

# AAT Science Matrix

## Secondary Science Model

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Listed below are the standards/indicators identified by the AAT science workgroup as being appropriate for freshmen/sophomore science courses. Suitable science courses are identified for each indicator chosen. Course descriptions and assessment/artifact descriptions are provided prior to the beginning of the matrix. The candidate would choose one of three science major designations: Biology, Chemistry, or Physics.

### Major Core Course Descriptions

All four of the following core courses are required; however, two of the courses can be used to fulfill general education requirements.

▶ **Earth Science**

**IAI: P1 905L or P1 909L – 3 Semester Credit Hours: 3 lecture/3 lab**

Basic processes guiding the formation of Earth's natural landscapes. Map reading, geography and astronomy, earth-sun relations, weather and climates, earth materials, continental drift theory, plate tectonics, energy and mineral resources, rivers, earthquakes, glaciers, and human-environment interactions. May include integrated field trip.

▶ **Introduction to Biological Sciences I**

**IAI: BIO 910 – 4-5 Semester Credit Hours: 4 lecture/2 lab**

(A two or three course sequence). This combination of courses covers all the essential topics in an introductory biology sequence, including Organismal Biology, Ecology, Evolution, and Cellular and Molecular Biology. Course objectives include: an introduction to structure and function of major groups of microorganisms, fungi, animals, and plants; an emphasis on evolutionary relationships and ecological principles, and an introduction to biochemistry, molecular genetics, cell structure, function, and processes. Laboratory required in all courses in the sequence.

Please note: To guarantee easy transfer of credit, students must complete the entire course sequence at the same school before transfer.

▶ **General Chemistry I (Majors Course w/lab)**

**IAI: BIO 906, EGR 961, CHM 911 – 4 Semester Credit Hours**

Atomic theory, stoichiometry, concentration units, gas laws, thermochemistry, properties of elements, bonding, oxidation-reduction, and states of matter.

▶ **General Physics I with Calculus: Lecture and Laboratory**

**IAI: EGR 911, P2 900L, MTH 921 – 4 Semester Credit Hours: 4 lecture/3 lab**

Foundation of physics using calculus as a tool. Kinematics, Newton's laws of motion, energy and momentum conservation, wave motion.

## Other Major Course Requirements

Take the other 2 core courses. In addition, in order to fulfill IAI transfer requirements, take the following supporting classes to complete the second course in the Biology, Chemistry, and Physics sequences:

▶ **Introduction to Biological Sciences II**

**IAI: BIO 910 – 4-5 Semester Credit Hours: 4 lecture/2 lab**

(Continuation of the two or three course sequence). This combination of courses covers all the essential topics in an introductory biology sequence, including Organismal Biology, Ecology, Evolution, and Cellular and Molecular Biology. Course objectives include: an introduction to structure and function of major groups of microorganisms, fungi, animals, and plants; an emphasis on evolutionary relationships and ecological principles, and an introduction to biochemistry, molecular genetics, cell structure, function, and processes. Laboratory required in all courses in the sequence.

Please note: To guarantee easy transfer of credit, students must complete the entire course sequence at the same school before transfer.

▶ **General Chemistry II**

**IAI: BIO 907, CHM 912, NUR 907 – 4 Semester Credit Hours**

Continuation of General Chemistry I. Properties of solutions, descriptive chemistry, kinetics, equilibrium, acid-base theory, electrochemistry, nuclear reactions and radiochemistry.

▶ **General Physics II with Calculus: Lecture and Laboratory**

**IAI: EGR 912 – 4 Semester Credit Hours: 4 lecture/3 lab**

Continuation of PHYS I with Calculus. Laws of thermodynamics, electrostatics, electrical circuits, magnetism.

## Electives

If additional hours are available, choose courses from the following list which best support your area of concentration:

▶ **Organic Chemistry I/II\***

**IAI: BIO 908/909, CHM 913/914, NUR 908/909 – 4-8 Semester Credit Hours**

**\*Please check with your 4-year institution for transfer guidelines.**

Detailed examination of carbon compounds based on modern concepts of molecular structure and reaction mechanisms. Laboratory covers synthesis, purification and characterization of organic compounds.

▶ **General Physics III with Calculus: Lecture and Laboratory**

**IAI: EGR 914 – 4 Semester Credit Hours: 4 lecture/3 lab**

Continuation of Physics II with Calculus. Geometric and physical optics, relativity, atomic and nuclear physics.

- ▶ **Biology/Botany/Zoology/Ecology/Environmental Elective\***      **\*Please check with your 4-year institution for transfer guidelines.**  
**4 Semester Credit Hours: 4 lecture/2 lab**

Any laboratory-based course other than BIO 911, 912, 913, 914, or 915.

#### **General Education Coursework That Should Be Required:**

- ▶ **Calculus I**  
**IAI: M1 900, EGR 901, MTH 901 – 4 Semester Credit Hours**

Limits and continuity, derivatives of algebraic and trigonometric functions, chain rule, applications (such as extreme problems, related rates, graphing), antiderivatives, definite integral applications (such as area, volume, work, force). The TI-83 Graphing Calculator is required for this course.

- ▶ **Calculus II/Statistics/Linear Algebra Elective\***      **\*Please check with your 4-year institution for transfer guidelines.**  
**4 Semester Credit Hours**

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#### **Assessment/Artifact Descriptions**

Listed in the matrix are a variety of "required" and "optional" assessments/artifacts. Detailed descriptions of the required components are found below; the optional evidence is described within the matrix. An assessment/artifact may be designed to meet more than one standard.

#### **Required**

##### **Performance-based Laboratory**

Verification, skill, or concept attainment; professor-designed instructions; candidate work samples – laboratory notes/reports/photos/video; and professor feedback and completed rubric with initials and date.

##### **Performance-based Inquiry Laboratory**

Experiment design, skill, or concept attainment; professor-designed instructions; candidate work samples – laboratory notes/reports/photos/video; and professor feedback and completed rubric with initials and date.

##### **PowerPoint Presentation**

To peers/professor/public; photo/video of presentation, printed (6 slides/page is sufficient) or electronic format; and candidate reflection on the experience and professor feedback with completed rubric.

##### **Poster Presentation**

To peers/professor/public; photo/video of presentation, the key text printed or electronic format; and candidate reflection on the experience and professor feedback with completed rubric.

##### **Concept Modeling Presentation**

To peers/professor/public; candidate-designed planning notes; and candidate reflection on the experience and professor feedback with completed rubric.

**Research Paper**

Laboratory experiment, literature search, or concept exploration, etc. Original research paper document and professor feedback with completed rubric.

**Reflection**

Candidate reflection on the experience and the impact on the candidate growth in teaching and learning practices with professor feedback and completed rubric.

**Action Research Project**

Original action research project documents and professor feedback with completed rubric. May also include photos/videos/posters/etc.

**Laboratory Safety Practicum**

Signed Safety Certificate (valid for only 3 years after completion to ensure up-to-date readiness).

**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.

**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.

**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.

**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.

**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.

**Publishing an Article/Book**

Submitted version with acceptance letter or actual reprint/copy.

**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.

\*\* Two science core courses fulfill the general education requirement. The second two core courses plus the additional major courses comprise the AAT Science Concentration requirements.

\*\*\*The assessment evidence applies to all courses for a specific dimension sub-standard.

