

CORE SCIENCE CONTENT-AREA STANDARDS [AAT Science]

	Course Title** and Number and/or Experiences	Assessment Activities***: Evidence/Artifact [R = required, O = optional]
<p>STANDARD 1 - Science as Inquiry</p> <p>The competent science teacher understands scientific inquiry and has the ability to conduct scientific inquiry.</p>		
<p>Knowledge Indicators: The competent science teacher</p> <p>1A. Understands assumptions, processes, purposes, requirements and tools of scientific inquiry.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><i>**Two science core courses fulfill the general education requirement. The second two core courses plus the additional two designation courses complete the major AAT Science Concentration requirements.</i></p> <p><i>***The assessment evidence applies to all courses for a specific dimension sub-standard.</i></p> </div>	<p>Core Courses: <i>(Select two as Gen Ed.)</i></p> <p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Biology Designation Courses: <i>(Choose two in addition to the remaining two core course options.)</i></p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p> <p>Chemistry Designation Courses: <i>(Choose two in addition to the remaining two core course options.)</i></p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Chem 2xx: Organic Chemistry (Majors course w/Lab)</p> <p>Physics Designation Courses: <i>(Choose two in addition to the remaining two core course options.)</i></p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>10 Action Research Project—Original action research project documents and professor feedback with completed rubric. May also include photos/video/posters/etc.</p> <p>[O]</p> <p>7 Standardized Exit Exams: ACS General Chemistry, Biology (?), Physics MPEX—Official Memo to candidate with sub-area and total results.</p>

<p>1B. Understands mathematical processes and tools for collecting, managing, and communicating information.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Chem 2xx: Organic Chemistry (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>And</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p>
<p>1C. Understands different approaches to conducting scientific investigations.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Chem 2xx: Organic Chemistry (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>10 Action Research Project—Original action research project documents and professor feedback with completed rubric. May also include</p>

	<p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	photos/video/posters/etc.
<p>Performance Indicators: The competent science teacher</p> <p>1D. Plans and conducts scientific investigations using appropriate tools and technology.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Chem 2xx: Organic Chemistry (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>10 Action Research Project—Original action research project documents and professor feedback with completed rubric. May also include photos/video/posters/etc.</p>
<p>1E. Applies mathematical and statistical methods to collect, analyze, and communicate results of investigations.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>And</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic</p>

	<p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Chem 2xx: Organic Chemistry (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p>
1F. Displays, illustrates, and defends the results of an investigation.	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Chem 2xx: Organic Chemistry (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p>
1G. Uses evidence and logic in developing proposed explanations that address scientific questions and hypotheses.	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p>	<p>[R]</p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>And</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with</p>

	<p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Chem 2xx: Organic Chemistry (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>10 Action Research Project—Original action research project documents and professor feedback with completed rubric. May also include photos/video/posters/etc.</p>
<p>STANDARD 2 - Technological Design</p> <p>The competent science teacher understands the concepts, principles and processes of technological design.</p>		
<p>Knowledge Indicators: The competent science teacher</p> <p>2A. Understands the processes, capabilities, limitations and implications of technology and technological design and redesign.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Chem 2xx: Organic Chemistry (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment--Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>

<p>2B. Understands technology and technological design as the use of tools throughout human history.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Chem 2xx: Organic Chemistry (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p><i>Performance Indicators: The competent science teacher</i></p> <p>2C. Identifies real world problems or needs to be solved through technological design.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Chem 2xx: Organic Chemistry (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>

	<p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	
<p>2D. Addresses a problem situation by identifying a design problem, proposing a design solution, implementing the solution, evaluating the solution, revising the design upon evaluation, and communicating the design and the process.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Chem 2xx: Organic Chemistry (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>And</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>2E. Identifies the inquiry process in the investigation of past, current and potential technological designs.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p>	<p>[R]</p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p>

	<p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Chem 2xx: Organic Chemistry (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>STANDARD 3 - Molecular and Cellular Sciences</p> <p>The competent science teacher understands and can apply concepts that explain the cell, molecular basis of heredity, and biological evolution.</p>		
<p>Knowledge Indicators: The competent science teacher</p> <p>3A. Understands viral, subcellular and cellular structure and function.</p>	<p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-</p>

		<p>designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>3B. Understands the nature and function of the gene with emphasis on the molecular basis of inheritance and gene expression.</p>	<p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>3C. Understands the processes of change at the microscopic and macroscopic levels.</p>	<p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p>	<p>[R]</p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p>

