Office of the
State Superintendent of Education

District of Columbia Standards
for
Post-Baccalaureate Non-Degree
Educator Preparation Programs

Division of Elementary and Secondary Education
Educator Licensure and Accreditation
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I. Introduction

This document presents the District of Columbia's standards for organizations and institutions seeking State accreditation as providers of state-only teacher preparation programs. Standards for the specific subject area programs offered by these organizations and institutions are also presented herein. The standards in this document are specifically intended for institutions and organizations which provide post-baccalaureate, non-degree educator preparation programs, and which prepare practitioners at the "initial licensure" or certification level. Organizations and institutions which demonstrate that they meet the Organizational Standards and the Subject Area Program Standards for the programs they offer will be eligible to recommend teacher and/or administrator candidates for licensure in the District of Columbia.

In accordance with the procedures and requirements published in the Request for Applications - State-Approved Educator Preparation Programs, organizations and institutions seeking State accreditation through this process shall provide a detailed description and evidence of how they will meet these standards in preparing educators in the disciplines for which the applicant organization is applying for approval. Organizations applying for approval of programs in Educational Administration and Leadership shall provide a detailed description of how they will prepare candidates for school leadership positions.

The District of Columbia Office of the State Superintendent of Education (OSSE) recognizes and encourages multiple pathways to teacher preparation and welcomes those enthusiastic about teaching the District of Columbia's children—whatever their current professional experience—into the community of educational practice. OSSE honors the commitment that draws so many talented people into this field, and we are confident that these and other professional standards will help foster a unified vision of excellence in the District of Columbia, with a variety of well-designed professional pathways into the education profession.

II. Organizational Standards

Institutions and organizations seeking State-Only Accreditation and approval for post-baccalaureate non-degree programs that prepare and recommend candidates for licensure as teachers and administrators shall be required to demonstrate that they meet the following organizational standards. The Standards that follow are an adapted version of the 2007 Professional Standards of the National Council for the Accreditation of Teacher Education (NCATE).

Organizational Standard 1 Candidate Knowledge, Skills and Professional Dispositions *Candidates preparing to work in schools as teachers or other school professionals know and demonstrate the content knowledge, pedagogical content knowledge and skills, pedagogical and professional knowledge and skills, and professional dispositions necessary to help all students learn. Assessments indicate that candidates meet professional and state standards.*	
Description	**Indicator**
1a. Pedagogical Content Knowledge and Skills for Teacher Candidates	**Eighty percent or more of the organization's program candidates pass the state's content examinations for licensure prior to program entry.** Teacher candidates: • Know the content that they plan to teach • Can explain important principles and concepts delineated in professional and state standards. • Understand the relationship of content and content- specific pedagogy delineated in professional and state standards. • Have a broad knowledge of instructional strategies that draws upon content and pedagogical knowledge and skills delineated in professional and state standards to help all students learn. • Facilitate student learning of the content through presentation of the content in clear and meaningful ways and through the integration of technology. • Are able to select and use a broad range of instructional strategies and technologies that promote student learning and are able to clearly explain the choices they make in their practice.
1b. Professional and Pedagogical Knowledge and Skills for Teacher Candidates	Teacher candidates: • Can apply the professional and pedagogical knowledge and skills delineated in professional, state, and institutional standards to facilitate learning. • Have a thorough understanding of and consider the school, family, and community contexts in which they work and the prior experience of students to develop meaningful learning experiences. • Know major schools of thought about schooling, teaching, and learning. • Are able to analyze educational research findings and incorporate new information into their practice as appropriate. • Reflect on their practice and are able to identify their strengths and areas of needed improvement. • Engage in professional activities. • Collaborate with members of the professional community to create meaningful learning experiences for all students. • Are aware of current research and policies related to schooling, teaching, learning, and best practices. • Are able to analyze educational research and policies and can explain the implications for their own practice and for the profession.

1c. Student Learning for	Teacher candidates:

Teacher Candidates	• Assess and analyze student learning, make appropriate adjustments to instruction, and monitor student progress. • Focus on student learning. • Are able to develop and implement meaningful learning experiences for students based on their developmental levels and prior experience. • Analyze student, classroom, and school performance data and make data driven decisions about strategies for teaching and learning so that all students learn. • Are aware of and utilize school and community resources that support student learning.
1d. Knowledge and Skills for Other School Professionals	Candidates for other professional school roles have an adequate understanding of the knowledge expected in their fields and delineated in professional, state, and institutional standards. Candidates: • Know their students, families, and communities; • Use data and current research to inform their practices; • Use technology in their practices; • Support student learning through their professional services. • Know and implement state and federal educator quality requirements.
1e. Student Learning for Other School Professionals	Candidates: • Are able to create positive environments for student learning. • Understand and build upon the development levels of students with whom they work; the diversity of students' families and communities; and the policy contexts within which they work.
1f. Professional Dispositions for All Candidates	Candidates: • Demonstrate classroom behaviors that are consistent with the ideal of fairness and the belief that all students can learn. • Work with students, families, colleagues and communities reflect these professional dispositions.

Organizational Standard 2 **Assessment System and Organization Evaluation** *The organization has an assessment system that collects and analyzes data on applicant qualifications, candidate and completer performance, and organization operations to evaluate and improve the performance of candidates, the organization, and its programs.*	
Description	**Indicator**
2a. Assessment System	The organization has: • An assessment system that reflects the overall organization's design and vision, and professional and state standards. • A system that includes comprehensive and integrated assessment and evaluation measures to monitor candidate performance and manage and improve the organization's operations. • Taken effective steps to eliminate bias in assessments and is working to establish the fairness, accuracy, and consistency of its assessment procedures and organization's operations. • Decisions about candidate performance are based on multiple assessments at admission into programs, appropriate transition points, and program completion.
2b. Data Collection, Analysis, and Evaluation	The organization: • Maintains an assessment system that provides regular and comprehensive information on applicant qualifications, candidate proficiencies, effectiveness of completers, the organization's operations, and program quality. • Uses multiple assessments from internal and external sources, and collects data from applicants, candidates, completers, faculty, and other members of the professional community. Assessment data are regularly and systematically collected, compiled, aggregated, summarized, and analyzed to improve candidate performance, program quality, and organization's operations. • Maintains records of formal candidate complaints and documentation of their resolution. • Maintains its assessment system through the use of information technologies appropriate to the size of the program and organization/institution.
2c. Use of Data in Organizational Improvement	The organization: • Regularly and systematically uses data, including candidate and completer performance information, to evaluate the efficacy of its courses, programs, and field experiences. • Analyzes program evaluation and performance assessment data to initiate changes in programs and organization operations. • Faculty has access to candidate assessment data and/or data systems. Candidate assessment data are regularly shared with candidates and faculty to help them reflect on and improve their performance and programs.