Standard	Course Title**	Assessments***/Artifacts
<p><b>Illinois Core Science Standards</b>  <b>Standard 1: Science as Inquiry</b>            The competent science teacher understands scientific inquiry and has the ability to conduct scientific inquiry.</p>		
<p><b>Knowledge Indicators:</b> <i>The competent science teacher</i>            1A. Understands assumptions, processes, purposes, requirements, and tools of scientific inquiry.</p>	<p><b>Core Courses</b> (Select two as General Education)</p> <p><b>Physical Science</b>            Earth Science (w/Lab)</p> <p><b>Biology</b>            Introduction to Biological Sciences I (w/Lab)</p> <p><b>Chemistry</b>            General Chemistry I (w/Lab)</p> <p><b>Physics</b>            General Physics I with Calculus (w/Lab)</p> <p><b>Major Courses</b></p> <p>Introduction to Biological Sciences II (w/Lab)            General Chemistry II (w/Lab)            General Physics II with Calculus (w/Lab)</p> <p><b>Elective Coursework</b></p> <p>Organic Chemistry I/II (w/Lab)            Anatomy and Physiology I (w/Lab)            General Physics III with Calculus (w/Lab)            Biology/Botany/Zoology/Ecology/Environmental Elective (w/Lab)</p>	<p><b>Required</b></p> <p>Performance-based Inquiry Laboratory            OR            Research Paper            OR            Action Research Project</p> <p><b>Optional</b></p> <p>Standardized Exit Exams            • ACS General Chemistry, Biology, Physics;            official memo to candidate with sub-area and total results.</p>

Standard	Course Title**	Assessments***/Artifacts
<p>1B. Understands mathematical processes and tools for collecting, managing, and communicating information.</p>	<p><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Biology</b> Introduction to Biological Sciences I (w/Lab) Introduction to Biological Sciences II (w/Lab) Elective (Majors course w/Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab) Organic Chemistry (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab) Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>Performance-based Laboratory OR Performance-based Inquiry Laboratory AND PowerPoint Presentation OR Poster Presentation</p>
<p>1C. Understands different approaches to conducting scientific investigations.</p>	<p><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Biology</b> Introduction to Biological Sciences I (w/Lab) Introduction to Biological Sciences II (w/Lab) Elective (Majors course w/Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab) Organic Chemistry (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab) Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>Performance-based Laboratory OR Performance-based Inquiry Laboratory OR Research Paper OR Action Research Project</p>

Standard	Course Title**	Assessments***/Artifacts
<p><b>Performance Indicators:</b> <i>The competent science teacher</i>            1D. Plans and conducts scientific investigations using appropriate tools and technology.</p>	<p><b>Physical Science</b>            Earth Science (w/ Lab)</p> <p><b>Biology</b>            Introduction to Biological Sciences I (w/Lab)            Introduction to Biological Sciences II (w/Lab)            Elective (Majors course w/Lab)</p> <p><b>Chemistry</b>            General Chemistry I (w/Lab)            General Chemistry II (w/Lab)            Organic Chemistry (w/Lab)</p> <p><b>Physics</b>            General Physics I with Calculus (w/Lab)            General Physics II Calculus (w/Lab)            Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>Performance-based Laboratory            OR            Performance-based Inquiry Laboratory            OR            Research Paper            OR            Action Research Project</p>
<p>1E. Applies mathematical and statistical methods to collect, analyze, and communicate results of investigations.</p>	<p><b>Physical Science</b>            Earth Science (w/ Lab)</p> <p><b>Biology</b>            Introduction to Biological Sciences I (w/Lab)            Introduction to Biological Sciences II (w/Lab)            Elective (Majors course w/Lab)</p> <p><b>Chemistry</b>            General Chemistry I (w/Lab)            General Chemistry II (w/Lab)            Organic Chemistry (w/Lab)</p> <p><b>Physics</b>            General Physics I with Calculus (w/Lab)            General Physics II Calculus (w/Lab)            Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>Performance-based Laboratory            OR            Performance-based Inquiry Laboratory            AND            PowerPoint Presentation            OR            Poster Presentation</p>

Standard	Course Title**	Assessments***/Artifacts
<p>1F. Displays, illustrates, and defends the results of an investigation.</p>	<p><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Biology</b> Introduction to Biological Sciences I (w/Lab) Introduction to Biological Sciences II (w/Lab) Elective (Majors course w/Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab) Organic Chemistry (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab) Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>PowerPoint Presentation OR Poster Presentation</p>
<p>1G. Uses evidence and logic in developing proposed explanations that address scientific questions and hypotheses.</p>	<p><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Biology</b> Introduction to Biological Sciences I (w/Lab) Introduction to Biological Sciences II (w/Lab) Elective (Majors course w/Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab) Organic Chemistry (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab) Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>Performance-based Inquiry Laboratory AND PowerPoint Presentation OR Poster Presentation OR Research Paper OR Action Research Project</p>

Standard	Course Title**	Assessments***/Artifacts
<p><b>Illinois Core Science Standards</b>  <b>Standard 2: Technological Design</b>  The competent science teacher understands the concepts, principles and processes of technological design.</p>		
<p><b>Knowledge Indicators:</b> <i>The competent science teacher</i>  2A. Understands the processes, capabilities, limitations and implications of technology and technological design and redesign.</p>	<p><b>Physical Science</b>  Earth Science (w/ Lab)</p> <p><b>Biology</b>  Introduction to Biological Sciences I (w/Lab)  Introduction to Biological Sciences II (w/Lab)  Elective (Majors course w/Lab)</p> <p><b>Chemistry</b>  General Chemistry I (w/Lab)  General Chemistry II (w/Lab)  Organic Chemistry (w/Lab)</p> <p><b>Physics</b>  General Physics I with Calculus (w/Lab)  General Physics II Calculus (w/Lab)  Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>Performance-based Laboratory  OR  Research Paper</p>
<p>2B. Understands technology and technological design as the use of tools throughout human history.</p>	<p><b>Physical Science</b>  Earth Science (w/ Lab)</p> <p><b>Biology</b>  Introduction to Biological Sciences I (w/Lab)  Introduction to Biological Sciences II (w/Lab)  Elective (Majors course w/Lab)</p> <p><b>Chemistry</b>  General Chemistry I (w/Lab)  General Chemistry II (w/Lab)  Organic Chemistry (w/Lab)</p> <p><b>Physics</b>  General Physics I with Calculus (w/Lab)  General Physics II Calculus (w/Lab)  Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>PowerPoint Presentation  OR  Poster Presentation  OR  Concept Modeling Presentation  OR  Research Paper</p>

Standard	Course Title**	Assessments***/Artifacts
<p><b>Performance Indicators:</b> <i>The competent science teacher</i>            2C. Identifies real-world problems or needs to be solved through technological design.</p>	<p><b>Physical Science</b>            Earth Science (w/ Lab)</p> <p><b>Biology</b>            Introduction to Biological Sciences I (w/Lab)            Introduction to Biological Sciences II (w/Lab)            Elective (Majors course w/Lab)</p> <p><b>Chemistry</b>            General Chemistry I (w/Lab)            General Chemistry II (w/Lab)            Organic Chemistry (w/Lab)</p> <p><b>Physics</b>            General Physics I with Calculus (w/Lab)            General Physics II Calculus (w/Lab)            Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>Performance-based Laboratory            OR            Concept Modeling Presentation            OR            Research Paper</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><b>Physical Science</b>            Earth Science (w/ Lab)</p> <p><b>Biology</b>            Introduction to Biological Sciences I (w/Lab)            Introduction to Biological Sciences II (w/Lab)            Elective (Majors course w/Lab)</p> <p><b>Chemistry</b>            General Chemistry I (w/Lab)            General Chemistry II (w/Lab)            Organic Chemistry (w/Lab)</p> <p><b>Physics</b>            General Physics I with Calculus (w/Lab)            General Physics II Calculus (w/Lab)            Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>Performance-based Inquiry Laboratory            AND            PowerPoint Presentation            OR            Poster Presentation            OR            Concept Modeling Presentation            OR            Research Paper</p>

