

Assessment of Earth & Space Science Endorsement Competencies

2007 OSPI Standards for Earth & Space Science	Courses where competencies are met	ASSESSMENTS
1.0 Common Core – Content:		
1.1 The Earth Science teacher knows and understands scientific concepts and principles that are needed to advance student learning as defined by state and national standards developed by the science education community, including major unifying themes. Content includes the big ideas of science and mathematics underlying them. This includes basic principles of biology, chemistry, physics and mathematics as they relate to earth science.	SCED390 GEOL390 GEOL120, 121, 122, 220, 311, 360 GEOG305,310, 314 PHYS 121, 131, 161 CHEM151	Lab reports, written assignments, exams; All students passed with a minimum of 70% West-E Earth Science test - pass rate of 73% (11 attempts, 8 passes)
1.1 Mathematics Applications of mathematics in earth and space science research, including: <ul style="list-style-type: none"> • Algebra. • Probability and statistics 	MATH 106 GEOL 120, 122, 122	Lab reports, written assignments, exams - All students passed with a minimum of 70%
1.2 Knowing – Science is a way of asking and answering questions about the physical universe. <ul style="list-style-type: none"> • Scientific Investigation. • Other ways of knowing. 	All Science Coursework	Lab reports, written assignments, exams, West-E Earth Science test West-E Domain 5 – average = 3.22
1.1.3 Structure of Earth Systems	GEOG 314 GEOL 120, 121, 220, 311, 360	Lab reports, written assignments, exams, West-E Earth Science test Domain 1,2 and 3 average = 3.07
1.1.4 Earth History	GEOL 120, 121, 122, 311, 360	Lab reports, written assignments, exams, West-E Earth Science test Domain 1 average = 3.11
1.1.5 Earth in the Solar System	PHYS 121 GEOL 120, 121, 360	Lab reports, written assignments, exams - All students passed with a minimum of 70% West-E Earth Science test - Domain 4 average = 2.22
1.1.6 Energy and Earth Systems	GEOG 305, 310 GEOL 120, 121, 220, 360	Lab reports, written assignments, exams, West-E Earth Science test Domains 1-4 average = 2.86
1.1.7 Geochemical Cycles	GEOL 120, 121, 122, 360	Lab reports, written assignments, exams, West-E Earth Science test Domains 1-4 average = 2.86
1.1.8 Origin and Evolution of Earth Systems	PHYS 121 GEOL 121, 122, 311, 360 GEOG 314	Lab reports, written assignments, exams, West-E Earth Science test Domains 1-4 average = 2.86
1.1.9 Origin and Evolution of Universe	PHYS 121 GEOL 120	Lab reports, written assignments, exams, West-E Earth Science test Domain 4 average = 2.22
1.1.10 Supporting Knowledge: Chemistry	CHEM151	Lab reports, written assignments, exams All students passed with a minimum of 70%
1.1.11 Supporting Knowledge: Biology	GEOL 121, 122	Lab reports, written assignments, exams All students passed with a minimum of 70%
1.1.12 Supporting Knowledge: Physics	PHYS121	Lab reports, written assignments, exams

		All students passed with a minimum of 70%
1.2 Inquiry -	SCED 390 GEOL 120, 121, 360, 311, 390	Lab reports, written assignments, exams - All students passed with a minimum of 70% West-E Earth Science test -Domain 5 average = 3.22
1.3 Nature and Context of Science	CHEM151 GEOL120,121, 360, 390 GEOG314	Lab reports, written assignments, exams, West-E Earth Science test Domain 5 average = 3.22
2.0 Common Core – Instructional Methodology: 2.1 Skills of Teaching: Earth Science teachers know the equipment, materials, and preparation required in the science laboratory.	CHEM151 GEOL120,121, 390 GEOG314 PHYS121 SCED 390	Lab reports, written assignments, exams - All students passed with a minimum of 70%
2.2 Curriculum – Earth Science teachers know the science curriculum. Understand the application of student learning goals to design lessons that target state standards (i.e., read with comprehension, write with skill, and communicate effectively with responsibility in a variety of ways and settings, know and apply the core concepts).	CHEM151 GEOL120,121, 390 GEOG314 PHYS121 SCED 390	Lab reports, written assignments, exams - All students passed with a minimum of 70% SCED 390 - average on curriculum activities = 87.4% GEOL 390 – average curriculum activities = 91.8%
2.3 Social Context - Earth Science teachers know the relation between science and the community and know the human and institutional resources in the community.	CHEM151 GEOL120,121, 220, 360, 390 GEOG314 PHYS121	Lab reports, written assignments, exams -- All students passed with a minimum of 70%
2.3.1 Earth Science teachers can relate science to the community and to use human and institutional resources in the community to advance the education of their students in earth science.	CHEM151 GEOL120,121, 360, 390 GEOG314 PHYS121	Lab reports, written assignments, exams -- All students passed with a minimum of 70%
2.4 Assessment - The earth science teacher knows a variety of contemporary assessment strategies to evaluate the intellectual, social, and personal development of the learner in all aspects of earth science.	GEOL 390 SCED 390 EDUC 303	SCED 390 average grade on assessment assignment = 82% GEOL 390 average grade on assessment assignments = 86.3%
2.5 Environment for Learning – Earth science teachers know safe and supportive learning environments reflecting high expectations for the success of all students.	EDUC 426-Student Teaching, EDUC 341	TPA – Numbers taken are too low to report even in aggregate form.
3.0 Common Core – Professional Practice: 3.1 Earth Science teachers have a knowledge base that prepares them for professional practice.	GEOL390 SCED 390	Various assignments - all students passed with a minimum of 70%

3.2 Earth Science teachers participate in the professional community, improving practice through their personal actions, education, and development.	EDUC 426 – Student Teaching	TPA – Numbers taken are too low to report even in aggregate form.
--	-----------------------------	---

- Due to less than 5 students graduating per year, data from the West-E and Geol 390 are aggregated over the last 3 school years.
- Interpretation of West-E domain scores:
For multiple choice questions, the examinee answered correctly:

- 1=few or none of the questions
- 2=some of the questions
- 3=many of the questions
- 4=most or all of the questions

For constructed-response (essay or long-answer) assignments, the examinee’s responses:

- 1=inadequately addressed the assigned topic
- 2=addressed the assigned topic in a very limited way
- 3=generally addressed the assigned topic
- 4=fully addressed the assigned topic
- 0=was blank or unscorable

Report on Departmental Assessment, Data Driven Decision Making

The only recent change to the program has been from requiring GEOL 307 to GEOL 311. Geol 307 is no longer being taught in the department because of staffing needs and low enrollment in 307. Geol 311 is a slightly higher level Earth Materials class. It is hard to determine what effect this class change has had, due to low numbers of students that it has so far affected. It is thought that passing GEOL 311 will only increase the students understanding of Earth Materials.

From the limited data aggregated over the last 3 years, domain 4 (Universe and the Solar System) from the West-E appears to be the weak area for our students. The student average for domain 4 is 2.22, which means the students on average are addressing the topic in a limited way. There is only one class (PHYS 121) that focuses on these core concepts. Before any program changes are warranted, more data would be required. Over the next year we will be watching how our students perform on this particular domain in the West-E.