	Biol 1xx/2xx: Biology Elective (Majors course w/Lab)	
<p>Performance Indicators: The competent science teacher</p> <p>3D. Describes the processes of the cell cycle and analyze the transmission of genetic information.</p>	<p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>3E. Demonstrates an understanding of organelles, cells, tissues, organs and organ systems and their function.</p>	<p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p>
<p>3F. Identifies scientific evidence from various sources to demonstrate knowledge of theories about processes of biological evolution.</p>	<p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p>	<p>[R]</p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p>

	<p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p>	<p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>3G. Demonstrates the ability to use instruments or to explain functions of the technologies used to study the life sciences at the molecular and cellular level.</p>	<p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>

<p>STANDARD 4 - Organisms and Ecosystems</p> <p>The competent science teacher understands and can apply concepts that describe how living things interact with each other and with their environment.</p>		
<p>Knowledge Indicators: The competent science teacher</p> <p>4A. Understands how living and nonliving factors interact with one another and with their environment.</p>	<p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p> <p>[O]</p> <p>7 Standardized Exit Exams: Biology (?)—Official Memo to candidate with sub-area and total results.</p>
<p>4B. Understands the strategies and adaptations used by organisms to obtain</p>	<p>Biol 1xx: General Biology I (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment--</p>

<p>the basic requirements of life.</p>	<p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p>	<p>Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p> <p>[O]</p> <p>7 Standardized Exit Exams: Biology (?)—Official Memo to candidate with sub-area and total results.</p>
<p>4C. Understands that all environments are comprised of interrelated dynamic systems.</p>	<p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—</p>

		<p>Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p> <p>[O]</p> <p>7 Standardized Exit Exams: Biology (?)—Official Memo to candidate with sub-area and total results.</p>
<p>4D. Understands the concepts of populations, communities, ecosystems, ecoregions, and the role of biodiversity in living systems.</p>	<p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p>

		<p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p> <p>[O]</p> <p>7 Standardized Exit Exams: Biology (?)—Official Memo to candidate with sub-area and total results.</p>
<p>4E. Understands that humans are living organisms who uniquely interact with the environment.</p>	<p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor</p>

		<p>feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p> <p>[O]</p> <p>7 Standardized Exit Exams: Biology (?)—Official Memo to candidate with sub-area and total results.</p>
<p>Performance Indicators: The competent science teacher</p> <p>4F. Develops a model or explanation that shows the relationships within the environment.</p>	<p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p> <p>[O]</p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p>
<p>4G. Demonstrates an understanding of how communities, ecosystems, and ecoregions change.</p>	<p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p>	<p>[R]</p> <p>3 Reflection— Candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices with professor feedback and completed rubric.</p>

	<p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p>	<p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>10 Action Research Project—Original action research project documents and professor feedback with completed rubric. May also include photos/video/posters/etc.</p>
<p>4H. Demonstrates an understanding of the human as a living organism comparable to other life forms and functions.</p>	<p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>3 Reflection— Candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices with professor feedback and completed rubric.</p> <p><i>And</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p> <p><i>or</i></p>

		<p>10 Action Research Project—Original action research project documents and professor feedback with completed rubric. May also include photos/video/posters/etc.</p>
<p>4I. Describes physical, ecological, and behavioral factors that influence homeostasis within an organism and interrelationships among organisms.</p>	<p>Biol 1xx: General Biology I (Majors course w/Lab) Biol 2xx: Anatomy (Majors course w/Lab) Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p> <p>[O]</p> <p>3 Reflection— Candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices with professor feedback and completed rubric.</p>

<p>4J. Demonstrates the ability to use instruments or to explain functions of the technologies used to study the life sciences at the organism and ecosystem level.</p>	<p>Biol 1xx: General Biology I (Majors course w/Lab) Biol 2xx: Anatomy (Majors course w/Lab) Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p>	<p>[R] 4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric. <i>or</i> 5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric. <i>or</i> 6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric. <i>or</i> 9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>STANDARD 5 - Matter and Energy</p> <p>The competent science teacher understands the nature and properties of energy in its various forms, and the processes by which energy is exchanged and/or transformed.</p>		
<p>Knowledge Indicators: The competent science teacher</p> <p>5A. Understands the atomic and nuclear structure of matter and the relationship to chemical and physical properties.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab) Chem 1xx: General Chemistry I (Majors course w/Lab) Phys 1xx: General Physics I (Majors course w/Lab) Chem 1xx: General Chemistry II (Majors course w/Lab) Chem 2xx: Organic Chemistry (Majors course w/Lab) Phys 1xx: General Physics II (Majors course w/Lab)</p>	<p>[R] 4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric. <i>or</i> 5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric. <i>or</i> 6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor</p>