Standard	Course Title**	Assessments***/Artifacts
<p>2E. Identifies the inquiry process in the investigation of past, current, and potential technological designs.</p>	<p><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Biology</b> Introduction to Biological Sciences I (w/Lab) Introduction to Biological Sciences II (w/Lab) Elective (Majors course w/Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab) Organic Chemistry (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab) Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>PowerPoint Presentation OR Poster Presentation OR Research Paper</p>
<p><b>Illinois Core Science Standards</b> <b>Standard 3: Molecular and Cellular Sciences</b> The competent science teacher understands and can apply concepts that explain the cell, molecular basis of heredity, and biological evolution.</p>		
<p><b>Knowledge Indicators:</b> <i>The competent science teacher</i> 3A. Understands viral, subcellular and cellular structure and function.</p>	<p><b>Biology</b> Introduction to Biological Sciences I (w/Lab) Introduction to Biological Sciences II (w/Lab) Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>Performance-based Laboratory OR Performance-based Inquiry Laboratory OR PowerPoint Presentation OR Poster Presentation OR Concept Modeling Presentation OR Research Paper</p>

Standard	Course Title**	Assessments***/Artifacts
3B. Understands the nature and function of the gene, with emphasis on the molecular basis of inheritance and gene expression.	<b>Biology</b> Introduction to Biological Sciences I (w/Lab) Introduction to Biological Sciences II (w/Lab) Elective (Majors course w/Lab)	<u><b>Required</b></u>  Performance-based Laboratory OR Performance-based Inquiry Laboratory OR PowerPoint Presentation OR Poster Presentation OR Concept Modeling Presentation OR Research Paper
3C. Understands the processes of change at the microscopic and macroscopic levels.	<b>Biology</b> Introduction to Biological Sciences I (w/Lab) Introduction to Biological Sciences II (w/Lab) Anatomy and Physiology I (Majors course w/Lab) Elective (Majors course w/Lab)	<u><b>Required</b></u>  Concept Modeling Presentation
<b>Performance Indicators:</b> <i>The competent science teacher</i> 3D. Describes the processes of the cell cycle and analyzes the transmission of genetic information.	<b>Biology</b> Introduction to Biological Sciences I (w/Lab) Introduction to Biological Sciences II (w/Lab) Anatomy and Physiology I (Majors course w/Lab) Elective (Majors course w/Lab)	<u><b>Required</b></u>  PowerPoint Presentation OR Poster Presentation OR Research Paper
3E. Demonstrates an understanding of organelles, cells, tissues, organs, and organ systems and their function.	<b>Biology</b> Introduction to Biological Sciences I (w/Lab) Introduction to Biological Sciences II (w/Lab) Elective (Majors course w/Lab)	<u><b>Required</b></u>  PowerPoint Presentation OR Poster Presentation OR Concept Modeling Presentation
3F. Identifies scientific evidence from various sources to demonstrate knowledge of theories about processes of biological evolution.	<b>Biology</b> Introduction to Biological Sciences I (w/Lab) Introduction to Biological Sciences II (w/Lab) Elective (Majors course w/Lab)	<u><b>Required</b></u>  PowerPoint Presentation OR Poster Presentation OR Research Paper

Standard	Course Title**	Assessments***/Artifacts
<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><b>Biology</b>            Introduction to Biological Sciences I (w/Lab)            Introduction to Biological Sciences II (w/Lab)            Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>Performance-based Laboratory            OR            Performance-based Inquiry Laboratory            OR            PowerPoint Presentation            OR            Poster Presentation            OR            Concept Modeling Presentation            OR            Research Paper</p>
<p><b>Illinois Core Science Standards</b>  <b>Standard 4: Organisms and Ecosystems</b>            The competent science teacher understands and can apply concepts that describe how living things interact with each other and with their environment.</p>		
<p><b>Knowledge Indicators:</b> <i>The competent science teacher</i>            4A. Understands how living and nonliving factors interact with one another and with their environment.</p>	<p><b>Biology</b>            Introduction to Biological Sciences I (w/Lab)            Introduction to Biological Sciences II (w/Lab)            Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>Performance-based Laboratory            OR            Performance-based Inquiry Laboratory            OR            PowerPoint Presentation            OR            Poster Presentation            OR            Concept Modeling Presentation            OR            Research Paper</p> <p><b>Optional</b></p> <p>Standardized Exit Exams            • Biology – official memo to candidate with sub-area and total results.</p>

Standard	Course Title**	Assessments***/Artifacts
<p>4B. Understands the strategies and adaptations used by organisms to obtain the basic requirements of life.</p>	<p><b>Biology</b>            Introduction to Biological Sciences I (w/Lab)            Introduction to Biological Sciences II (w/Lab)            Elective (Majors course w/Lab)</p>	<p><b><u>Required</u></b></p> <p>Performance-based Laboratory            OR            Performance-based Inquiry Laboratory            OR            PowerPoint Presentation            OR            Poster Presentation            OR            Concept Modeling Presentation            OR            Research Paper</p> <p><b><u>Optional</u></b></p> <p>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><b>Biology</b>            Introduction to Biological Sciences I (w/Lab)            Introduction to Biological Sciences II (w/Lab)            Elective (Majors course w/Lab)</p>	<p><b><u>Required</u></b></p> <p>Performance-based Laboratory            OR            Performance-based Inquiry Laboratory            OR            PowerPoint Presentation            OR            Poster Presentation            OR            Concept Modeling Presentation            OR            Research Paper</p> <p><b><u>Optional</u></b></p> <p>Standardized Exit Exams            • Biology – official memo to candidate with sub-area and total results.</p>

Standard	Course Title**	Assessments***/Artifacts
<p>4D. Understands the concepts of populations, communities, ecosystems, ecoregions, and the role of biodiversity in living systems.</p>	<p><b>Biology</b>            Introduction to Biological Sciences I (w/Lab)            Introduction to Biological Sciences II (w/Lab)            Elective (Majors course w/Lab)</p>	<p><b><u>Required</u></b></p> <p>Performance-based Laboratory            OR            Performance-based Inquiry Laboratory            OR            PowerPoint Presentation            OR            Poster Presentation            OR            Concept Modeling Presentation            OR            Research Paper</p> <p><b><u>Optional</u></b></p> <p>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><b>Biology</b>            Introduction to Biological Sciences I (w/Lab)            Introduction to Biological Sciences II (w/Lab)            Elective (Majors course w/Lab)</p>	<p><b><u>Required</u></b></p> <p>Performance-based Laboratory            OR            Performance-based Inquiry Laboratory            OR            PowerPoint Presentation            OR            Poster Presentation            OR            Concept Modeling Presentation            OR            Research Paper</p> <p><b><u>Optional</u></b></p> <p>Standardized Exit Exams            • Biology – official memo to candidate with sub-area and total results.</p>

