoring system that the entire faculty reviews. We do not see a need for another scorer, since the scoring system has little discretion. So reliability is not really an issue. See Appendix 4 and 5 for the instrument and analysis.

Q4.8. How many assessment tools/methods/measures **in total** did you use to assess this PLO? [__1___]
<mark>**NOTE: IF IT IS ONLY ONE, GO TO Q5.1.**</mark>

Q4.8.1. Did the data (including all the assignments/projects/portfolios) from all the different assessment tools/measures/methods directly align with the PLO?

	1. Yes
	2. No
	3. Don't know

Q4.8.2. Were **ALL** the assessment tools/measures/methods that were used good measures for the PLO?

	1. Yes
	2. No
	3. Don't know

Question 5 (Q5): Use of Assessment Data.

Q5.1. To what extent have the assessment results **from 2012-2013** been used for? **[CHECK ALL THAT APPLY]**

	Very Much (1)	Quite a Bit (2)	Some (3)	Not at all (4)	Not Applicable (9)
1. Improving specific courses	X				
2. Modifying curriculum	X				
3. Improving advising and mentoring		X			
4. Revising learning outcomes/goals	X				
5. Revising rubrics and/or expectations	X				
6. Developing/updating assessment plan	X				
7. Annual assessment reports	X				
8. Program review					X
9. Prospective student and family information					X
10. Alumni communication					X
11. WASC accreditation (regional accreditation)					
12. Program accreditation					
13. External accountability reporting requirement					X
14. Trustee/Governing Board deliberations					X
15. Strategic planning					
16. Institutional benchmarking					
17. Academic policy development or modification					
18. Institutional Improvement					
19. Resource allocation and budgeting					
20. New faculty hiring					
21. Professional development for faculty and staff		X			
22. Other Specify:					

Q5.1.1. Please provide one or two best examples to show how you have used the assessment data above.

See attached report in Appendix 6.

Q5.2. As a result of the **assessment effort in 2013-2014** and based on the prior feedbacks from OAPA, do you anticipate making any changes for your program (e.g., course structure, course content, or modification of program learning outcomes)?

X	1. Yes
	2. No **(If no, go to Q5.3)**
	3. Don't know **(Go to Q5.3)**

Q5.2.1. What changes are anticipated? By what mechanism will the changes be implemented? How and when will you assess the impact of proposed modifications? [WORD LIMIT: 300 WORDS]

We anticipate better coordination of our courses, especially our field courses. Instructors have opened discussions on how to make the courses more uniform and coherent.

Q5.2.2. Is there a follow-up assessment on these areas that need improvement?

	1. Yes
	2. No
X	3. Don't know

Q5.3. Many academic units have collected assessment data on aspects of a program that are not related to program learning outcomes (i.e., impacts of an advising center, etc.). If your program/academic unit has collected assessment data in this way, please briefly report your results here. [WORD LIMIT: 300 WORDS]

Question 6 (Q6). Which program learning outcome(s) do you plan to assess next year?

	1. Critical thinking (WASC 1) [1]
	2. Information literacy (WASC 2)
X	3. Written communication (WASC 3)
	4. Oral communication (WASC 4)
	5. Quantitative literacy (WASC 5)
	6. Inquiry and analysis
	7. Creative thinking
	8. Reading
	9. Team work
X	10. Problem solving
	11. Civic knowledge and engagement – local and global
	12. Intercultural knowledge and competency
	13. Ethical reasoning
	14. Foundations and skills for lifelong learning
	15. Global learning
	16. Integrative and applied learning
	17. Overall competencies for GE Knowledge
X	18. Overall competencies in the major/discipline
	19. Others. Specify any PLOs that the program is going to **assess but not included above:** a. b. c.

Part 3: Additional Information

A1. In which academic year did you **develop** the current assessment plan?

X	1. Before 2007-2008
	2. 2007-2008
	3. 2008-2009
	4. 2009-2010
	5. 2010-2011
	6. 2011-2012
	7. 2012-2013
	8. 2013-2014
	9. Have not yet **developed** a formal assessment plan

A2. In which academic year did you last **update** your assessment plan?