Organizational Standard 3 Field Experiences *The organization and its school partners design, implement, and evaluate field experiences and clinical practice so that teacher candidates and other school professionals develop and demonstrate the knowledge, skills, and professional dispositions necessary to help all students learn.*	
Description	**Indicator**
3a. Collaboration between Organization and LEA/School Partners	The organization's program and its school partners: • Design, deliver, and evaluate field experiences and clinical practice to help candidates develop their knowledge, skills, and professional dispositions. • Jointly determine the specific placement of teachers and interns for other professional roles to provide appropriate learning experiences. • Share expertise to support candidates' learning in field experiences and clinical practice.
3b. Design, Implementation, and Evaluation of Field Experiences and Clinical Practice	Candidates participate in field experiences that: • Facilitate candidates' development as educators by providing opportunities for candidates to observe in schools and other agencies, tutor students, and participate in other educationally-related community events, such as interacting with families of students, attending school board meetings, and assisting teachers or other school professionals. • Analyze P–12 student learning, and reflect on their practice in the context of theories on teaching and learning. • Reflect the organization's overall design and vision and help candidates continue to develop the content, professional, and pedagogical knowledge, skills, and professional dispositions delineated in standards. • Engage in structured activities related to the roles for which they are preparing. These activities involve the analysis of data, the use of technology and current research, and the application of knowledge related to students, families and communities. • Allow candidates to participate as teachers or other professional educators, as well as learners in the school setting. • Is sufficiently extensive and intensive for candidates to develop and demonstrate proficiencies in the professional roles for which they are preparing and/or employed. Field Experience Supervisors • Use multiple measures and multiple assessments to evaluate candidate skills, knowledge, and professional dispositions in relation to professional and state standards. • Provide regular and continuing support for teachers and interns in conventional and distance learning programs through such processes as observation, conferencing, group discussion, email, and the use of other technology. • Are clear and known to all of the involved parties. • Are accomplished professionals who are prepared for their roles as mentors and supervisors. • Have schedules with the capacity to accommodate an intensive

	mentoring program.
3c. Candidates' Development and Demonstration of Knowledge, Skills, and Professional Dispositions To Help All Students Learn	Candidates: • Are assessed using multiple strategies to evaluate their performance and impact on student learning. • Have time for reflection and include feedback from peers and field experience supervisors. • Collect and analyze data on student learning, reflect on their work, and develop strategies for improving learning. • Participate in field experiences that include students with exceptionalities and students from diverse ethnic/racial, linguistic, gender, and socioeconomic groups. Field Experience Supervisors, Program and School-Based Staff: • Jointly conduct assessments of candidate performance throughout clinical practice. • Systematically examine results related to P–12 learning, using a process of continuous assessment, reflection, and action directed at supporting P–12 student learning.

Organizational Standard 4
Diversity

The organization designs, implements, and evaluates curriculum and provides experiences for candidates to acquire and demonstrate the knowledge, skills, and professional dispositions necessary to help all students learn. Assessments indicate that candidates can demonstrate and apply proficiencies related to diversity. Experiences provided for candidates include working with diverse populations, including P-12 school faculty, candidates, and students in P–12 schools.

Description	Indicator
4a. Design, Implementation, and Evaluation of Curriculum and Experiences	The organization clearly articulates proficiencies related to diversity that candidates are expected to develop. Curriculum and field experiences provide a well-grounded framework for understanding diversity, including instruction of English language learners and students with exceptionalities. Candidates: • Are aware of different learning styles and adapt instruction or services appropriately for all students, including linguistically and culturally diverse students and students with exceptionalities. • Connect lessons, instruction, or services to students' experiences and cultures. • Communicate with students and families in ways that demonstrate sensitivity to cultural and gender differences. • Incorporate multiple perspectives in the subject matter being taught or services being provided. • Develop a classroom and school climate that values diversity. • Demonstrate classroom behaviors that are consistent with the ideas of fairness and the belief that all students can learn. Proficiencies related to diversity are assessed, and the data are used to provide feedback to candidates for improving their knowledge, skills, and professional dispositions for helping students from diverse populations learn.
4b. Experiences Working with Diverse Faculty	Candidates: • Interact with faculty, both male and female, from at least two ethnic/racial groups. • Work with Faculty in professional education classes and clinical practice have knowledge and experiences related to preparing candidates to work with diverse student populations, including English language learners and students with exceptionalities. Affirmation of the value of diversity is shown through good-faith efforts to increase or maintain faculty diversity.
4c. Experiences Working with Diverse Candidates	Candidates: • Engage with other male and female candidates from different socioeconomic groups, and at least two ethnic/racial groups. • Work together on committees and education projects related to education and the content areas. Affirmation of the value of diversity is shown through good-faith efforts the organization makes to increase or maintain a pool of candidates, both male and female, from diverse socioeconomic and ethnic/racial groups.

Organizational Standard 5 Faculty Qualifications, Performance and Development *Faculty are qualified and model best professional practices, including the assessment of their own effectiveness as related to candidate performance; they also collaborate with colleagues. The program systematically evaluates faculty performance and facilitates professional development.*	
Description	**Indicator**
5a. Qualified Faculty	Professional education faculty have expertise that qualifies them for their assignments. Faculty have: • Previous experience with similar educator preparation program instruction and professional development. • Appropriate educational background, relevant licenses or certifications. • Professional teaching experience in a variety of settings. • Professional teaching experience in the setting and content area directly relevant to the subject area for which candidates are being prepared. • Other professional experiences that promote and reward qualities necessary for educators: working successfully with people of wide ranging skills and backgrounds; being well-prepared but also able to improvise and respond; and collaborating with others.
5b. Modeling Best Professional Practices in Teaching	Professional education faculty have a thorough understanding of the content they teach. Teaching by professional education faculty includes: • Helping candidates develop the proficiencies outlined in the state standards. • Guiding candidates in the application of research, theories, and current developments in their fields and in teaching. • Encouraging candidates' development of reflection, critical thinking, problem solving, and professional dispositions. Professional education faculty: • Value candidates' learning and assess candidate performance. • Use a variety of instructional strategies that reflect an understanding of different learning styles. • Integrate diversity and technology throughout their teaching. • Assess their own effectiveness as teachers, including the positive effects they have on candidates' learning and performance.
5c. Modeling Best Professional Practices in Service	Most professional education faculty: • Provide service to the broader community in ways that are consistent with the organization's mission. • Collaborate with the professional world of practice in P–12 schools and with colleagues to improve teaching, candidate learning, and the preparation of educators. • Are actively involved in professional associations or provide community or education-related services.