Standard	Course Title**	Assessments***/Artifacts
<p><b>Performance Indicators:</b> <i>The competent science teacher</i>            4F. Develops a model or explanation that shows the relationships within the environment.</p>	<p><b>Biology</b>            Introduction to Biological Sciences I (w/Lab)            Introduction to Biological Sciences II (w/Lab)            Elective (Majors course w/Lab)</p>	<p><b><u>Required</u></b>            PowerPoint Presentation            OR            Poster Presentation            OR            Concept Modeling Presentation            OR            Research Paper</p> <p><b><u>Optional</u></b>            Performance-based Inquiry Laboratory</p>
<p>4G. Demonstrates an understanding of how communities, ecosystems, and ecoregions change.</p>	<p><b>Biology</b>            Introduction to Biological Sciences I (w/Lab)            Introduction to Biological Sciences II (w/Lab)            Anatomy and Physiology I (Majors course w/Lab)            Elective (Majors course w/Lab)</p>	<p><b><u>Required</u></b>            Reflection            OR            PowerPoint Presentation            OR            Poster Presentation            OR            Research Paper            OR            Action Research Project</p>
<p>4H. Demonstrates an understanding of the human as a living organism comparable to other life forms and functions.</p>	<p><b>Biology</b>            Introduction to Biological Sciences I (w/Lab)            Introduction to Biological Sciences II (w/Lab)            Elective (Majors course w/Lab)</p>	<p><b><u>Required</u></b>            Reflection            OR            PowerPoint Presentation            OR            Poster Presentation            OR            Research Paper            OR            Action Research Project</p>

Standard	Course Title**	Assessments***/Artifacts
4I. Describes physical, ecological, and behavioral factors that influence homeostasis within an organism and interrelationships among organisms.	<b>Biology</b> Introduction to Biological Sciences I (w/Lab) Introduction to Biological Sciences II (w/Lab) Elective (Majors course w/Lab)	<u><b>Required</b></u> PowerPoint Presentation OR Poster Presentation OR Concept Modeling Presentation OR Research Paper  <u><b>Optional</b></u> Reflection
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.	<b>Biology</b> Introduction to Biological Sciences I (w/Lab) Introduction to Biological Sciences II (w/Lab) Elective (Majors course w/Lab)	<u><b>Required</b></u> PowerPoint Presentation OR Poster Presentation OR Concept Modeling Presentation OR Research Paper
<b>Illinois Core Science Standards</b> <b>Standard 5: Matter and Energy</b> 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.		
<b>Knowledge Indicators:</b> <i>The competent science teacher</i> 5A. Understands the atomic and nuclear structure of matter and the relationship to chemical and physical properties.	<b>Physical Science</b> Earth Science (w/ Lab)  <b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab) Organic Chemistry (w/Lab)  <b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab) Elective (Majors course w/Lab)	<u><b>Required</b></u> PowerPoint Presentation OR Poster Presentation OR Concept Modeling Presentation OR Research Paper

Standard	Course Title**	Assessments***/Artifacts
5B. Understands the principle of conservation as it applies to mass, charge, momentum, and energy.	<p><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab) Organic Chemistry (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab) Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>Performance-based Laboratory OR Performance-based Inquiry Laboratory OR PowerPoint Presentation OR Poster Presentation OR Concept Modeling Presentation OR Research Paper OR Action Research Project</p>
5C. Understands the cause and effect of chemical reactions in natural and manufactured systems.	<p><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab) Organic Chemistry (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab) Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>Performance-based Laboratory OR Performance-based Inquiry Laboratory OR PowerPoint Presentation OR Poster Presentation OR Concept Modeling Presentation OR Research Paper</p>
5D. Understands the characteristics and relationships among thermal, acoustical, radiant, electrical, chemical, mechanical, and nuclear energies.	<p><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab) Organic Chemistry (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab) Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>Performance-based Laboratory OR Performance-based Inquiry Laboratory OR PowerPoint Presentation OR Poster Presentation OR Concept Modeling Presentation OR Research Paper</p>

Standard	Course Title**	Assessments***/Artifacts
<p><b>Performance Indicators:</b> <i>The competent science teacher</i></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><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab) Organic Chemistry (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab) Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>Performance-based Laboratory OR Performance-based Inquiry Laboratory OR PowerPoint Presentation OR Poster Presentation OR Research Paper</p>
<p>5F. Explains conservation of mass and energy and explains interactions of energy with matter, including changes in state.</p>	<p><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab) Organic Chemistry (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab) Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>PowerPoint Presentation OR Poster Presentation OR Research Paper</p>
<p>5G. Uses kinetic theory and the laws of thermodynamics to explain energy transformations.</p>	<p><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab) Organic Chemistry (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab) Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>PowerPoint Presentation OR Poster Presentation OR Concept Modeling Presentation OR Research Paper</p>

Standard	Course Title**	Assessments***/Artifacts
5H. Analyzes atomic and nuclear reactions in natural and man-made energy systems.	<p><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab) Organic Chemistry (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab) Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>Performance-based Laboratory OR Performance-based Inquiry Laboratory OR PowerPoint Presentation OR Poster Presentation OR Research Paper</p>
5I. Demonstrates the ability to use instruments or to explain functions of the technologies used to study matter and energy.	<p><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab) Organic Chemistry (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab) Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>Performance-based Laboratory OR Performance-based Inquiry Laboratory OR PowerPoint Presentation OR Poster Presentation OR Concept Modeling Presentation OR Research Paper</p>
<p><b>Illinois Core Science Standards</b> <b>Standard 6: Force and Motion</b> The competent science teacher understands and applies the concepts that describe force and motion and the principles that explain them.</p>		
<p><b>Knowledge Indicators:</b> <i>The competent science teacher</i> 6A. Understands the concepts and interrelationships of position, time, velocity, and acceleration.</p>	<p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab) Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>Performance-based Laboratory OR Performance-based Inquiry Laboratory OR PowerPoint Presentation OR Poster Presentation OR Concept Modeling Presentation OR Research Paper</p>

Standard	Course Title**	Assessments***/Artifacts
<p>6B. Understands the concepts and interrelationships of force (including gravity and friction), inertia, work, power, energy, and momentum.</p>	<p><b>Physics</b>            General Physics I with Calculus (w/Lab)            General Physics II Calculus (w/Lab)            Elective (Majors course w/Lab)</p>	<p><b><u>Required</u></b>            Performance-based Laboratory            OR            Performance-based Inquiry Laboratory            OR            PowerPoint Presentation            OR            Poster Presentation            OR            Concept Modeling Presentation            OR            Research Paper</p>
<p>6C. Understands the nature and properties of electricity and magnetism.</p>	<p><b>Physics</b>            General Physics I with Calculus (w/Lab)            General Physics II Calculus (w/Lab)            Elective (Majors course w/Lab)</p>	<p><b><u>Required</u></b>            Performance-based Laboratory            OR            Performance-based Inquiry Laboratory            OR            PowerPoint Presentation            OR            Poster Presentation            OR            Concept Modeling Presentation            OR            Research Paper</p>
<p>6D. Understands the nature and properties of mechanical and electromagnetic waves.</p>	<p><b>Physics</b>            General Physics I with Calculus (w/Lab)            General Physics II Calculus (w/Lab)            Elective (Majors course w/Lab)</p>	<p><b><u>Required</u></b>            Performance-based Laboratory            OR            Performance-based Inquiry Laboratory            OR            PowerPoint Presentation            OR            Poster Presentation            OR            Concept Modeling Presentation            OR            Research Paper</p>