	1. Before 2007-2008
	2. 2007-2008
	3. 2008-2009
	4. 2009-2010
	5. 2010-2011
	6. 2011-2012
	7. 2012-2013
X	8. 2013-2014
	9. Have not yet **updated** the assessment plan

A3. Have you developed a curriculum map for this program?

X	1. Yes
	2. No
	3. Don't know

A4. Has the program indicated explicitly where the assessment **of student learning** occurs in the curriculum?

X	1. Yes
	2. No
	3. Don't know

A5. Does the program have any capstone class?

X	1. Yes
	2. No
	3. Don't know

A5.1. If yes, please list the course number for each capstone class: [__Geology 188_____]

A6. Does the program have **ANY** capstone project?

	1. Yes
X	2. No
	3. Don't know

A7. Name of the academic unit: [_NSM ____]

A8. Department in which the academic unit is located: [_Geology___]

A9. Department Chair's Name: [_Tim Horner_____]

A10. Total number of annual assessment reports submitted by your academic unit for 2013-2014: [_1___]

A11. College in which the academic unit is located:

	1. Arts and Letters
	2. Business Administration
	3. Education
	4. Engineering and Computer Science
	5. Health and Human Services
X	6. Natural Science and Mathematics
	7. Social Sciences and Interdisciplinary Studies
	8. Continuing Education (CCE)
	9. Other, specify:

==*Undergraduate Degree Program(s):*==
A12. Number of undergraduate degree programs the academic unit has: [__3_ ___]
A12.1. List all the name(s): [_BS Geology, BA Geology, BA Earth Science_____]
A12.2. How many concentrations appear on the diploma for this undergraduate program? [__none_ ___]

==*Master Degree Program(s):*==
A13. Number of Master's degree programs the academic unit has: [_1_ ___]
A13.1. List all the name(s): [_MS in Geology, currently suspended_____]
A13.2. How many concentrations appear on the diploma for this master program? [_0_____]

==*Credential Program(s):*==
A14. Number of credential degree programs the academic unit has: [_0_____]
A14.1. List all the names: [_____]

==*Doctorate Program(s)*==
A15. Number of doctorate degree programs the academic unit has: [_0_____]
A15.1. List the name(s): [_____]

2013/2014 Annual Assessment Report Appendices

Geology Department

College of Natural Sciences and Mathematics

Sacramento State University

Appendix 1

Revised Assessment Plan 2014

Overall Program Goals for All Programs of the Geology Dept.

I. Students are prepared for professional and /or graduate study involving the geosciences;
II. Students develop a deep understanding of Earth systems: how Earth systems work and how they interact;
III. Students develop their ability to solve geologic problems through the use of scientific method;
IV. Students develop a deep curiosity about how the Earth works, and a lifelong appreciation of the Earth's place in space and time; and
V. Students develop their technical communication skills: seeking and processing technical information; and communicating technical information and conclusions in both oral and written form.

Summary of Assessment Data:

- Student Knowledge Inventory
- Geology 188 field maps and assignments
- Geology 111B field maps and assignments
- Embedded assignments from majors courses
- Writing rubrics from required assignments
- CSET scores

Summary of Assessment Tasks for 2014-2019

Year	Periodic Tasks	Yearly Tasks
2014-15	Geology 188 review	1. Administer SKI in Fall semester; compile results & review. 2. Collect Geology 188 rubrics, cross-sections and select maps
2015-16	Geology 111B review	3. Collect Geology 111B rubrics, cross-sections and maps.