	<p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>5B. Understands the principle of conservation as it applies to mass, charge, momentum, and energy.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Chem 2xx: Organic Chemistry (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>10 Action Research Project—Original action research project documents and</p>

		professor feedback with completed rubric. May also include photos/video/posters/etc.
5C. Understands the cause and effect of chemical reactions in natural and manufactured systems.	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Chem 2xx: Organic Chemistry (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
5D. Understands the characteristics and relationships among thermal, acoustical, radiant, electrical, chemical, mechanical, and nuclear energies.	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept</p>

	<p>(Majors course w/Lab)</p> <p>Chem 2xx: Organic Chemistry (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>Performance Indicators: The competent science teacher</p> <p>5E. Analyzes the properties of materials in relation to their chemical or physical structures and evaluate uses of the materials based on their properties.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Chem 2xx: Organic Chemistry (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and</p>

		<p>professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>5F. Explains conservation of mass and energy and explains interactions of energy with matter including changes in state.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Chem 2xx: Organic Chemistry (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>5G. Will use kinetic theory and the laws of thermodynamics to explain energy transformations.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Chem 2xx: Organic Chemistry (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>5H. Analyzes atomic and nuclear reactions in</p>	<p>Phy Sci 1xx: Introduction to Earth</p>	<p>[R]</p>

<p>natural and man-made energy systems.</p>	<p>Science (w/ Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Chem 2xx: Organic Chemistry (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>5I. Demonstrates the ability to use instruments or to explain functions of the technologies used to study matter and energy.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Chem 2xx: Organic Chemistry (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p>

		<p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>STANDARD 6 - Force and Motion</p> <p>The competent science teacher understands and applies the concepts that describe force and motion and the principles that explain them.</p>		
<p>Knowledge Indicators: The competent science teacher</p> <p>6A. Understands the concepts and interrelationships of position, time, velocity, and acceleration.</p>	<p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-</p>

		<p>designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>6B. Understands the concepts and interrelationships of force (including gravity and friction), inertia, work, power, energy, and momentum.</p>	<p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>6C. Understands the nature and properties of electricity and magnetism.</p>	<p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p>

	<p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>6D. Understands the nature and properties of mechanical and electromagnetic waves.</p>	<p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p>

		<p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>Performance Indicators: The competent science teacher</p> <p>6E. Describes and predicts motions of bodies in inertial and accelerated frames of reference, in one and two dimensions in a physical system with association to the basic theories of force and motion.</p>	<p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p>
<p>6F. Analyzes and predicts motions and interactions involving forces, within the context of conservation of energy and/or momentum.</p>	<p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p>
<p>6G. Describes the effects of gravitational, electromagnetic, and nuclear forces in real life situations.</p>	<p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p>	<p>[R]</p> <p>3 Reflection— Candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices with professor feedback and completed rubric.</p>

	<p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>6H. Analyzes and predicts the behavior of mechanical and electromagnetic waves under varying physical conditions.</p>	<p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p>
<p>6I. Demonstrates abilities to use instruments or to explain functions of the technologies used to study force and motion.</p>	<p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic</p>

		<p>format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>STANDARD 7 - The Earth</p> <p>The competent science teacher understands the dynamic nature of the Earth and recognizes that its features and structures result from natural processes.</p>		
<p>Knowledge Indicators: The competent science teacher</p> <p>7A. Understands the structure and composition of the Earth's land, water and atmospheric systems.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p>

		<p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
7B. Understands the transfer of energy within and among Earth's land, water and atmospheric systems.	Phy Sci 1xx: Introduction to Earth Science (w/ Lab)	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
7C. Understands the scope of geologic time and the continuing physical changes of	Phy Sci 1xx: Introduction to Earth Science (w/ Lab)	<p>[R]</p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of</p>

<p>the Earth through time.</p>		<p>presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>7D. Understands the interrelationships between living organisms and Earth's resources.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p>	<p>[R]</p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>Performance Indicators: The competent science teacher</p> <p>7E. Analyzes and explains large-scale dynamic forces, events, and processes that affect the Earth's land, water and atmospheric systems.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p>	<p>[R]</p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p>