5d. Organization Evaluation of Professional Education Faculty Performance	The organization conducts: • Systematic and comprehensive evaluations of faculty teaching performance to enhance the competence and intellectual vitality of the professional education faculty. • Evaluations of professional education faculty are used to improve the faculty's teaching, scholarship and service.
5f. Organization Facilitation of Professional Development	Based upon needs identified in faculty evaluations, the organization provides opportunities for faculty to develop new knowledge and skills, especially as they relate to emerging practices.

Organizational Standard 6 Organizational Governance and Resources *The organization has the leadership, authority, budget, personnel, facilities, and resources, including information technology resources, for the preparation of candidates to meet professional and state standards.*	
Description	**Indicator**
6a. Leadership and Authority	The organization: • Adequately plans, delivers, and operates coherent programs of study. • Effectively manages or coordinates all programs so that candidates are prepared to meet standards. Incorporates multiple perspectives in the subject matter being taught or services being provided. • Produces academic calendars, catalogs, publications, grading policies, and advertising are accurate and current.
6b. Budget	The organization('s): • Budget supports pre-service work essential for preparation of professional educators. • Projected budgets are reasonable, consistent with similar programs, and apply realistic projections for sources and uses of funds. • Budgetary and fiscal operations are consistent with accounting practices. • Has a track record of solid financial performance.
6c. Personnel	The organization('s): • Workload policies allow faculty members to be effectively engaged in teaching, assessment, collaborative work in P–12 schools, and service. • Employees work together on committees and education projects related to education and the content areas. • Provides an adequate number of support personnel so that programs can prepare candidates to meet standards. • Provides adequate resources and opportunities for professional development of faculty.
6d. Facilities	The organization: • Has adequate campus and school facilities to support candidates in meeting standards.
6e. Resources including Technology	The organization('s): • Allocates resources across programs (where applicable) to prepare candidates to meet standards for their fields. • Has adequate information technology resources to support faculty and candidates. • Professional educational faculty and candidates have access both to sufficient and current library and curricular resources and electronic information, including resources available within surrounding community and through partners.

II. Subject Area Program Standards

In addition to meeting the Organizational Standards outlined in Section I, institutions and organizations seeking State-Only Approval for Organizational Accreditation to prepare and recommend candidates for licensure as teachers and administrators shall be required to demonstrate how they will meet the program standards that correspond to each program discipline for which they are seeking approval.

Art

Institutions and organizations seeking State Approval for programs that prepare and result in the recommendation of candidates for licensure as Art teachers shall be required to demonstrate that they meet the following program standards. The standards below are an adapted version of the 2007 standards of the National Association of Schools of Art and Design (NASAD) for the preparation of Art teachers.

Standard 1: Personal Qualities

Indicators

Desirable characteristics of the prospective art/design teacher are:

- The potential to inspire others and to excite the imagination of students, engendering a respect and desire for art and visual experiences;
- The ability and desire constantly to seek out, evaluate, and apply new ideas and developments in both art and education;
- The ability to maintain positive relationships with individuals of various social and ethnic groups, and empathize with students and colleagues of differing backgrounds;
- The ability to articulate and communicate the goals of an art program to pupils, colleagues, administrators, and parents in an effective and professionally responsible manner.

Standard 2: Art Competencies

Indicators

The following basic competencies are essential to all prospective art teachers:

a. Studio Art

The prospective art teacher must be able to demonstrate familiarity with the basic expressive, technical, procedural and organizational skills, and conceptual insights which can be developed through studio art and design experiences. Instruction should include traditional processes as well as newer technological developments in environmental and functional design fields. Prospective art teachers must be able to make students emphatically aware of the all-important process of artistic creation from conceptualized image to finished art work.

b. Art History and Analysis

The prospective art teacher must have an understanding of:

- the major styles and periods of art history, analytical methods, and theories of criticism;
- the development of past and contemporary art forms;
- contending philosophies of art;
- the fundamental and integral relationships of all these to the making of art.

c. Advanced Work

The student in a Bachelor of Arts program should have an opportunity for advanced work in at least one or more studio and/or art application areas.

d. Technical Processes

The prospective art teacher should have functional knowledge in such areas as the physics of light, chemistry of pigments, the chemical and thermal aspects of shaping materials, and the basic technologies involved in printmaking, photography, filmmaking, and video.

Standard 3. Teaching Competencies

Indicators

The artist-teacher must be able to connect an understanding of educational processes and structures with an understanding of relationships among the arts, sciences, and humanities, in order to apply art competencies in teaching situations and to integrate art/design instruction into the total process of education. Specific competencies include:

- An understanding of child development and the identification and understanding of psychological principles of learning as they relate to art education.
- An understanding of the philosophical and social foundation underlying art in education and the ability to express a rationale for personal attitudes and beliefs.
- Ability to assess aptitudes, experiential backgrounds, and interests of individuals and groups of students and to devise learning experiences to meet assessed needs.
- Knowledge of current methods and materials available in all fields and levels of art education.
- Basic understanding of the principles and methods of developing curricula and the short and long-term instructional units that comprise them.
- The ability to accept, amend, or reject methods and materials based on personal assessment of specific teaching situations.
- An understanding of evaluative techniques and the ability to apply them in assessing both the progress of students and the objectives and procedures of the curriculum.
- Ability to organize continuing study and to incorporate knowledge gained into self-evaluation and professional growth.