Appendix 1

		4. Collect writing rubrics
		5. Collect embedded assignments from one course.
2016-17	Embedded assessment review Geology 188 review	6. Collect CSET data from Earth Science majors.
2017-18	Writing review Geology 111B review	
2018-19	SKI longitudinal review	

Appendix 1

BS in Geology

Program Learning Outcome	Assessment Method(s)	Performance Standard	Assessment Schedule
Students will master a set of fundamental geologic concepts essential to understanding and solving geologic problems	Student Knowledge Inventory	70% of seniors answer questions in each domain correctly	Every Fall, administered in Geology 100 and Geology 102. Collect data yearly, review annual data yearly, do longitudinal review once every five years.
	Embedded assignments, select exam problems/questions	70 % of students answer questions/work problems correctly	Sample one course every year. Analyze data once in 5-year cycle.
Students will be proficient in solving geologic problems	Field assignments from Geology 188	TBD	Collect every year, review every other year. 2014-15 2016-17 2018-19
Students will be proficient in understanding and producing	Field assignments from Geology 188.	TBD	Collect every year, review every other year 2014-15

geologic maps.			2016-17 2017-18
Students will be proficient writers, skilled in the genres of scientific and technical writing	Review rubrics from required writing assignments: • Field report from Geology 111B • Literature review from an elective course	70% of students demonstrate Milestone 2 on revised Written Communication VALUE Rubric	Review once in 5-year cycle.

Appendix 1

BA in Geology

Program Learning Outcome	Assessment Method(s)	Performance Standard	Assessment Schedule
Students will master a set of fundamental geologic concepts essential to understanding and solving geologic problems	Student Knowledge Inventory	70% of students answer questions in each domain correctly	Every Fall, administered in Geology 100 and Geology 102
	Embedded assignments	70 % of students answer questions/work problems correctly	Sample one course every year. Analyze data once in 5-year cycle.
Students will be proficient in solving geologic problems	Field assignments from Geology 111B.	TBD	Collect every year, review every other year. 2015-16 2017-18 2018-19
Students will be proficient in introductory skills of understanding and producing geologic maps.	Field assignments from Geology 111B.	TBD	Collect every year, review every other year. 2015-16 2017-18 2018-19
	Review rubrics from required	70% of students demonstrate Milestone 2 on revised	Review once in 5-year cycle.

Appendix 1

Students will be proficient writers, skilled in the genres of scientific and technical writing	writing assignments: • Field report from Geology 111 • Literature review from an elective course	Written Communication VALUE Rubric	

Appendix 1

BA in Earth Science

Program Learning Outcome	Assessment Method(s)	Performance Standard	Assessment Schedule
Students will master a set of fundamental earth science concepts essential to understanding and solving geologic problems	Student Knowledge Inventory	70% of students answer questions in each domain correctly	Every Fall, administered in Geology 100 and Geology 102
	CSET scores	70% of students will pass Science Subtest #1 on the first try	Collect data yearly, review once every five years
Students will be proficient in solving geologic problems	Field assignments from Geology 111B.	TBD	Collect every year, review every other year. 2015-16 2017-18 2018-19
Students will be proficient in introductory skills of understanding and producing geologic maps.	Field assignments from Geology 111B.	TBD	Collect every year, review every other year. 2015-16 2017-18 2018-19
Students will be proficient writers, skilled in the genres of scientific	Review rubrics from required writing assignments:	70% of students demonstrate Milestone 2 on revised Written	Review once in 5-year cycle.

and technical writing	• Field report from Geology 111 • Literature review from an elective course	Communication VALUE Rubric	

Appendix 2

Appendix 2: Rationale for Assessment Plan Change

During this academic year, 2013-2014, most of the Geology Department's efforts in program assessment were devoted to closing the loop, using data collected and analyzed in previous years to make curricular and program changes. Before gathering and analyzing a lot of data, we decided that we needed to complete two major tasks:

1. Revise our existing assessment plan to better address current university assessment requirements and establish a five-year plan for program assessment.

2. Use data from last year's assessment efforts to improve the program and eliminate some of the problems we identified last year.