		<p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
7F. Identifies and explains Earth's processes and cycles and cite examples in real-life situations.	Phy Sci 1xx: Introduction to Earth Science (w/ Lab)	<p>[R]</p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
7G. Evaluates scientific theories about Earth's origin and history and how those theories explain contemporary living systems.	Phy Sci 1xx: Introduction to Earth Science (w/ Lab)	<p>[R]</p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p>

		<p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>7H. Identifies and evaluates the uses of Earth's resources.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p>	<p>[R]</p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>7I. Demonstrates abilities to use instruments and/or to explain functions of the technologies used to study the earth sciences.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>And</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p>
<p>STANDARD 8 - The Universe</p> <p>The competent science teacher understands and applies concepts that explain the composition, structure of, and changes in the universe and Earth's place in it.</p>		
<p>Knowledge Indicators: The competent</p>	<p>Phy Sci 1xx: Introduction to Earth</p>	<p>[R]</p>

<p><i>science teacher</i></p> <p>8A. Understands the properties and dynamic nature within the solar system.</p>	<p>Science (w/ Lab)</p>	<p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>8B. Understands the properties and dynamics of extra solar system objects.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p>	<p>[R]</p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>8C. Understands the scientific theories dealing with the origin of the universe.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p>	<p>[R]</p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with</p>

		<p>completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p><i>Performance Indicators: The competent science teacher</i></p> <p>8D. Observes, describes and explains the relative and apparent motions of objects in the sky.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p>	<p>[R]</p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>8E. Compares and analyzes evidence relating to the origin and physical evolution of the universe.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p>	<p>[R]</p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation,</p>

		<p>the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
8F. Compares the processes involved in the life cycle of objects within the galaxies, including their physical and chemical characteristics.	Phy Sci 1xx: Introduction to Earth Science (w/ Lab)	<p>[R]</p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
8G. Demonstrates the ability to use instruments or to explain functions of the technologies and tools used in the study of the space sciences.	Phy Sci 1xx: Introduction to Earth Science (w/ Lab)	<p>[R]</p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p>
<p>STANDARD 9 - Practices of Science</p> <p>The competent science teacher understands and applies accepted practices and implications of science in contemporary and historical contexts.</p>		

<p>Knowledge Indicators: The competent science teacher</p> <p>9A. Understands that the nature of science is a human endeavor characterized as tentative, public, replicable, probabilistic, historic, unique, holistic and empirical.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Chem 2xx: Organic Chemistry (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>3 Reflection— Candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices with professor feedback and completed rubric.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>9B. Understands the definitions of hypotheses, predictions, laws, theories, and principles and the historic and contemporary development and testing of them.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p>	<p>[R]</p> <p>3 Reflection— Candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices with professor feedback and completed rubric.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p>

	<p>Chem 2xx: Organic Chemistry (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
9C. Understands research and reports examples of hypotheses, predictions, laws, theories, and principles, and valid and biased thinking.	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Chem 2xx: Organic Chemistry (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>3 Reflection— Candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices with professor feedback and completed rubric.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
9D. Understands the basis for safety practices and regulations in the study of science.	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course</p>	<p>[R]</p> <p>3 Reflection— Candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices with professor feedback and completed rubric.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p>

	<p>w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Chem 2xx: Organic Chemistry (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>Performance Indicators: The competent science teacher</p> <p>9E. Researches and reports examples of creative and critical thinking skills in scientific research and technological innovation.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Chem 2xx: Organic Chemistry (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept</p>

		Exploration; etc.—Original research paper document and professor feedback with completed rubric.
9F. Researches and reports examples of predictions, hypotheses, and theories in both valid and biased scientific thinking.	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Chem 2xx: Organic Chemistry (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
9G. Researches and reports examples of the development of science through time and the impact of societal values on the nature of science.	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric</p>

	<p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Chem 2xx: Organic Chemistry (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>with Initials and date.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>9H. Documents and practices safety rules and shows evidence of their necessity in the investigation of science.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Chem 2xx: Organic Chemistry (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>And</i></p> <p>11 Laboratory Safety Practicum: Signed Safety Certificate (Valid for only 3 years after completion to ensure of up-to-date readiness.)</p> <p><i>And</i></p> <p>3 Reflection— Candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices with professor feedback and completed rubric.</p>