4. Professional Procedures

Indicators

Programs in Art Education should be designed with the following components:

- Art education methods courses should be taught by faculty who have had successful experience teaching art in elementary and secondary schools and who maintain close contact with such schools.
- Institutions should encourage observation and discussion of teaching prior to beginning formal study in teacher education, whether at the freshman or at the more advanced level.
- Supervised practice teaching opportunities should be provided in actual school situations. These activities, as well as continuing laboratory experience, must be supervised by qualified art education personnel from the institution and the cooperating schools. The prospective art teacher for certification for kindergarten through high school (K–12) ideally should have a period of internship at both elementary and secondary levels and should be given substantial responsibility for the full range of teaching and classroom management in these experiences. The choice of sites must enable students to develop competencies consistent with the standards outlined above, and must be approved by qualified art personnel from the degree-granting institution.
- Institutions should encourage ongoing professional studio involvement for art teachers.
- Institutions should establish specific evaluative procedures to assess student progress and achievement.
- The program of evaluation should include an initial assessment of student potential for admission to the program, periodic assessment to determine progress throughout the program, and further contact after graduation. It is recommended that a college supervisor be enabled to make at least two visits each month during the internship to conduct individual conferences with the student teacher and confer with cooperating school personnel.

Biology

Institutions and Organizations seeking State Approval for programs that prepare and result in the recommendation of candidates for licensure as Biology teachers shall be required to demonstrate that they meet the following program standards. The standards below are an adapted version of the 2003 standards of the National Science Teachers Association (NSTA) for the preparation of Science Teachers.

Standard 1: Content Knowledge

Teachers of science understand and can articulate the knowledge and practices of contemporary science. They can interrelate and interpret important concepts, ideas, and applications in their fields of licensure; and can conduct scientific investigations.

Elements

To show they are prepared to teach content, teachers of science must demonstrate that they:

a. Understand and can successfully convey to students the major concepts, principles, theories, laws, and interrelationships of their fields of licensure and supporting fields as recommended by the National Science Teachers Association.
b. Understand and can successfully convey to students the unifying concepts of science delineated by the National Science Education Standards.
c. Understand and can successfully convey to students important personal and technological applications of science in their fields of licensure.
d. Understand research and can successfully design, conduct, report and evaluate investigations in science.
e. Understand and can successfully use mathematics to process and report data, and solve problems, in their field(s) of licensure.

Indicators

All secondary teachers should also be prepared to lead students to understand the <u>unifying concepts of science</u> including:

- Multiple ways we organize our perceptions of the world and how systems organize the studies and knowledge of science.
- Nature of scientific evidence and the use of models for explanation.
- Measurement as a way of knowing and organizing observations of constancy and change.
- Evolution of natural systems and factors that result in evolution or equilibrium.
- Interrelationships of form, function, and behaviors in living and nonliving systems.

All teachers of biology should be prepared to lead students to understand the unifying concepts required of all teachers of science, and should in addition be prepared to lead students to understand:

- Life processes in living systems including organization of matter and energy.
- Similarities and differences among animals, plants, fungi, microorganisms, and viruses.
- Principles and practices of biological classification.
- Scientific theory and principles of biological evolution.
- Ecological systems including the interrelationships and dependencies of organisms with each other and their environments.
- Population dynamics and the impact of population on its environment.
- General concepts of genetics and heredity.
- Organization and functions of cells and multi-cellular systems.
- Behavior of organisms and their relationships to social systems.
- Regulation of biological systems including homeostatic mechanisms.
- Fundamental processes of modeling and investigating in the biological sciences.

- Applications of biology in environmental quality and in personal and community health.

In addition to these core competencies, teachers of biology as a primary field should be prepared to effectively lead students to understand:

- Bioenergetics including major biochemical pathways.
- Biochemical interactions of organisms with their environments.
- Molecular genetics and heredity and mechanisms of genetic modification.
- Molecular basis for evolutionary theory and classification.
- Causes, characteristics and avoidance of viral, bacterial, and parasitic diseases.
- Issues related to living systems such as genetic modification, uses of biotechnology, cloning, and pollution from farming.
- Historical development and perspectives in biology including contributions of significant figures and underrepresented groups, and the evolution of theories in biology.
- How to design, conduct, and report research in biology.
- Applications of biology and biotechnology in society, business, industry, and health fields.

All teachers of biology should also be prepared to effectively apply concepts from other sciences and mathematics to the teaching of biology including basic concepts of:

- Chemistry, including general chemistry and biochemistry with basic laboratory techniques.
- Physics including light, sound, optics, electricity, energy and order, magnetism, and thermodynamics.
- Earth and space sciences including energy and geochemical cycles, climate, oceans, weather, natural resources, and changes in the Earth.
- Mathematics, including probability and statistics.

Standard 2: Nature of Science

Teachers of science engage students effectively in studies of the history, philosophy, and practice of science. They enable students to distinguish science from non-science, understand the evolution and practice of science as a human endeavor, and critically analyze assertions made in the name of science.

Elements

To show they are prepared to teach the nature of science, teachers of science must demonstrate that they:

a. Understand the historical and cultural development of science and the evolution of knowledge in their discipline.
b. Understand the philosophical tenets, assumptions, goals, and values that distinguish science from technology and from other ways of knowing the world.
c. Engage students successfully in studies of the nature of science including, when possible, the critical analysis of false or doubtful assertions made in the name of science.

Indicators

All students of science, whether teacher candidates or not, should have knowledge of the nature of science as defined in this standard, and should have the skills needed to engage students in the critical analysis of scientific and pseudoscientific claims in an appropriate way. This requires explicit attention to the nature of science, as defined in this standard, as a part of the preparation of science teachers.

Candidates should:

- Have multiple opportunities to study and analyze literature related to the history and nature of science, such as The Demon Haunted World (Sagan, 1996); Great Feuds in Science (Hellman, 1998) Facts, Fraud and Fantasy (Goran, 1979) and The Structure of Scientific Revolutions (Kuhn, 1962).
- Be required to analyze, discuss and debate topics and reports in the media related to the nature of science and scientific knowledge in courses and seminars throughout the program, not just in an educational context.
- Engage in active investigation and analysis of the conventions of science as reflected in papers and reports in science, across fields, in order to understand similarities and differences in methods and interpretations in

science, and to identify strengths and weaknesses of findings.

- Demonstrate that they are effective by successfully engaging students in the study of the nature of science. Assessments with regard to understanding may include such possibilities as completion of independent study courses, seminars or assignments; projects; papers; summative readings; or case study analyses. Assessments of effectiveness must include at least some demonstrably positive student outcomes in studies related to the nature of science as delineated by the standards in this cluster.