Standard	Course Title**	Assessments***/Artifacts
<p><b>Performance Indicators:</b> <i>The competent science teacher</i></p> <p>6E. Describes and predicts motions of bodies in inertial and accelerated frames of reference and in one and two dimensions in a physical system with association to the basic theories of force and motion.</p>	<p><b>Physics</b>            General Physics I with Calculus (w/Lab)            General Physics II Calculus (w/Lab)            Elective (Majors course w/Lab)</p>	<p><b><u>Required</u></b></p> <p>Performance-based Laboratory            OR            Performance-based Inquiry Laboratory</p>
<p>6F. Analyzes and predicts motions and interactions involving forces within the context of conservation of energy and/or momentum.</p>	<p><b>Physics</b>            General Physics I with Calculus (w/Lab)            General Physics II Calculus (w/Lab)            Elective (Majors course w/Lab)</p>	<p><b><u>Required</u></b></p> <p>Performance-based Laboratory            OR            Performance-based Inquiry Laboratory</p>
<p>6G. Describes the effects of gravitational, electromagnetic, and nuclear forces in real life situations.</p>	<p><b>Physics</b>            General Physics I with Calculus (w/Lab)            General Physics II Calculus (w/Lab)            Elective (Majors course w/Lab)</p>	<p><b><u>Required</u></b></p> <p>Reflection            OR            PowerPoint Presentation            OR            Poster Presentation            OR            Research Paper</p>
<p>6H. Analyzes and predicts the behavior of mechanical and electromagnetic waves under varying physical conditions.</p>	<p><b>Physics</b>            General Physics I with Calculus (w/Lab)            General Physics II Calculus (w/Lab)            Elective (Majors course w/Lab)</p>	<p><b><u>Required</u></b></p> <p>Performance-based Laboratory            OR            Performance-based Inquiry Laboratory</p>
<p>6I. Demonstrates abilities to use instruments or to explain functions of the technologies used to study force and motion.</p>	<p><b>Physics</b>            General Physics I with Calculus (w/Lab)            General Physics II Calculus (w/Lab)            Elective (Majors course w/Lab)</p>	<p><b><u>Required</u></b></p> <p>Performance-based Laboratory            OR            Performance-based Inquiry Laboratory            OR            PowerPoint Presentation            OR            Poster Presentation            OR            Concept Modeling Presentation            OR            Research Paper</p>

Standard	Course Title**	Assessments***/Artifacts
<p><b>Illinois Core Science Standards</b>  <b>Standard 7: The Earth</b>  The competent science teacher understands the dynamic nature of the Earth and recognizes that its features and structures result from natural processes.</p>		
<p><b>Knowledge Indicators:</b> <i>The competent science teacher</i>  7A. Understands the structure and composition of the Earth's land, water and atmospheric systems.</p>	<p><b>Physical Science</b>  Earth Science (w/ Lab)</p>	<p><b>Required</b>  Performance-based Laboratory  OR  Performance-based Inquiry Laboratory  OR  PowerPoint Presentation  OR  Poster Presentation  OR  Concept Modeling Presentation  OR  Research Paper</p>
<p>7B. Understands the transfer of energy within and among Earth's land, water and atmospheric systems.</p>	<p><b>Physical Science</b>  Earth Science (w/ Lab)</p>	<p><b>Required</b>  Performance-based Laboratory  OR  Performance-based Inquiry Laboratory  OR  PowerPoint Presentation  OR  Poster Presentation  OR  Concept Modeling Presentation  OR  Research Paper</p>
<p>7C. Understands the scope of geologic time and the continuing physical changes of the Earth through time.</p>	<p><b>Physical Science</b>  Earth Science (w/ Lab)</p>	<p><b>Required</b>  PowerPoint Presentation  OR  Poster Presentation  OR  Concept Modeling Presentation  OR  Research Paper</p>

Standard	Course Title**	Assessments***/Artifacts
7D. Understands the interrelationships between living organisms and Earth's resources.	<b>Physical Science</b> Earth Science (w/ Lab)	<b><u>Required</u></b>  PowerPoint Presentation OR Poster Presentation OR Concept Modeling Presentation OR Research Paper
<b>Performance Indicators:</b> <i>The competent science teacher</i> 7E. Analyzes and explains large-scale dynamic forces, events, and processes that affect the Earth's land, water and atmospheric systems.	<b>Physical Science</b> Earth Science (w/ Lab)	<b><u>Required</u></b>  PowerPoint Presentation OR Poster Presentation OR Concept Modeling Presentation OR Research Paper
7F. Identifies and explains Earth's processes and cycles and cites examples in real-life situations.	<b>Physical Science</b> Earth Science (w/ Lab)	<b><u>Required</u></b>  PowerPoint Presentation OR Poster Presentation OR Research Paper
7G. Evaluates scientific theories about Earth's origin and history and how those theories explain contemporary living systems.	<b>Physical Science</b> Earth Science (w/ Lab)	<b><u>Required</u></b>  PowerPoint Presentation OR Poster Presentation OR Research Paper
7H. Identifies and evaluates the uses of Earth's resources.	<b>Physical Science</b> Earth Science (w/ Lab)	<b><u>Required</u></b>  PowerPoint Presentation OR Poster Presentation OR Research Paper

Standard	Course Title**	Assessments***/Artifacts
7I. Demonstrates abilities to use instruments and/or to explain functions of the technologies used to study the earth sciences.	<b>Physical Science</b> Earth Science (w/ Lab)	<b>Required</b>  Performance-based Laboratory OR Performance-based Inquiry Laboratory AND Concept Modeling Presentation
<p><b>Illinois Core Science Standards</b>  <b>Standard 8: The Universe</b>  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><b>Knowledge Indicators:</b> <i>The competent science teacher</i>  8A. Understands the properties and dynamic nature of the solar system.</p>	<b>Physical Science</b> Earth Science (w/Lab)	<b>Required</b>  PowerPoint Presentation OR Poster Presentation OR Concept Modeling Presentation OR Research Paper
8B. Understands the properties and dynamics of objects external to the solar system.	<b>Physical Science</b> Earth Science (w/ Lab)	<b>Required</b>  PowerPoint Presentation OR Poster Presentation OR Concept Modeling Presentation OR Research Paper
8C. Understands the scientific theories dealing with the origin of the universe.	<b>Physical Science</b> Earth Science (w/ Lab)	<b>Required</b>  PowerPoint Presentation OR Poster Presentation OR Concept Modeling Presentation OR Research Paper

Standard	Course Title**	Assessments***/Artifacts
<p><b>Performance Indicators:</b> <i>The competent science teacher</i>            8D. Observes, describes, and explains the relative and apparent motions of objects in the sky.</p>	<p><b>Physical Science</b>            Earth Science (w/ Lab)</p>	<p><b><u>Required</u></b>            PowerPoint Presentation            OR            Poster Presentation            OR            Concept Modeling Presentation            OR            Research Paper</p>
<p>8E. Compares and analyzes evidence relating to the origin and physical evolution of the universe.</p>	<p><b>Physical Science</b>            Earth Science (w/ Lab)</p>	<p><b><u>Required</u></b>            PowerPoint Presentation            OR            Poster Presentation            OR            Concept Modeling Presentation            OR            Research Paper</p>
<p>8F. Compares the processes involved in the life cycle of objects within the galaxies, including their physical and chemical characteristics.</p>	<p><b>Physical Science</b>            Earth Science (w/ Lab)</p>	<p><b><u>Required</u></b>            PowerPoint Presentation            OR            Poster Presentation            OR            Concept Modeling Presentation            OR            Research Paper</p>
<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.</p>	<p><b>Physical Science</b>            Earth Science (w/ Lab)</p>	<p><b><u>Required</u></b>            Concept Modeling Presentation</p>
<p><b>Illinois Core Science Standards</b>  <b>Standard 9: Practices of Science</b>            The competent science teacher understands and applies accepted practices and implications of science in contemporary and historical contexts.</p>		