	Phys 2xx: Physics Elective (Majors course w/Lab)	
9I. Demonstrates the ability to use instruments and is able to explain functions of appropriate safety equipment used to assure and implement safe practices.	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Biol 2xx: Anatomy (Majors course w/Lab)</p> <p>Biol 1xx/2xx: Biology Elective (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Chem 2xx: Organic Chemistry (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p> <p>Phys 2xx: Physics Elective (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>And</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p>
<p>STANDARD 10 - Science, Technology and Society</p> <p>The competent science teacher understands the interaction among science, technology and society including historical and contemporary development of major scientific ideas and technological innovations.</p>		
<p>Knowledge Indicators: The competent science teacher</p> <p>10A. Understands the ways that science and technology affect people's everyday lives, societal values and systems, the</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Biol 1xx: General Biology I (Majors course w/Lab)</p>	<p>[R]</p> <p>3 Reflection— Candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices with professor feedback and completed rubric.</p>

<p>environment, new knowledge and technologies throughout history.</p>	<p>Chem 1xx: General Chemistry I (Majors course w/Lab) Phys 1xx: General Physics I (Majors course w/Lab) Chem 1xx: General Chemistry II (Majors course w/Lab) Phys 1xx: General Physics II (Majors course w/Lab)</p>	<p><i>or</i> 9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>10B. Understands the processes and effects of scientific and technological breakthroughs and their effect on other fields of study, careers and job markets.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab) Biol 1xx: General Biology I (Majors course w/Lab) Chem 1xx: General Chemistry I (Majors course w/Lab) Phys 1xx: General Physics I (Majors course w/Lab) Chem 1xx: General Chemistry II (Majors course w/Lab) Phys 1xx: General Physics II (Majors course w/Lab)</p>	<p>[R] 3 Reflection— Candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices with professor feedback and completed rubric. <i>or</i> 9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p><i>Performance Indicators: The competent science teacher</i> 10C. Evaluates the efficacy of criteria to determine the effects of policies on local scientific, environmental and technological issues.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab) Biol 1xx: General Biology I (Majors course w/Lab) Chem 1xx: General Chemistry I (Majors course w/Lab) Phys 1xx: General Physics I (Majors course w/Lab) Chem 1xx: General Chemistry II (Majors course w/Lab) Phys 1xx: General Physics II (Majors course w/Lab)</p>	<p>[R] 4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric. <i>or</i> 5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric. <i>or</i> 9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>10D. Investigates and evaluates the credibility of scientific claims made in the media,</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p>	<p>[R]</p>

<p>during public debates, or in advertising or marketing campaigns.</p>	<p>Biol 1xx: General Biology I (Majors course w/Lab) Chem 1xx: General Chemistry I (Majors course w/Lab) Phys 1xx: General Physics I (Majors course w/Lab) Chem 1xx: General Chemistry II (Majors course w/Lab) Phys 1xx: General Physics II (Majors course w/Lab)</p>	<p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric. <i>or</i> 5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric. <i>or</i> 6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric. <i>or</i> 9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>10E. Investigates issues by defining and clearly articulating the scientific, technological and societal connections to be investigated, as well as, evaluating the consequences, implications and potential options for resolution.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab) Biol 1xx: General Biology I (Majors course w/Lab) Chem 1xx: General Chemistry I (Majors course w/Lab) Phys 1xx: General Physics I (Majors course w/Lab) Chem 1xx: General Chemistry II (Majors course w/Lab) Phys 1xx: General Physics II (Majors course w/Lab)</p>	<p>[R] 4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric. <i>or</i> 5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric. <i>or</i> 9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>STANDARD 11 - Unifying Concepts The competent science teacher understands the major unifying concepts of all sciences (systems, order and organization; evidence, models, and explanation; constancy, change, and measurement, evolution and equilibrium;</p>		

form and function), and how these concepts relate to other disciplines, particularly mathematics and the social sciences.		
<p>Knowledge Indicators: The competent science teacher</p> <p>11A. Understands connections within and among the traditional scientific disciplines.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p>	<p>[R]</p> <p>3 Reflection— Candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices with professor feedback and completed rubric.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>11B. Understands fundamental comparability of the processes shared within and among the traditional scientific disciplines.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p>	<p>[R]</p> <p>3 Reflection— Candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices with professor feedback and completed rubric.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with</p>

		completed rubric.
11C. Understands fundamental mathematical language, knowledge and skills.	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>And</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p>
11D. Understands fundamental relationships among the sciences and the social sciences.	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p>	<p>[R]</p> <p>3 Reflection— Candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices with professor feedback and completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>Performance Indicators: The competent science teacher</p> <p>11E. Identifies and describes the application of the unifying concepts in real-life situations.</p>	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p>	<p>[R]</p> <p>3 Reflection— Candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices with professor feedback and completed rubric.</p> <p><i>or</i></p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p>