Standard 3: Inquiry

Teachers of science engage students both in studies of various methods of scientific inquiry and in active learning through scientific inquiry. They encourage students, individually and collaboratively, to observe, ask questions, design inquiries, and collect and interpret data in order to develop concepts and relationships from empirical experiences.

Elements

To show that they are prepared to teach through inquiry, teachers of science must demonstrate that they:

a. Understand the processes, tenets, and assumptions of multiple methods of inquiry leading to scientific knowledge.

b. Engage students successfully in developmentally appropriate inquiries that require them to develop concepts and relationships from their observations, data, and inferences in a scientific manner.

Indicators

- Candidates in a science teacher preparation program should be provided with multiple opportunities to solve open-ended problems using appropriate scientific methods. These opportunities should be present in their science content courses, but also should be fundamental in their science methods preparation. Many candidates enter teaching because they want to impart knowledge; it is not easy for them to lead students by listening and questioning, and to allow students to infer proposed solutions to problems. Practice is essential.
- The preparation of teachers for the elementary level, especially generalists, should require inquiry-based university science courses. Stalheim-Smith and Scharmann (1996) and Stoddart, Connell, Stofflett and Peck (1993) found that the use of constructivist teaching methodologies and learning cycles, methods that are generally inquiry-based, improved the learning of science by candidates in elementary education. Such courses also may increase the confidence level of generalists, who are often not confident in their ability to do science.
- Secondary programs should also strongly emphasize inquiry and pay close attention to preparing teachers to effectively lead students in such activities. All programs should provide explicit instruction in the nature of inquiry as well as its applications. Like the nature of science, inquiry is not learned well simply through practice. In general, the term “scientific method” (for the hypothetico-deductive method) should be avoided, since it may lead students to believe there is only one way to conduct scientific inquiries. Inductive studies have played a valuable role in science, as have mathematical and computer modeling. Hypotheses are not used formally by scientists in all research, nor are experiments per se the substance of all research. Candidates should study cases in which different approaches to inquiry are used in science, and should endeavor to communicate such differences to their students.
- The role of the teacher is not just to engage students in inquiry in order to develop their conceptual knowledge and process skills, but also to increase their understanding of how scientific inquiries are conducted, and how decisions are made in science. In this regard, the inquiry standards overlap and support the nature of science standards.
- Inquiry demands skill in the analysis of data and assessment of results to reach reasonable and valid conclusions. Candidates must be able to demonstrate not only that they know and understand common and different modes of scientific inquiry, but also that they can and do effectively engage students in inquiries. They should be able to demonstrate their effectiveness through student data profiles or similar means that they are effective in conducting such activities.

Standard 4: Issues

Teachers of science recognize that informed citizens must be prepared to make decisions and take action on contemporary science- and technology-related issues of interest to the general society. They require students to conduct inquiries into the factual basis of such issues and to assess possible actions and outcomes based upon their goals and values.

Elements

To show that they are prepared to engage students in studies of issues related to science, teachers of science must demonstrate that they:

a. Understand socially important issues related to science and technology in their field of licensure, as well as processes used to analyze and make decisions on such issues.
b. Engage students successfully in the analysis of problems, including considerations of risks, costs, and benefits of alternative solutions; relating these to the knowledge, goals and values of the students.

Indicators

- Science teacher preparation programs should give explicit attention to the study of socially important issues related to science and technology such as species preservation, land use, chemical pollution, weapons development, and cloning, to name but a few. Such issues may be introduced in science courses, but seldom do science courses provide for structured cost-benefit analyses or decision-making on these issues that considers all perspectives. Programs must ensure that candidates are prepared to lead students in learning how to dissect and analyze issues using data and information as resources.
- The question of how to consider an issue is just as important as the issues considered. To that end, candidates will themselves need to learn how to explore issues with an open mind. Once this is accomplished, they will need to learn how to lead students to explore these issues with the goal of making an informed and justified decision.
- To meet this standard, candidates must demonstrate that they are aware of important issues and are knowledgeable of approaches to analyzing these issues. Candidates should access common sources of information (newspapers, magazines, televised reports) to relate their science instruction to contemporary issues and events. They must then demonstrate through student achievement that they are able to effectively lead them in the study of an important issue.

Standard 5: General Skills of Teaching

Teachers of science create a community of diverse learners who construct meaning from their science experiences and possess a disposition for further exploration and learning. They use, and can justify, a variety of classroom arrangements, groupings, actions, strategies, and methodologies.

Elements

To show that they are prepared to create a community of diverse learners, teachers of science must demonstrate that they:

a. Vary their teaching actions, strategies, and methods to promote the development of multiple student skills and levels of understanding.
b. Successfully promote the learning of science by students with different abilities, needs, interests, and backgrounds.
c. Successfully organize and engage students in collaborative learning using different student group learning strategies.
d. Successfully use technological tools, including but not limited to computer technology, to access resources, collect and process data, and facilitate the learning of science.
e. Understand and build effectively upon the prior beliefs, knowledge, experiences, and interests of students.
f. Create and maintain a psychologically and socially safe and supportive learning environment.

Indicators

- The standards under the general teaching cluster are largely skills based and must be demonstrated by data from the classroom. Not all of the standards require demonstrations of student achievement or performance, but where effectiveness must be demonstrated, data from students should be used.
- Programs should provide candidates with ample opportunities to work with students using well-defined indicators of effective pedagogy. Candidates must go beyond demonstrating that they can create varied plans for instruction (as in a methods course) and actually implement a unit that has appropriate variety.
- Not all schools have diversity in terms of racial or ethnic makeup, but almost all have variations in socio-economic status, gender and learning styles. Candidates should be able to show how they have considered such differences in their planning and teaching. These considerations may be directed at a group or at individuals. For example, demonstrating the ability to make appropriate provisions for a student who does not speak English well, or who has a defined disability might be acceptable evidence of adapting instruction.
- The ability to use structured collaborative learning effectively is an important part of Standard 15. This includes, but goes beyond, setting up effective lab groups. Strategies such as Teams-Games-Tournament (TGT) and Student Teams, Achievement Division (STAD) are examples of alternative ways to organize instruction, where students teach each other (Slavin, 1996).
- Technology use is the emphasis of standard 16, as opposed to teaching about technology in contrast with science. The availability of technology in schools may limit the ability of some candidates to demonstrate their performance with students. If a teacher preparation program is situated in an area where computer technology is not common in the schools, it may be necessary to purchase laptops and lab ware for use in the schools.
- Pretesting and preconceptions surveys are excellent ways for candidates to determine the prior conceptual knowledge of their students. Candidates should also be able to show how they used prior conceptions and variations in the knowledge of their students to plan instruction in relation to the target concept.
- The cooperating teacher, using a rubric designed by the program, may assess classroom atmosphere. The candidate may also collect student feedback using an instrument of his or her own design.