Standard	Course Title**	Assessments***/Artifacts
<p><b>Knowledge Indicators:</b> <i>The competent science teacher</i></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><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Biology</b> Introduction to Biological Sciences I (w/Lab) Introduction to Biological Sciences II (w/Lab) Elective (Majors course w/Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab) Organic Chemistry (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab) Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>Reflection OR PowerPoint Presentation OR Poster Presentation OR Concept Modeling Presentation OR Research Paper</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><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Biology</b> Introduction to Biological Sciences I (w/Lab) Introduction to Biological Sciences II (w/Lab) Elective (Majors course w/Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab) Organic Chemistry (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab) Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>Reflection OR PowerPoint Presentation OR Poster Presentation OR Concept Modeling Presentation OR Research Paper</p>

Standard	Course Title**	Assessments***/Artifacts
<p>9C. Understands research and reports examples of hypotheses, predictions, laws, theories, and principles, and valid and biased thinking.</p>	<p><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Biology</b> Introduction to Biological Sciences I (w/Lab) Introduction to Biological Sciences II (w/Lab) Elective (Majors course w/Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab) Organic Chemistry (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab) Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>Reflection OR PowerPoint Presentation OR Poster Presentation OR Concept Modeling Presentation OR Research Paper</p>
<p>9D. Understands the basis for safety practices and regulations in the study of science.</p>	<p><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Biology</b> Introduction to Biological Sciences I (w/Lab) Introduction to Biological Sciences II (w/Lab) Elective (Majors course w/Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab) Organic Chemistry (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab) Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>Reflection OR PowerPoint Presentation OR Poster Presentation OR Concept Modeling Presentation OR Research Paper</p>

Standard	Course Title**	Assessments***/Artifacts
<p><b>Performance Indicators:</b> <i>The competent science teacher</i></p> <p>9E. Researches and reports examples of creative and critical thinking skills in scientific research and technological innovation.</p>	<p><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Biology</b> Introduction to Biological Sciences I (w/Lab) Introduction to Biological Sciences II (w/Lab) Elective (Majors course w/Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab) Organic Chemistry (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab) Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>Performance-based Laboratory OR Performance-based Inquiry Laboratory OR PowerPoint Presentation OR Poster Presentation OR Concept Modeling Presentation OR Research Paper</p>
<p>9F. Researches and reports examples of predictions, hypotheses, and theories in both valid and biased scientific thinking.</p>	<p><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Biology</b> Introduction to Biological Sciences I (w/Lab) Introduction to Biological Sciences II (w/Lab) Elective (Majors course w/Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab) Organic Chemistry (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab) Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>Performance-based Laboratory OR Performance-based Inquiry Laboratory OR PowerPoint Presentation OR Poster Presentation OR Concept Modeling Presentation OR Research Paper</p>

Standard	Course Title**	Assessments***/Artifacts
<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>	<p><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Biology</b> Introduction to Biological Sciences I (w/Lab) Introduction to Biological Sciences II (w/Lab) Elective (Majors course w/Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab) Organic Chemistry (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab) Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>Performance-based Laboratory OR Performance-based Inquiry Laboratory OR PowerPoint Presentation OR Poster Presentation OR Concept Modeling Presentation OR Research Paper</p>
<p>9H. Documents and practices safety rules and shows evidence of their necessity in the investigation of science.</p>	<p><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Biology</b> Introduction to Biological Sciences I (w/Lab) Introduction to Biological Sciences II (w/Lab) Elective (Majors course w/Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab) Organic Chemistry (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab) Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>Performance-based Laboratory OR Performance-based Inquiry Laboratory AND Laboratory Safety Practicum AND Reflection</p>

Standard	Course Title**	Assessments***/Artifacts
<p>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>	<p><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Biology</b> Introduction to Biological Sciences I (w/Lab) Introduction to Biological Sciences II (w/Lab) Elective (Majors course w/Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab) Organic Chemistry (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab) Elective (Majors course w/Lab)</p>	<p><b>Required</b></p> <p>Performance-based Laboratory OR Performance-based Inquiry Laboratory AND PowerPoint Presentation OR Poster Presentation OR Concept Modeling Presentation</p>
<p><b>Illinois Core Science Standards</b> <b>Standard 10: Science, Technology and Society</b> 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><b>Knowledge Indicators:</b> <i>The competent science teacher</i> 10A. Understands the ways that science and technology affect people's everyday lives, societal values, and systems; the environment; new knowledge; and technologies throughout history.</p>	<p><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Biology</b> Introduction to Biological Sciences I (w/Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab)</p>	<p><b>Required</b></p> <p>Reflection OR Research Paper</p>

Standard	Course Title**	Assessments***/Artifacts
<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><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Biology</b> Introduction to Biological Sciences I (w/Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab)</p>	<p><b>Required</b></p> <p>Reflection OR Research Paper</p>
<p><b>Performance Indicators:</b> <i>The competent science teacher</i></p> <p>10C. Evaluates the efficacy of criteria for determining the effects of policies on local, State, national, and global environmental and technological issues.</p>	<p><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Biology</b> Introduction to Biological Sciences I (w/Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab)</p>	<p><b>Required</b></p> <p>PowerPoint Presentation OR Poster Presentation OR Research Paper</p>

Standard	Course Title**	Assessments***/Artifacts
<p>10D. Investigates and evaluates the credibility of scientific claims made in the media, during public debates, or in advertising or marketing campaigns.</p>	<p><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Biology</b> Introduction to Biological Sciences I (w/Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab)</p>	<p><b>Required</b></p> <p>PowerPoint Presentation OR Poster Presentation OR Concept Modeling Presentation OR Research Paper</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><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Biology</b> Introduction to Biological Sciences I (w/Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab)</p>	<p><b>Required</b></p> <p>PowerPoint Presentation OR Poster Presentation OR Research Paper</p>
<p><b>Illinois Core Science Standards</b> <b>Standard 11: Unifying Concepts</b> 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; form and function), and how these concepts relate to other disciplines, particularly mathematics and the social sciences.</p>		

Standard	Course Title**	Assessments***/Artifacts
<p><b>Knowledge Indicators:</b> <i>The competent science teacher</i></p> <p>11A. Understands connections within and among the traditional scientific disciplines.</p>	<p><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Biology</b> Introduction to Biological Sciences I (w/Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab)</p>	<p><b>Required</b></p> <p>Reflection OR PowerPoint Presentation OR Poster Presentation OR Research Paper</p>
<p>11B. Understands fundamental comparability of the processes shared within and among the traditional scientific disciplines.</p>	<p><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Biology</b> Introduction to Biological Sciences I (w/Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab)</p>	<p><b>Required</b></p> <p>Reflection OR PowerPoint Presentation OR Poster Presentation OR Research Paper</p>

Standard	Course Title**	Assessments***/Artifacts
<p>11C. Understands fundamental mathematical language, knowledge and skills.</p>	<p><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Biology</b> Introduction to Biological Sciences I (w/Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab)</p>	<p><b>Required</b></p> <p>Performance-based Laboratory OR Performance-based Inquiry Laboratory AND Concept Modeling Presentation</p>
<p>11D. Understands fundamental relationships among the sciences and the social sciences.</p>	<p><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Biology</b> Introduction to Biological Sciences I (w/Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab)</p>	<p><b>Required</b></p> <p>Reflection OR Concept Modeling Presentation OR Research Paper</p>

Standard	Course Title**	Assessments***/Artifacts
<p><b>Performance Indicators:</b> <i>The competent science teacher</i></p> <p>11E. Identifies and describes the application of the unifying concepts in real-life situations.</p>	<p><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Biology</b> Introduction to Biological Sciences I (w/Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab)</p>	<p><b><u>Required</u></b></p> <p>Reflection OR Concept Modeling Presentation OR Research Paper</p>
<p>11F. Utilizes the unifying concepts from science, as well as concepts from mathematics, the social sciences, and other disciplines in his or her teaching.</p>	<p><b>Physical Science</b> Earth Science (w/ Lab)</p> <p><b>Biology</b> Introduction to Biological Sciences I (w/Lab)</p> <p><b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab)</p> <p><b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab)</p>	<p><b><u>Required</u></b></p> <p>Concept Modeling Presentation</p> <p><b><u>Optional</u></b></p> <p>Reflection</p>