	<p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p>	<p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
11F. Utilizes the unifying concepts from science, as well as concepts from mathematics, the social sciences, and other disciplines in their teaching.	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p>	<p>[R]</p> <p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p>[O]</p> <p>3 Reflection— Candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices with professor feedback and completed rubric.</p>
11G. Expresses phenomenological relationships in the language of mathematics, solving simple algebraic equations, using scientific notation, constructing and interpreting graphs and using probabilities.	<p>Phy Sci 1xx: Introduction to Earth Science (w/ Lab)</p> <p>Biol 1xx: General Biology I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry I (Majors course w/Lab)</p> <p>Phys 1xx: General Physics I (Majors course w/Lab)</p> <p>Chem 1xx: General Chemistry II (Majors course w/Lab)</p> <p>Phys 1xx: General Physics II (Majors course w/Lab)</p>	<p>[R]</p> <p>1 Performance-based Laboratory: Verification, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples—Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>2 Performance-based Inquiry Laboratory: Experiment design, Skill, or Concept Attainment-- Professor-designed Instructions, Candidate Work Samples— Laboratory Notes/Report/Photo/ Video, Professor Feedback and Completed Rubric with Initials and date.</p> <p><i>or</i></p> <p>4 PowerPoint Presentation: to peers/professor/public—Photo/video of presentation, the presentation in printed (6 slides/page is sufficient) or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>5 Poster Presentation: to peers/professional/public—Photo/video of presentation, the key text printed or electronic format, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p>

		<p>6 Concept Modeling Presentation: to peers/professor/public— Candidate-designed planning notes, candidate reflection on the experience and professor feedback with completed rubric.</p> <p><i>or</i></p> <p>9 Research Paper: Laboratory Experiment, Literature Search, or Concept Exploration; etc.—Original research paper document and professor feedback with completed rubric.</p>
<p>STANDARD 14 - Environment for Learning</p> <p>The competent science teacher can design and manage safe and supportive learning environments in which all students can engage in scientific inquiry and concept development.</p>		
<p>Knowledge Indicators: The competent science teacher</p> <p>14A. Understands liability and negligence, especially as applied to science teaching.</p>	<p>ED/Phy Sci/Bio/Chem 1xx: Early Contextualized Clinical Experience in Science Classrooms</p>	<p>3 Reflection— Candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices with professor feedback and completed rubric.</p> <p><i>or</i></p> <p>Tutoring—Letter from parent/teacher; 6-14 learner work samples (high/medium/low); and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Judging science fair—Letter from parent/teacher; science fair schedule/notice; and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Mentoring science fair student—Letter from parent/teacher; photo of 6-12 learner and candidate with work sample; and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Designing and Implementing a candidate-led workshop for the 6-14 learner—Photo/Video plus letter from parent/teacher/institution/ professional organization; candidate work sample; and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Attending or presenting at a professional conference—Photo/video of presentation, conference documents, and the presentation in printed (6 slides/page is sufficient) or electronic format, and candidate reflection on the experience and the</p>

		<p>impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Publishing an article/book—Submitted version with acceptance letter or actual reprint/copy.</p> <p><i>or</i></p> <p>Providing assistance to a science teacher or other community-based program instructor of 6-12 learners—Letter from teacher; 6-12 learner work samples (high/medium/low); and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p>
<p>14B. Understands procedures for safe and ethical use and care of animals for science instruction.</p>	<p>ED/Phy Sci/Bio/Chem 1xx: Early Contextualized Clinical Experience in Science Classrooms</p> <p>Biol 1xx: General Biology I (Majors course w/Lab)</p>	<p>3 Reflection— Candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices with professor feedback and completed rubric.</p> <p><i>or</i></p> <p>Judging science fair—Letter from parent/teacher; science fair schedule/notice; and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Mentoring science fair student—Letter from parent/teacher; photo of 6-12 learner and candidate with work sample; and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Designing and Implementing a candidate-led workshop for the 6-14 learner— Photo/Video plus letter from parent/teacher/institution/ professional organization; candidate work sample; and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Presenting at a professional conference—Photo/video of presentation, conference documents, and the presentation in printed (6 slides/page is sufficient) or electronic format, and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Publishing an article/book—Submitted version with acceptance letter or actual reprint/copy.</p> <p><i>or</i></p> <p>Providing assistance to a science teacher or other community-based program instructor of 6-12 learners—Letter from teacher; 6-12 learner work samples</p>