Standard 6: Curriculum

Teachers of science plan and implement an active, coherent, and effective curriculum that is consistent with the goals and recommendations of the National Science Education Standards. They begin with the end in mind and effectively incorporate contemporary practices and resources into their planning and teaching.

Elements

To show that they are prepared to plan and implement an effective science curriculum, teachers of science must demonstrate that they:

a. Understand the curricular recommendations of the National Science Education Standards, and can identify, access, and/or create resources and activities for science education that are consistent with the standards.
b. Plan and implement internally consistent units of study that address the diverse goals of the National Science Education Standards and the needs and abilities of students.

Indicators

- Teacher candidates should engage in planning and implementing lessons and units of instruction early and often, and should be held responsible for demonstrating such planning throughout the program. With little experience in teaching, candidates may find such planning difficult and time-consuming. There is a tendency among novices to fall back upon activities for their own sake, rather than to deliberately plan a lesson or a unit with concern for how it might be made more effective. Practice in implementing units that have been designed to portray the National Science Education Standards and that have been field-tested may offer an opportunity to practice inquiry based teaching in a supportive context with a high probability of success.
- Resource units or collections of related materials are one way candidates can be shown to be familiar with a wide variety of materials in relation to a particular topic. Lesson plans and unit plans are generally required in most programs and can be used as data to verify that the program addresses the standards.

- Candidates can be asked to formally assess the internal consistency of their plans using program criteria and may create a reflective narrative to explain that assessment. This assessment may then be returned as part of a portfolio or as an independent assessment and may be used by the program to verify candidate skills in relation to Standard 20.

Standards 7: Science in the Community

Teachers of science relate their discipline to their local and regional communities, involving stakeholders and using the individual, institutional, and natural resources of the community in their teaching. They actively engage students in science-related studies or activities related to locally important issues.

Elements

To show that they are prepared to relate science to the community, teachers of science must demonstrate that they:

a. Identify ways to relate science to the community, involve stakeholders, and use community resources to promote the learning of science.
b. Involve students successfully in activities that relate science to resources and stakeholders in the community or to the resolution of issues important to the community.

Indicators

- To meet this standard, candidates must know the community in which they teach. Programs should provide candidates with the background and tools they need to learn about the community. This could include a community survey or visits to a community website that provides demographic and resource information about the community. Candidates should also know how to obtain information from their students that might help them to understand their needs, and might lead to guest speakers from the students' families.
- A good resource for finding out about the community is the local newspaper. News media may report on issues relevant to science and technology, which then may be used as the focus of discussion and cost-benefit analysis. It may be desirable for candidates to create and maintain a resource list for topics in their field and arrange to either take students to the field or have guest speakers come in. The Internet can also be a useful tool for finding resources in some communities.
- It is not always necessary for candidates to arrange for guest speakers or a field trip in order to make use of community resources. Students, alone or in small study groups, may be asked to investigate questions, collect data, visit sites¸ attend presentations, or interview people after school or on weekends.

Standards 8: Assessment

Teachers of science construct and use effective assessment strategies to determine the backgrounds and achievements of learners and facilitate their intellectual, social, and personal development. They assess students fairly and equitably, and require that students engage in ongoing self-assessment.

Elements

To show that they are prepared to use assessment effectively, teachers of science must demonstrate that they:

a. Use multiple assessment tools and strategies to achieve important goals for instruction that are aligned with methods of instruction and the needs of students.
b. Use the results of multiple assessments to guide and modify instruction, the classroom environment, or the assessment process.
c. Use the results of assessments as vehicles for students to analyze their own learning, engaging students in reflective self-analysis of their own work.

Indicators

- An important tenet of education is that the mode of assessment often drives methods of instruction rather than the other way around. The very nature of a performance based teacher preparation program requires candidates to pay far more attention to determining the results of instruction than has been necessary in the past.
- Multiple assessment tools should be aligned with the multiple purposes of instruction. Candidates should be called upon to justify their selection of assessment tools in relation to the purposes of the instruction. For

example, it is clearly inconsistent to use a multiple-choice quiz to assess the result of an open inquiry. Variety of assessments does not just include different kinds of traditional and nontraditional assessments, but also assessments to measure different dimensions of learning—cognitive, affective and psychomotor knowledge and skills—and dispositions of students.

- It would be expected that candidates should show at least some disposition to use assessments to guide and change instruction. These assessments may be formal or informal, formative or summative. A supervisor may note this occurring and assistant the candidate in reflecting upon this change. Alternatively, candidates may use pretests or may collect data formatively to determine whether further instruction on a concept or in a skill is needed. Some teachers have found it effective to asks students at the end of each class period to write something they have learned that day; they have then used the student response to guide their work the next day and clear up misconceptions or misunderstandings.
- It is also important that teachers be able to involve students in self-analysis. Too often assessment is something done to students. It takes little effort for candidates to include items that require student reflection on tests, projects, or activities they have completed. Conferencing with students using data from their assessments may also be a way of involving students in self assessment as long as the students themselves are doing the assessing: such conferences would not meet standard 25 if it is just another form of teacher assessment.

Standard 9: Safety and Welfare

Teachers of science organize safe and effective learning environments that promote the success of students and the welfare of all living things. They require and promote knowledge and respect for safety, and oversee the welfare of all living things used in the classroom or found in the field.

Elements

To show that they are prepared, teachers of science must demonstrate that they:

a. Understand the legal and ethical responsibilities of science teachers for the welfare of their students, the proper treatment of animals, and the maintenance and disposal of materials.
b. Know and practice safe and proper techniques for the preparation, storage, dispensing, supervision, and disposal of all materials used in science instruction.
c. Know and follow emergency procedures, maintain safety equipment, and ensure safety procedures appropriate for the activities and the abilities of students.
d. Treat all living organisms used in the classroom or found in the field in a safe, humane, and ethical manner and respect legal restrictions on their collection, keeping, and use.