In revising our assessment plan, we set out to do several things:

1. We better differentiated our bachelor's programs by refining our learning outcomes. Now each bachelor's program has one distinct learning outcome and a corresponding assessment strategy to address a distinctive element of the degree program:

   - The BS program involves more training in geologic mapping, and so we are expecting those students to be proficient in using and making maps.
   - The two BA programs require fewer mapping courses, and so we are expecting those students to display only an introductory level of skills in using and making maps.
   - The two BA programs are distinguished from each other by their breadth of content. The BA in Geology includes primarily geologic topics, while the BA in Earth Science includes courses in meteorology, astronomy and oceanography. We therefore established different learning outcomes in terms of program content. Geology BA students should master fundamental concepts in geology, while Earth Science students must demonstrate mastery of earth science topics.

2. In the past we have measured students' mastery of introductory material through our Student Knowledge Inventory, which we administer yearly in one junior level and one senior level course. Up until now, we have not measured students' knowledge from their junior and senior level classes,

Appendix 2

except indirectly through their performance in the senior field class. We now propose three mechanisms to collect evidence of students' more advanced knowledge:

- We plan to collect at least one set of embedded assessments. For our first experiment with this process, we plan to collect the stratigraphy assignment from Geology 111B, a course taken by all of our majors. At our annual assessment retreat we will look at overall student performance as measured on a rubric used in the course, and we will examine a selection of high-scoring, low-scoring and medium-scoring assignments.

- We will also look at student performance on selected exam questions and problems. The goal is to review student learning in a selection of geologic areas. Again, we will look at overall student scores, and review a selection of high-, medium- and low-scoring answers.
- Measuring Earth Science students' knowledge is more difficult, as many of the courses they take are offered in other departments where we do not have access to our students' assignments or exams. However, almost all of our Earth Science students plan to become teachers. As part of the process of getting a teacher credential, they are required to demonstrate their subject matter competence by taking an exam, the CSET (California Subject Examinations for Teachers). We propose to have our students report to us their scores on the Earth Science subtest. We have only a few students enrolled in this program, so we will accumulate this data and analyze it once in five years.

3. We have begun to set performance standards for each of our learning outcomes. Because this is a new process for us, all of the performance standards indicated are tentative – our first projection of what a reasonable expectation should be. For some learning outcomes, we are still working out our measurement and thus the performance standard.

4. We mapped our revised learning outcomes onto our current course configuration.

5. We considered how we could use the VALUE rubrics in our program assessment. After examining the rubrics we thought might best match our program, we concluded that the VALUE rubrics as written are difficult to apply to our program. The authors of the rubrics had a particular vision of inquiry, critical thinking and problem-solving which does not map well onto the skills and thought processes of an entry-level geologist. We did find that some categories of the Written Communication rubric could work for us. We therefore propose to experiment with using the Written Communication VALUE Rubric (ignoring the Content Development category) alongside of the rubric that we currently use for assessing writing.

WRITTEN COMMUNICATION VALUE RUBRIC

for more information, please contact value@aacu.org

AA
C&U
Association
of American
Colleges and
Universities

The VALUE rubrics were developed by teams of faculty experts representing colleges and universities across the United States through a process that examined many existing campus rubrics and related documents for each learning outcome and incorporated additional feedback from faculty. The rubrics articulate fundamental criteria for each learning outcome, with performance descriptors demonstrating progressively more sophisticated levels of attainment. The rubrics are intended for institutional-level use in evaluating and discussing student learning, not for grading. The core expectations articulated in all 15 of the VALUE rubrics can and should be translated into the language of individual campuses, disciplines, and even courses. The utility of the VALUE rubrics is to position learning at all undergraduate levels within a basic framework of expectations such that evidence of learning can by shared nationally through a common dialog and understanding of student success.

Definition

Written communication is the development and expression of ideas in writing. Written communication involves learning to work in many genres and styles. It can involve working with many different writing technologies, and mixing texts, data, and images. Written communication abilities develop through iterative experiences across the curriculum.

Framing Language

This writing rubric is designed for use in a wide variety of educational institutions. The most clear finding to emerge from decades of research on writing assessment is that the best writing assessments are locally determined and sensitive to local context and mission. Users of this rubric should, in the end, consider making adaptations and additions that clearly link the language of the rubric to individual campus contexts.