		(high/medium/low); and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.
<p>STANDARD 15 - Teaching Science</p> <p>The competent science teacher understands how to guide and facilitate learning using a variety of methods and strategies that encourage students' development of scientific inquiry skills and concepts.</p>		
<p>Performance Indicators: The competent science teacher</p> <p>15C. Implements activities requiring students to collect data, reflect upon their findings, make inferences, and links new ideas to preexisting knowledge.</p>	<p>ED/Phy Sci/Bio/Chem 1xx: Early Contextualized Clinical Experience in Science Classrooms</p>	<p>3 Reflection— Candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices with professor feedback and completed rubric.</p> <p><i>or</i></p> <p>Tutoring—Letter from parent/teacher; 6-14 learner work samples (high/medium/low); and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Judging science fair—Letter from parent/teacher; science fair schedule/notice; and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Mentoring science fair student—Letter from parent/teacher; photo of 6-12 learner and candidate with work sample; and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Designing and Implementing a candidate-led workshop for the 6-14 learner—Photo/Video plus letter from parent/teacher/institution/ professional organization; candidate work sample; and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Attending or presenting at a professional conference—Photo/video of presentation, conference documents, and the presentation in printed (6 slides/page is sufficient) or electronic format, and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Publishing an article/book—Submitted version with acceptance letter or actual reprint/copy.</p>

		<p><i>or</i></p> <p>Providing assistance to a science teacher or other community-based program instructor of 6-12 learners—Letter from teacher; 6-12 learner work samples (high/medium/low); and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p>
<p>15D. Conducts instruction that has appropriate structure with flexibility to allow students to engage in productive inquiry as individuals and groups.</p>	<p>ED/Phy Sci/Bio/Chem 1xx: Early Contextualized Clinical Experience in Science Classrooms</p>	<p>3 Reflection— Candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices with professor feedback and completed rubric.</p> <p><i>or</i></p> <p>Tutoring—Letter from parent/teacher; 6-14 learner work samples (high/medium/low); and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Judging science fair—Letter from parent/teacher; science fair schedule/notice; and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Mentoring science fair student—Letter from parent/teacher; photo of 6-12 learner and candidate with work sample; and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Designing and Implementing a candidate-led workshop for the 6-14 learner—Photo/Video plus letter from parent/teacher/institution/ professional organization; candidate work sample; and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Ppresenting at a professional conference—Photo/video of presentation, conference documents, and the presentation in printed (6 slides/page is sufficient) or electronic format, and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Publishing an article/book—Submitted version with acceptance letter or actual reprint/copy.</p> <p><i>or</i></p> <p>Providing assistance to a science teacher or other community-based program instructor of 6-12 learners—Letter from teacher; 6-12 learner work samples</p>

		(high/medium/low); and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.
15E. Conducts instruction that encourages curiosity, openness to new ideas and data, and skepticism that characterize science.	ED/Phy Sci/Bio/Chem 1xx: Early Contextualized Clinical Experience in Science Classrooms	<p>3 Reflection— Candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices with professor feedback and completed rubric.</p> <p><i>or</i></p> <p>Tutoring—Letter from parent/teacher; 6-14 learner work samples (high/medium/low); and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Judging science fair—Letter from parent/teacher; science fair schedule/notice; and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Mentoring science fair student—Letter from parent/teacher; photo of 6-12 learner and candidate with work sample; and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Designing and Implementing a candidate-led workshop for the 6-14 learner—Photo/Video plus letter from parent/teacher/institution/ professional organization; candidate work sample; and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Presenting at a professional conference—Photo/video of presentation, conference documents, and the presentation in printed (6 slides/page is sufficient) or electronic format, and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Providing assistance to a science teacher or other community-based program instructor of 6-12 learners—Letter from teacher; 6-12 learner work samples (high/medium/low); and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p>
STANDARD 17 - Connections in Teaching Science The competent science teacher can relate		