Indicators

- Teacher preparation programs must ensure that candidates possess the knowledge needed to maintain a safe environment for all students. This includes knowledge of how to avoid or control hazardous materials or organisms, how to prepare and/or store materials properly, and how to clean up spills and dispose of chemicals safely.
- Candidates must know how to check and use safety equipment properly and the hazards of improperly shielded equipment, and must be able to avoid risks from fire hazards and biological contaminants.
- It is also important that candidates actually behave in a safe manner, model ethical and safe behavior, and ensure that students behave safely at all times. They must give proper safety instruction and causations, and must label materials and equipment in such a way as to maintain safety.
- In addition to safety concerns, candidates who may keep or use animals in the classroom or field should be knowledgeable of their care. They should know and comply with laws and professional standards for classroom treatment of animals and should be aware of regulations controlling the use of sentient, usually vertebrate, animals. They should be able to properly maintain the environment of the animals and dispose of wastes, respond to the illness of the animals and ensure that they have the food, water, space, shelter and care needed for their well-being.
- Where candidates may use viruses, microorganisms, or other living things potentially harmful to students, candidates should know how to clean up the classroom and dispose of materials in order to maintain safety for students and anyone who may encounter such materials. Chemical hazards or biohazards must be dealt with

according to rules and regulations that apply to all laboratories.

- Candidates should know and respect restrictions on collecting and using plants and animals, or parts of plants and animals, from the wild. They should be aware of the potential hazards of common plants as well as animals.
- Finally, they should know the common emergency precautions, responses, and reporting procedures that they are to follow in the event problems arise.
- Both knowledge and behaviors are essential components in demonstrating that this standard is met. Safety readings, tests, artifacts, projects, classroom safety evaluations, and so forth may be used to demonstrate knowledge and attention to safety matters. Reviews of regulations related to the collection and use of living things and general guidelines for safety and use of living things may also contribute to evidence of preparation. Actual performance in the classroom might be demonstrated by completion of a safety and ethical behaviors rubric or checklist by cooperating teachers.

Standard 10: Professional Growth

Teachers of science strive continuously to grow and change, personally and professionally, to meet the diverse needs of their students, school, community, and profession. They have a desire and disposition for growth and betterment.

Elements

To show their disposition for growth, teachers of science must demonstrate that they:

a. Engage actively and continuously in opportunities for professional learning and leadership that reach beyond minimum job requirements.
b. Reflect constantly upon their teaching and identify ways and means through which they may grow professionally.
c. Use information from students, supervisors, colleagues and others to improve their teaching and facilitate their professional growth.
d. Interact effectively with colleagues, parents, and students; mentor new colleagues; and foster positive relationships with the community.

Indicators

- Programs must help candidates the professional community as science educators.
- Science teaching is a composite profession requiring knowledge and skills in both science and education. Ideally, these skills come together in the preparation program.
- Associations and activities related to science teaching are abundant. Participation in such activities at the local, state and national levels should be encouraged, some being required.
- They are a resource for improving one's teaching, but also they provide the opportunity for constructive interaction with others in the same field.
- Teacher preparation programs should keep records of such activity so that they may then try to increase the activity of their candidates year by year.
- The best teachers tend to be goal-focused, but flexible and reflective. These characteristics allow them to relate to students and to modify and improve their practices.
- Candidates in teacher preparation programs must demonstrate the ability to reflect, but also to respond positively to constructive feedback from others. Few teacher educators are unfamiliar with candidates who enter their programs with preset ideas that they refuse to change, even when students do not respond well to them. It is imperative that such individuals not be allowed to continue on into teaching.
- The ability to get along with others is crucial in education, certainly with students, but also with other stakeholders such as teachers, administrators, support staff and parents.
- Dispositional factors can be assessed through the behaviors of candidates; candidates should be held accountable for behaviors that are contrary to the expectations of the profession as determined by the faculty and reflected in these standards.
- Carefully constructed criteria are needed and may be used as a source of data for candidate preparation and practice by the program.

Computer Science

Institutions and Organizations seeking State Approval for programs that prepare and result in the recommendation of candidates for licensure as Educational Computing and Technology Teachers shall be required to demonstrate that they meet the following program standards. The standards below are an adapted version of the 2001 standards of the International Society for Technology in Education (ISTE) and the National Educational Technology Standards (NETS) for Teachers for the preparation of Educational Computing and Technology Teachers.

Standard I. Programming and Algorithm Design CS endorsement candidates will demonstrate proficiency in programming that requires the use of data abstraction to solve non-trivial programming problems in multiple programming paradigms.	
Elements	**Indicators**
1.1 Laboratory-based Programming Experiences Computer Science (CS) endorsement candidates will perform laboratory-based activities that demonstrate programming proficiency in a modern high-level programming language. A sequence of experiences is recommended to provide a connected, orderly approach to computer science during the initial study of the discipline.	Candidates and their students will: • Demonstrate knowledge of and skill regarding the syntax and semantics of a high level programming language, its control structures, and its basic data representations. • Demonstrate knowledge of and skill regarding common data abstraction mechanisms (e.g., data types or classes such as stacks, trees, etc.). • Demonstrate knowledge of and skill regarding program correctness issues and practices (e.g., testing program results, test data design, loop invariants). • Design, implement, and test programs of sufficient complexity to demonstrate knowledge and skills.
1.2 Multiple Paradigms CS endorsement candidates will demonstrate an understanding of and flexibility with differing approaches/paradigms in programming (e.g., imperative, functional, object-oriented).	Candidates and their students will: • Design, implement, and test programs in languages from two different programming paradigms in a manner appropriate to each paradigm.
Standard 2. Computer Systems--Components, Organization, and Operation	
Description	**Indicators**
CS endorsement candidates will demonstrate in-depth knowledge of how computer systems work individually and collectively.	The candidates and their students will: • Effectively use a variety of computing environments (e.g., single- and multi-user systems and various operating systems). • Describe the operation of a computer system-CPU & instruction cycle, peripherals, operating system, network components, and applications-indicating their purposes and interactions among them.