Standard	Course Title**	Assessments***/Artifacts
11G. Expresses phenomenological relationships in the language of mathematics, solving simple algebraic equations, using scientific notation, constructing and interpreting graphs and using probabilities.	<b>Physical Science</b> Earth Science (w/ Lab)  <b>Biology</b> Introduction to Biological Sciences I (w/Lab)  <b>Chemistry</b> General Chemistry I (w/Lab) General Chemistry II (w/Lab)  <b>Physics</b> General Physics I with Calculus (w/Lab) General Physics II Calculus (w/Lab)	<b>Required</b>  Performance-based Laboratory OR Performance-based Inquiry Laboratory OR PowerPoint Presentation OR Poster Presentation OR Concept Modeling Presentation OR Research Paper
<b>Illinois Core Science Standards</b> <b>Standard 12: Curriculum in Science</b> The competent science teacher understands how to develop learning outcomes for science instruction that incorporate State and national frameworks for teaching science and how to select appropriate curriculum materials to meet the standards-based outcomes.		
<b>Knowledge Indicators: <i>The competent science teacher</i></b> 12A. Understands the local, State and national goals and standards for science education.		
12B. Understands the relationship of science concepts to the developmental level of students in classrooms.		
12C. Understands how to articulate science instruction across units and from year to year.		
<b>Performance Indicators: <i>The competent science teacher</i></b> 12D. Identifies how an instructional design relates to local, State, and national goals and standards for science.		
12E. Identifies appropriate curricular materials from a variety of sources and selects those that meet the developmentally appropriate, standards-led instructional outcomes.		

Standard	Course Title**	Assessments***/Artifacts
12F. Demonstrates the ability to articulate learning across and among units of instruction, courses in science, and other disciplines.		
<p><b>Illinois Core Science Standards</b>  <b>Standard 13: Planning for Instruction in Science</b>  The competent science teacher understands how to plan learning experiences that utilize an appropriate variety of instructional methods and strategies that allow students to develop significant concepts in science and the ability to engage in scientific reasoning.</p>		
<p><b>Knowledge Indicators:</b> <i>The competent science teacher</i>  13A. Understands how to use materials from the students' environment to help them use inquiry strategies to build concepts.</p>		
13B. Understands the appropriate use of various strategies of direct instruction, concept development, inquiry and problem solving that lead to knowledge and skills for scientific reasoning.		
13C. Understands how concepts are developed in students' minds and how to address misconceptions that students have developed from prior experiences.		
<p><b>Performance Indicators:</b> <i>The competent science teacher</i>  13D. Plans instruction that allows students to develop understanding of significant concepts and skills in science through hands-on experiences with real materials.</p>		
13E. Plans instruction that incorporates a variety of methods and strategies for learning, including demonstrations, the laboratory, and out -of-class resources.		
13F. Plans instruction utilizing instructional technology, instructional materials, and scientific equipment.		

Standard	Course Title**	Assessments***/Artifacts
13G. Plans instructional activities that create opportunities for students to test, modify, and sometimes abandon previous ideas about science.		
<p><b>Illinois Core Science Standards</b>  <b>Standard 14: Environment for Learning</b>  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><b>Knowledge Indicators:</b> <i>The competent science teacher</i>  14A. Understands liability and negligence, especially as applied to science teaching.</p>	<p><b>Education/Physical Science/Biology/Chemistry</b>  Early contextualized clinical experience in a science classroom</p>	<p><b>Required</b>  Reflection OR  Tutoring OR  Judging Science Fair OR  Mentoring Science Fair Student OR  Designing and Implementing a Candidate-Led Workshop for the 6-14 Learner  OR  Attending or Presenting at a Professional Conference  OR  Publishing an Article/Book  OR  Providing Assistance to a Science Teacher or Other Community-Based Program Instructor of 6-12 Learners</p>
14B. Understands procedures for safe and ethical use and care of animals for science instruction.	<p><b>Education/Physical Science/Biology/Chemistry</b>  Early contextualized clinical experience in a science classroom</p> <p><b>Biology</b>  Introduction to Biological Sciences I (w/Lab)</p>	<p><b>Required</b>  Reflection  OR  Judging Science Fair  OR  Mentoring Science Fair Student  OR  Designing and Implementing a Candidate-Led Workshop for the 6-14 Learner  OR  Presenting at a Professional Conference  OR  Publishing an Article/Book  OR  Providing Assistance to a Science Teacher or Other Community-Based Program Instructor of 6-12 Learners</p>

Standard	Course Title**	Assessments*** / Artifacts
<p><b>Performance Indicators:</b> <i>The competent science teacher</i></p> <p>14C. Designs and assesses learning environments to utilize safe practices to prevent potential problems of liability and negligence regarding the inventory, storage, and disposal of chemicals, resources, and equipment.</p>		
<p>14D. Develops a set of criteria to measure and assesses the optimum learning environment that promotes scientific inquiry and learning.</p>		
<p>14E. Develops procedures to adapt learning environments to meet students' special needs.</p>		
<p><b>Illinois Core Science Standards</b>  <b>Standard 15: Teaching Science</b>  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><b>Knowledge Indicators:</b> <i>The competent science teacher</i></p> <p>15A. Understands the appropriate use of strategies for questioning, facilitating, and coaching to help students develop significant concepts, problem-solving skills, and scientific habits of mind.</p>		
<p>15B. Understands the teacher's role in different teaching strategies, including concept development, inquiry, and direct instruction.</p>		
<p><b>Performance Indicators:</b> <i>The competent science teacher</i></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><b>Education/Physical Science/Biology/Chemistry</b>  Early contextualized clinical experience in a science classroom</p>	<p><b>Required</b></p> <p>Reflection OR  Tutoring OR  Judging Science Fair OR  Mentoring Science Fair Student OR  Designing and Implementing a Candidate-Led Workshop for the 6-14 Learner OR  Attending or Presenting at a Professional Conference OR  Publishing an Article/Book OR  Providing Assistance to a Science Teacher/Other Community-Based Instructor of 6-12 Learners</p>

Standard	Course Title**	Assessments***/Artifacts
<p>15D. Conducts instruction that has appropriate structure with flexibility to allow students to engage in productive inquiry as individuals and groups.</p>	<p><b>Education/Physical Science/Biology/Chemistry</b> Early contextualized clinical experience in a science classroom</p>	<p><b>Required</b> Reflection OR Tutoring OR Judging Science Fair OR Mentoring Science Fair Student OR Designing and Implementing a Candidate-Led Workshop for the 6-14 Learner OR Presenting at a Professional Conference OR Publishing an Article/Book OR Providing Assistance to a Science Teacher or Other Community-Based Program Instructor of 6-12 Learners</p>
<p>15E. Conducts instruction that encourages curiosity, openness to new ideas and data, and skepticism that characterize science.</p>	<p><b>Education/Physical Science/Biology/Chemistry</b> Early contextualized clinical experience in a science classroom</p>	<p><b>Required</b> Reflection OR Tutoring OR Judging Science Fair OR Mentoring Science Fair Student OR Designing and Implementing a Candidate-Led Workshop for the 6-14 Learner OR Presenting at a Professional Conference OR Providing Assistance to a Science Teacher or Other Community-Based Program Instructor of 6-12 Learners</p>
<p><b>Illinois Core Science Standards</b> <b>Standard 16: Assessment</b> The competent science teacher understands standards-based science assessment designs, purposes, and analysis strategies, including technological collection capabilities and performance assessments.</p>		