<p>science to the daily lives and interests of students as well as to the larger framework of human endeavor and to learning in other disciplines.</p>		
<p>Knowledge Indicators: The competent science teacher</p> <p>17A. Understands how students can identify and utilize science concepts in their daily lives.</p>	<p>ED/Phy Sci/Bio/Chem 1xx: Early Contextualized Clinical Experience in Science Classrooms</p>	<p>3 Reflection— Candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices with professor feedback and completed rubric.</p> <p><i>or</i></p> <p>Tutoring—Letter from parent/teacher; 6-14 learner work samples (high/medium/low); and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Judging science fair—Letter from parent/teacher; science fair schedule/notice; and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Mentoring science fair student—Letter from parent/teacher; photo of 6-12 learner and candidate with work sample; and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Designing and Implementing a candidate-led workshop for the 6-14 learner—Photo/Video plus letter from parent/teacher/institution/ professional organization; candidate work sample; and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Providing assistance to a science teacher or other community-based program instructor of 6-12 learners—Letter from teacher; 6-12 learner work samples (high/medium/low); and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p>
<p>17B. Understands the relationship of learning in science to learning in other disciplines.</p>	<p>ED/Phy Sci/Bio/Chem 1xx: Early Contextualized Clinical Experience in Science Classrooms</p>	<p>3 Reflection— Candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices with professor feedback and completed rubric.</p> <p><i>or</i></p> <p>Tutoring—Letter from parent/teacher; 6-14 learner work samples (high/medium/low); and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p>

		<p>Judging science fair—Letter from parent/teacher; science fair schedule/notice; and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Mentoring science fair student—Letter from parent/teacher; photo of 6-12 learner and candidate with work sample; and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Designing and Implementing a candidate-led workshop for the 6-14 learner—Photo/Video plus letter from parent/teacher/institution/ professional organization; candidate work sample; and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Providing assistance to a science teacher or other community-based program instructor of 6-12 learners—Letter from teacher; 6-12 learner work samples (high/medium/low); and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p>
<p>Performance Indicators: The competent science teacher</p> <p>17C. Engages students in the examination of science applications in their personal lives and interests and in the examination of local issues.</p>	<p>ED/Phy Sci/Bio/Chem 1xx: Early Contextualized Clinical Experience in Science Classrooms</p>	<p>3 Reflection— Candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices with professor feedback and completed rubric.</p> <p><i>or</i></p> <p>Tutoring—Letter from parent/teacher; 6-14 learner work samples (high/medium/low); and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Judging science fair—Letter from parent/teacher; science fair schedule/notice; and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Mentoring science fair student—Letter from parent/teacher; photo of 6-12 learner and candidate with work sample; and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Designing and Implementing a candidate-led workshop for the 6-14 learner—Photo/Video plus letter from parent/teacher/institution/ professional organization; candidate work sample; and candidate reflection on the experience and the impact</p>

		<p>on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Providing assistance to a science teacher or other community-based program instructor of 6-12 learners—Letter from teacher; 6-12 learner work samples (high/medium/low); and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p>
17D. Assists students in relating knowledge of other disciplines, particularly mathematics and social sciences, to concepts of science in applications to their personal lives.	ED/Phy Sci/Bio/Chem 1xx: Early Contextualized Clinical Experience in Science Classrooms	<p>3 Reflection— Candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices with professor feedback and completed rubric.</p> <p><i>or</i></p> <p>Tutoring—Letter from parent/teacher; 6-14 learner work samples (high/medium/low); and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Judging science fair—Letter from parent/teacher; science fair schedule/notice; and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Mentoring science fair student—Letter from parent/teacher; photo of 6-12 learner and candidate with work sample; and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Designing and Implementing a candidate-led workshop for the 6-14 learner—Photo/Video plus letter from parent/teacher/institution/ professional organization; candidate work sample; and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Providing assistance to a science teacher or other community-based program instructor of 6-12 learners—Letter from teacher; 6-12 learner work samples (high/medium/low); and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p>
17E. Orients students to potential careers related to applications of scientific and technological knowledge.	ED/Phy Sci/Bio/Chem 1xx: Early Contextualized Clinical Experience in Science Classrooms	<p>3 Reflection— Candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices with professor feedback and completed rubric.</p> <p><i>or</i></p>

		<p>Tutoring—Letter from parent/teacher; 6-14 learner work samples (high/medium/low); and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Mentoring science fair student—Letter from parent/teacher; photo of 6-12 learner and candidate with work sample; and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Designing and Implementing a candidate-led workshop for the 6-14 learner—Photo/Video plus letter from parent/teacher/institution/ professional organization; candidate work sample; and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p> <p><i>or</i></p> <p>Providing assistance to a science teacher or other community-based program instructor of 6-12 learners—Letter from teacher; 6-12 learner work samples (high/medium/low); and candidate reflection on the experience and the impact on the teacher candidate growth in teaching and learning practices.</p>
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