This rubric focuses assessment on how specific written work samples or collectios of work respond to specific contexts. The central question guiding the rubric is "How well does writing respond to the needs of audience(s) for the work?" In focusing on this question the rubric does not attend to other aspects of writing that are equally important: issues of writing process, writing strategies, writers' fluency with different modes of textual production or publication, or writer's growing engagement with writing and disciplinarity through the process of writing.

Evaluators using this rubric must have information about the assignments or purposes for writing guiding writers' work. Also recommended is including reflective work samples of collections of work that address such questions as: What decisions did the writer make about audience, purpose, and genre as s/he compiled the work in the portfolio? How are those choices evident in the writing -- in the content, organization and structure, reasoning, evidence, mechanical and surface conventions, and citational systems used in the writing? This will enable evaluators to have a clear sense of how writers understand the assignments and take it into consideration as they evaluate

The first section of this rubric addresses the context and purpose for writing. A work sample or collections of work can convey the context and purpose for the writing tasks it showcases by including the writing assignments associated with work samples. But writers may also convey the context and purpose for their writing within the texts. It is important for faculty and institutions to include directions for students about how they should represent their writing contexts and purposes.

Faculty interested in the research on writing assessment that has guided our work here can consult the National Council of Teachers of English/Council of Writing Program Administrators' White Paper on Writing Assessment (2008; www.wpacouncil.org/whitepaper) and the Conference on College Composition and Communication's Writing Assessment: A Position Statement (2008; www.ncte.org/cccc/resources/positions/123784.htm)

Glossary

The definitions that follow were developed to clarify terms and concepts used in this rubric only.

- Content Development: The ways in which the text explores and represents its topic in relation to its audience and purpose.
- Context of and purpose for writing: The context of writing is the situation surrounding a text: who is reading it? who is writing it? Under what circumstances will the text be shared or circulated? What social or political factors might affect how the text is composed or interpreted? The purpose for writing is the writer's intended effect on an audience. Writers might want to persuade or inform; they might want to report or summarize information; they might want to work through complexity or confusion; they might want to argue with other writers, or connect with other writers; they might want to convey urgency or amuse; they might write for themselves or for an assignment or to remember.
- Disciplinary conventions: Formal and informal rules that constitute what is seen generally as appropriate within different academic fields, e.g. introductory strategies, use of passive voice or first person point of view, expectations for thesis or hypothesis, expectations for kinds of evidence and support that are appropriate to the task at hand, use of primary and secondary sources to provide evidence and support arguments and to document critical perspectives on the topic. Writers will incorporate sources according to disciplinary and genre conventions, according to the writer's purpose for the text. Through increasingly sophisticated use of sources, writers develop an ability to differentiate between their own ideas and the ideas of others, credit and build upon work already accomplished in the field or issue they are addressing, and provide meaningful examples to readers.
- Evidence: Source material that is used to extend, in purposeful ways, writers' ideas in a text.
- Genre conventions: Formal and informal rules for particular kinds of texts and/or media that guide formatting, organization, and stylistic choices, e.g. lab reports, academic papers, poetry, webpages, or personal essays.

Appendix 3

-     Sources: Texts (written, oral, behavioral, visual, or other) that writers draw on as they work for a variety of purposes -- to extend, argue with, develop, define, or shape their ideas, for example.