Standard	Course Title**	Assessments***/Artifacts
<b>Knowledge Indicators:</b> <i>The competent science teacher</i>		
16A. Understands the alignment of student learning standards, instructional strategies, and local curriculum in the development of assessment tools and strategies.		
16B. Understands the value of assessment data in guiding and changing instruction in science classrooms.		
16C. Understands the importance of communicating criteria for success to students.		
16D. Understands the importance and impact of state and local assessment policies.		
<b>Performance Indicators:</b> <i>The competent science teacher</i>		
16E. Plans and conducts assessment to evaluate scientific inquiry assessment tasks in multiple disciplines.		
16F. Plans and conducts assessment to evaluate technological design assessment tasks in multiple disciplines.		
16G. Plans and conducts assessment to evaluate scientific case study/issue investigation assessment tasks in multiple disciplines.		
16H. Plans and conducts assessment to evaluate student understanding using a variety of tools and strategies.		
16I. Designs assessment tasks with clearly articulated criteria for student impact and program evaluation.		
16J. Evaluates assessment data to propose responses to program evaluation and potential improvement.		

Standard	Course Title**	Assessments***/Artifacts
<p><b>Illinois Core Science Standards</b>  <b>Standard 17: Connections in Teaching Science</b>  The competent science teacher can relate 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><b>Knowledge Indicators:</b> <i>The competent science teacher</i>  17A. Understands how students can identify and utilize science concepts in their daily lives.</p>	<p><b>Education/Physical Science/Biology/Chemistry</b>  Early contextualized clinical experience in a science classroom</p>	<p><b>Required</b>  Reflection OR  Tutoring OR  Judging Science Fair OR  Mentoring Science Fair Student OR  Designing and Implementing a Candidate-Led Workshop for the 6-14 Learner OR  Providing Assistance to a Science Teacher or Other Community-Based Program Instructor of 6-12 Learners</p>
<p>17B. Understands the relationship of learning in science to learning in other disciplines.</p>	<p><b>Education/Physical Science/Biology/Chemistry</b>  Early contextualized clinical experience in a science classroom</p>	<p><b>Required</b>  Reflection OR  Tutoring OR  Judging Science Fair OR  Mentoring Science Fair Student OR  Designing and Implementing a Candidate-Led Workshop for the 6-14 Learner OR  Providing Assistance to a Science Teacher or Other Community-Based Program Instructor of 6-12 Learners</p>
<p><b>Performance Indicators:</b> <i>The competent science teacher</i>  17C. Engages students in the examination of science applications in their personal lives and interests and in the examination of local issues.</p>	<p><b>Education/Physical Science/Biology/Chemistry</b>  Early contextualized clinical experience in a science classroom</p>	<p><b>Required</b>  Reflection  OR  Tutoring  OR  Judging Science Fair  OR  Mentoring Science Fair Student  OR  Designing and Implementing a Candidate-Led Workshop for the 6-14 Learner  OR  Providing Assistance to a Science Teacher or Other Community-Based Program Instructor of 6-12 Learners</p>

Standard	Course Title**	Assessments***/Artifacts
17D. Assists students in relating knowledge of other disciplines, particularly mathematics and social sciences, to concepts of science in applications to their personal lives.	<b>Education/Physical Science/Biology/Chemistry</b> Early contextualized clinical experience in a science classroom	<u><b>Required</b></u> Reflection OR Tutoring OR Judging Science Fair OR Mentoring Science Fair Student OR Designing and Implementing a Candidate-Led Workshop for the 6-14 Learner OR Providing Assistance to a Science Teacher or Other Community-Based Program Instructor of 6-12 Learners
17E. Orients students to potential careers related to applications of scientific and technological knowledge.	<b>Education/Physical Science/Biology/Chemistry</b> Early contextualized clinical experience in a science classroom	<u><b>Required</b></u> Reflection OR Tutoring OR Mentoring Science Fair Student OR Designing and Implementing a Candidate-Led Workshop for the 6-14 Learner OR Providing Assistance to a Science Teacher or Other Community-Based Program Instructor of 6-12 Learners
<b>Illinois Core Science Standards</b> <b>Standard 18: Learning Science and the Community</b> The competent science teacher can make effective use of human and institutional resources beyond the classroom.		
<b>Knowledge Indicators:</b> <i>The competent science teacher</i> 18A. Understands applications of science concepts and inquiry to the context of a community.		
18B. Understands how parents and other community members and institutions support science learning in the classroom.		

Standard	Course Title**	Assessments***/Artifacts
18C. Understands how to use the resources of the student's community to support inquiry.		
<b>Performance Indicators:</b> <i>The competent science teacher</i>		
18D. Uses data about a community in conducting learning activities in science.		
18E. Conducts activities that involve parents and other members of the community in the science program.		
18F. Utilizes individuals and agencies that provide science education in the community in the science program.		
18G. Develops and tests a community resource inventory, including its non-formal learning opportunities, business/industry connections, and parent/community resources.		
18H. Uses synchronous and asynchronous telecommunication capabilities to collaborate with community members and other experts as an integral component to projects.		
<b>Illinois Core Science Standards</b> <b>Standard 19: Content Reading</b> The competent science teacher understands the process of reading and demonstrates instructional abilities to teach reading in the content area of science.		
<b>Knowledge Indicators:</b> <i>The competent science teacher</i>		
19A. Understands that the reading process is the construction of meaning through the interactions of the reader's background knowledge and experiences, the information in the text, and the purpose of the reading situation.		
19B. Recognizes the relationships among the four language arts (reading, writing, listening, and speaking), and knows how to provide opportunities to integrate these through instruction.		

Standard	Course Title**	Assessments***/Artifacts
19C. Understands how to design, select, modify, and evaluate materials in terms of the reading needs of the learner.		
19D. Understands the importance of and encourages the use of literature for adolescents in the curriculum and for independent reading.		
19E. Understands the relationship between oral and silent reading.		
19F. Understands the role of subject-area vocabulary in developing reading comprehension.		
19G. Understands the importance of the unique study strategies required of the specific content area in developing reading comprehension.		
19H. Understands the importance of the relationship between assessment and instruction in planning.		
<b>Performance indicators: <i>The competent science teacher</i></b> 19I. Plans and teaches lessons for students that develop comprehension of content-area materials through instructional practices that include analyzing critically, evaluating sources, and synthesizing and summarizing material.		
19J. Plans and teaches lessons on how to monitor comprehension and correct confusions and misunderstandings that arise during reading.		
19K. Plans and models use of comprehension strategies before, during, and after reading of text.		
19L. Provides opportunities for students to develop content-area vocabulary through instructional practices that develop connections and relationships among words, use of context clues, and understanding of connotative and denotative meaning of words.		

Standard	Course Title**	Assessments***/Artifacts
19M. Plans and teaches lessons that encourage students to write about the content read in order to improve understanding.		
19N. Plans and teaches lessons to help students develop study strategies that include previewing and preparing to read text effectively, recognizing organizational patterns unique to informational text, and using graphic organizers as an aid for recalling information.		
19O. Plans and teaches units that require students to carry out research or inquiry using multiple texts, including electronic resources.		
19P. Provides continuous monitoring of students' progress through observations, work samples, and various informal reading assessments.		
19Q. Analyzes and evaluates the quality and appropriateness of instructional materials in terms of readability, content, length, format, illustrations, and other pertinent factors.		
19R. Promotes the development of an environment that includes classroom libraries that foster reading.		