Appendix 3

WRITTEN COMMUNICATION VALUE RUBRIC

for more information, please contact value@aacu.org

	Capstone 4	Milestones 3	2	Benchmark 1
Context of and Purpose for Writing **Includes considerations of audience, purpose, and the circumstances surrounding the writing task(s).**	Demonstrates a thorough understanding of context, audience, and purpose that is responsive to the assigned task(s) and focuses all elements of the work.	Demonstrates adequate consideration of context, audience, and purpose and a clear focus on the assigned task(s) (e.g., the task aligns with audience, purpose, and context).	Demonstrates awareness of context, audience, purpose, and to the assigned tasks(s) (e.g., begins to show awareness of audience's perceptions and assumptions).	Demonstrates minimal attention to context, audience, purpose, and to the assigned tasks(s) (e.g., expectation of instructor or self as audience).
Genre and Disciplinary Conventions **Formal and informal rules inherent in the expectations for writing in particular forms and/or academic fields (please see glossary).**	Demonstrates detailed attention to and successful execution of a wide range of conventions particular to a specific discipline and/or writing task (s) including organization, content, presentation, formatting, and stylistic choices	Demonstrates consistent use of important conventions particular to a specific discipline and/or writing task(s), including organization, content, presentation, and stylistic choices	Follows expectations appropriate to a specific discipline and/or writing task(s) for basic organization, content, and presentation	Attempts to use a consistent system for basic organization and presentation.
Sources and Evidence	Demonstrates skillful use of high-quality, credible, relevant sources to develop ideas that are appropriate for the discipline and genre of the writing	Demonstrates consistent use of credible, relevant sources to support ideas that are situated within the discipline and genre of the writing.	Demonstrates an attempt to use credible and/or relevant sources to support ideas that are appropriate for the discipline and genre of the writing.	Demonstrates an attempt to use sources to support ideas in the writing.
Control of Syntax and Mechanics	Uses graceful language that skillfully communicates meaning to readers with clarity and fluency, and is virtually error-free.	Uses straightforward language that generally conveys meaning to readers. The language in the portfolio has few errors.	Uses language that generally conveys meaning to readers with clarity, although writing may include some errors.	Uses language that sometimes impedes meaning because of errors in usage.

Appendix 4

Student Knowledge Inventory   Name _____

Fall 2013

1. The periods of the Paleozoic include (mark all that apply)

    A. Triassic   D. Paleogene

    B. Permian   E. Oligocene

    C. Silurian

2. Different _____ of an element are atoms containing the **same number** of protons but **different** numbers of electrons.

    A. ions   D. isotopes

    B. classes   E. varieties

    C. particles

3. Normal faults occur where

    A. there is horizontal shortening

    B. there is horizontal tension

    C. the hanging wall moves down

    D. the footwall moves up

    E. the hanging wall moves sideways

4. Which of the following statements about the age of rocks is most likely true?

    A. Rocks found in the ocean are about the same age as rocks found on continents

    B. Rocks found on continents are generally older than rocks found in the ocean

    C. Rocks found in the ocean are generally older than rocks found on continents

Appendix 4

D. None of the above; we cannot figure out the age of rocks precisely enough to figure out which rocks are older

5. The difference between ionic and covalent bonding is

   A. in ionic bonding, atoms can share or lose electrons.

   B. ionic bonds are always stronger

   C. covalent bonding only occurs in salts

   D. in covalent bonding, atoms share electrons

   E. covalent bonds can only occur when metals bond.

6. What is the most likely environment where limestone forms?

   A. Fast moving stream

   B. Deep ocean

   C. Flood plain

   D. Shallow ocean or sea

   E. Alluvial fan

Appendix 4

7. The ocean floor

    A. is youngest at the edges

    B. is generally older than continental rocks

    C. is deepest at the edges

    D. is similar in composition to the continents

    E. is created at subduction zones

8. Match each metamorphic rock with at least one parent rock that it might have been before metamorphism (there might be more than one possibility for each parent rock or metamorphic rock). Put the letter or letters of the appropriate parent rock(s) in the blank after the name of the metamorphic rock.

Gneiss _____	a. Sandstone
Slate _____	b. Limestone
Quartzite _____	c. Shale
Greenstone _____	d. Granite
Marble _____	e. Basalt
Schist _____	f. Chert

9. Fill in the chart below with the appropriate igneous rock names. NOTE: you may have used a chart to identify igneous rocks that looked different from this chart. Please think carefully about what rock name goes in which block.

Appendix 4

Texture ⊙ Composition ↓	Fine-grained	Coarse-grained
Mafic		
Intermediate		
Felsic		

10. Identify each of the following materials as either an element (E), a mineral (M) or a rock (R)

arkose_____   phyllite_____   iron_____   peridotite_____
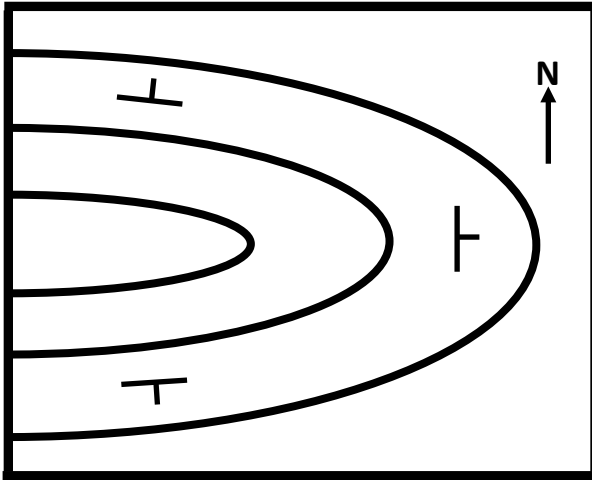

augite_____   calcium_____   mica_____   amphibolite_____

Appendix 4

11. Look at the map below.

A

a. What geologic structure is shown on the map (be as specific as possible)?

b. Put an **O** where you would expect to see the oldest rock in this area.

c. In the box below, draw a cross-section of this structure along the eastern edge of the map from **A** to **B**. (a sketch will do).

B

Appendix 5: Results of Student Knowledge Inventory 2013-14

Topic	G100 46	G110 30	Topic	G100 46	G110 30
Time scale:	50%	20%	**Igneous rocks** People who got all right	2	5
Ion v isotope:	33%	33%	Basalt	39%	60%
Normal faults:	41%	37%	Andesite	24%	30%
Age of rocks:	72%	73%	Rhyolite	26%	27%
Bonding:	61%	77%	Gabbro	17%	37%
Limestone:	83%	77%	Diorite	28%	27%
Ocean floor:	48%	43%	Granite	41%	50%
Metamorphic rocks:	58%	63%	**Elements, Minerals, Rocks**		
Igneous rocks:	30%	39%	Arkose	70%	83%
Minerals, elements, rocks:	64%	79%	Phyllite:	54%	70%
Anticline:	50%	76%	Iron	96%	100%
Metamorphic rocks: People who got all right	3	5	Peridotite	48%	60%
Gneiss	67%	53%	Augite	59%	87%
Slate	80%	87%	Calcium	85%	100%
Quartzite	63%	80%	Mica:	80%	90%
Greenstone	33%	50%	Amphibolite	26%	47%
Marble	46%	73%			
Schist	52%	43%			

Appendix 5: Results of Student Knowledge Inventory 2013-14

Anticline	G100	G110
What is it?	Anticline/dome 30% Syncline 13% Fold 6% Mountain/hill 13% Other 4% No attempt 53%	Anticline 87% Syncline 10% Fold 3%
oldest rock labeled	48% (only 17% consistent with other answers)	80%
X-section	Said anticline, drew anticline 20% Said anticline, drew syncline 9% Said hill, drew hill 15% Said syncline, drew syncline 7% Said syncline, drew anticline 4% Said other, drew fold 13% Said other, drew something 13% No attempt 20%	Said anticline, drew anticline 63% Said anticline, drew syncline 7% Said anticline, drew other 14% Said syncline, drew syncline 3% Said syncline, drew anticline 7% No attempt 7%

Appendix 5: Results of Student Knowledge Inventory 2013-14

Analysis:

All students are doing well (over 70%) on these topics:

- Sedimentary rocks
- Plate tectonics
- Elements

Seniors are doing well on these topics:

- Chemistry
- Structure
- Minerals and elements
- Most metamorphic rocks

Students in general struggle with:

- Geologic time scale
- Igneous rocks
- Some metamorphic rocks
- Unusual rocks (greenstone, peridotite, amphibolite)

Conclusions:

- The problems we have seen in the past with geologic structure may have been an artifact of the question. Seniors are performing at an acceptable level in geologic structure as they enter Geology 110B.
- Seniors are doing better on rocks in general, but still struggling with common igneous field names. This is something to pay attention to in the junior level courses.
- Everyone continues to need more chemistry review as they move through the major.
- Everyone needs more drill on the geologic time scale as they move through the major.

Appendix 5: Results of Student Knowledge Inventory 2013-14

Assessment Activities 2013-14

After several years of collecting data on fundamental geologic knowledge of our students, and last year's efforts in analyzing the seniors' skills in geologic mapping and drawing cross-sections, we decided to focus our assessment efforts this year more on the ultimate goal of assessment - programmatic improvement - and less on the collection and analysis of data. This was a very busy year for the department, and this approach allowed us to be very strategic about our assessment efforts, investing our time where it would do the most good – in using assessment data from previous years to adjust our curriculum, and in coordinating curricular topics across our courses.

Our current focus is to reinforce critical concepts in the upper division core courses by developing a spiraling curriculum in which students use their geologic problem solving and map interpretation skills in progressively more challenging ways. Our assessment efforts this year were designed with this focus in mind:

a. **General Assessment activities:**

- Developed a new assessment plan more consistent with the current vision of program assessment at the University
- Mapped the Program Learning Outcomes onto our current curriculum.
- Held a curriculum mapping meeting in which we examined more specific learning outcomes and their distribution across our curriculum.
- Identified further assessment tasks to be undertaken in 2014-15 including a refinement of our curriculum mapping, specifying our approach to assessing writing, identifying assignments and exam questions to use in measuring geologic problem solving.
-

b. **Program Learning Outcome: Students will master a set of fundamental geologic concepts essential to understanding and solving geologic problems:**

- Inserted the geologic timescale into more courses (G12, G12L, G105, G111A), with more diverse ways to learn the time scale
- Discussed how to add more opportunities for students to interact with rocks outside the petrology courses, which focus primarily on rocks. This will involve curriculum change in other courses.

Appendix 5: Results of Student Knowledge Inventory 2013-14

- Added more work with interpreting maps to G111A to improve the juniors' knowledge of geologic structures
- Revised the Student Knowledge Inventory instrument to see if mediocre performance on igneous rocks was an artifact of the instrument.

c. Program Learning Outcomes:

a. Students will be proficient in solving geologic problems

b. Students will be proficient in understanding and producing geologic maps.

- Inserted more work with maps and cross-sections in G111A.
- Developed new field areas to use in Geology 111 B and Geology 110B.
- Provided students with better feedback on their work in field courses.
- Developed opportunities for students to clarify their mental models of geologic structure as well as their technical skills in drawing maps and cross-sections
- Coordinated among field course faculty to develop more consistent approaches for students to represent their work in field courses (consistent formats in reports, maps, stratigraphic columns and cross sections)

d. Improving Advising:

We recognized an ongoing problem in student advising this year. Some of our transfer students come to us without the chemistry courses required as prerequisites for our junior level geology courses. Some of these students have been unable to enroll in CHEM 4 or CHEM 1A for multiple semesters because those courses are so severely impacted. As a result, we have students unable to even start the upper division portion of the Geology major even though they have been at Sacramento State for two years or more, and in college for four years or more.

To improve our graduation rate and help students move through the major on time, we instituted mandatory advising this year. Every student must see their advisor every semester to ensure that they are on track. Students who do not see their advisor now have a hold placed on their record, and are not allowed to register for the next semester. As part of this effort, we have become more proactive about getting our students into chemistry courses somewhere – including at the neighboring community colleges – so that the students can start their upper division courses in the major.

Appendix 5: Results of Student Knowledge Inventory 2013-14

We made this change based on feedback from our IPP report ranking and an informal survey of the faculty. Our goal is to improve our six-year graduation rate. If this change in advising is successful, we should see an improvement in the next five years.