Standard 3. Data Representation and Information Organization	
Description	**Indicators**
CS endorsement candidates will demonstrate an understanding of data and information representation and organization at a variety of levels--machine level representation(for program correctness); data structures (for program implementation); problem representation (for solution design); files and databases (for general applications); and interactions among systems and people (for overall system design and effectiveness).	Candidates and their students will: • Describe how data is represented at the machine level (e.g., character, boolean, integer, floating point). • Identify and provide usage examples of the various data structures and files provided by a programming language (e.g., objects, various collections, files). • Describe the elements (people, hardware, software, etc.) and their interactions within information systems (database systems, the Web, etc.).
Standard 4. Social Aspects of Computing We live within a cultural environment and interact daily with other people. Computing specialists need to communicate and work with each other and with non-specialists. Specialists and non-specialists need to be cognizant of issues and risks related to computing in our society and to learn independently as new developments in technology arise. CS endorsement candidates will demonstrate skills and understanding relative to social aspects of computing that are appropriate for specialists and non-specialists.	
Elements	**Indicators**
4.1 - Societal Impact and Issues In order to prepare high school graduates to make informed decisions regarding computing in their personal lives and with respect to societal laws and norms, CS endorsement candidates will demonstrate an understanding of computing and potential issues and skill at recognizing, researching, and analyzing issues to reach defensible conclusions. They will promote understandings relative to social aspects of computing among their secondary students.	Candidates and their students will: • Demonstrate awareness of social issues related to the use of computers in society and principles for making informed decisions regarding them (e.g., security, privacy, intellectual property, equitable access to technology resources, gender issues, cultural diversity, differences in learner needs, limits of computing, rapid change). • Analyze various social issues involving computing, producing defensible conclusions. • Demonstrate an understanding of significant historical events relative to computing.
4.2 - Independent Learning and Communication CS endorsement candidates will demonstrate the ability to help their students learn independently about computing and communicate what has been learned to others.	Candidates will: • Conduct independent learning on specific, unfamiliar topics in general areas central to computer science and provide their students with opportunities to do the same. • Produce and present reports of substantial independent learning and provide their students with opportunities to do the same.
4.3 - Collaborative Software Development CS endorsement candidates will demonstrate knowledge and experience in collaborative software development and provide opportunities for their students to do the same.	Candidates will: • Participate in team software development projects that apply sound software engineering principles.

Standard 5. Planning Instruction	
Description	**Indicators**
CS endorsement candidates will demonstrate an understanding of the teaching tasks and approaches and be able to apply and evaluate them with respect to the students in computer science classes. Evidence of these capabilities should include examples of student performance resulting from this planning.	Candidates will: • Identify resources, strategies, activities, and manipulatives appropriate to teaching secondary computer science. • Plan lessons/modules/courses related to each of programming process, knowledge/concepts, and issue examination. • Develop assessment strategies appropriate to lesson goals and the need to provide student feedback • Perform course and lesson planning that addresses student population characteristics (e.g., academic ability, cultural experience, gender).
Standard 6. Classroom and Field Experiences in Computer Science--Delivering Instruction	
Description	Indicators
CS endorsement candidates will observe and participate in instructional planning and delivery in secondary computer science classrooms. Evidence should include some examples of effects on student performance.	Candidates will: • Observe and discuss the teaching of secondary computer science • Participate in the teaching of secondary computer science (lab assistant, tutoring, mini-teaching, etc.) • Plan and deliver a unit of instruction
Standard 7. Classroom & Course Management	
Description	Indicators
CS endorsement candidates will apply methods and skills appropriate to the management of the secondary computer science classroom. Evidence should include some examples of effects on student performance.	Candidates will: • Plan direct instruction involving simultaneous use of computing facilities by students (e.g., holding class in the lab, closed labs) • Plan instruction involving students independently using computing facilities
Standard 8. Instructional Assessment	
Description	Indicators
Reflection upon one's own performance as a teacher is essential for improving that performance. Thus, teacher candidates will examine and work to improve their teaching practice. Assessing secondary student performance is essential to determining success in teaching practice, as well.	Candidates will: • Develop a personal plan for evaluating their own practice of teaching • Make use of their plan for self-evaluation in the instructional delivery activities • Develop assessment criteria and procedures to determine successful performance and analyze results to improve instructional practice.

Standard 9. Professional Development	
Description	Indicators
CS endorsement candidates must recognize and plan for ongoing professional development that will be needed to sustain themselves and their students.	Candidates will: • Discuss guidance roles and possible enrichment activities for secondary computer science students (e.g., computing career guidance, preparation for college, gender equity, cultural diversity, and extracurricular activities such as computer clubs and organized competitions) • Plan for professional growth after identifying professional computer science and computer science education societies, organizations, groups, etc. that provide professional growth opportunities and resources

Early Childhood Education (Pre-Kindergarten – 3rd Grade)

Institutions and Organizations seeking State Approval for programs that prepare and result in the recommendation of teacher candidates for licensure in Early Childhood Education shall be required to demonstrate that they meet the following program standards. The standards below are an adapted version of the 2001 standards of the National Association for the Education of Young Children (NAEYC) for the preparation of Early Childhood Education teachers.

Standard 1. Promoting Child Development and Learning Candidates use their understanding of young children's characteristics and needs, and of multiple interacting influences on children's development and learning, to create environments that are healthy, respectful, supportive, and challenging for all children.	
Elements	**Indicators**
1a: Knowing and understanding young children's characteristics and needs	Candidates are provided with multiple, developmental opportunities to gain essential understanding of young children's characteristics and needs. As a result, candidates' work reflects current, research-based knowledge in most respects; candidates are knowledgeable about development in all areas and can give examples of interrelationships among developmental areas.
1b: Knowing and understanding the multiple influences on development and learning	Candidates are provided with multiple, developmental opportunities to gain essential understanding of the multiple influences on young children's development and learning. As a result, candidates' work shows that they can describe the nature of these influences and understand that influences may interact in complex ways. Their work demonstrates familiarity with the most well known early intervention programs, and they can cite research about the influence of these programs on child outcomes.
1c: Using developmental knowledge to create healthy, respectful, supportive, and challenging learning environments	Candidates are provided with multiple, developmental opportunities to apply child development knowledge in creating learning environments that are healthy, respectful, supportive, and challenging. As a result of these experiences, candidates' work shows that they can describe the essentials of developmental research and the principles that they are using as a basis for creating effective learning environments. There is adequate evidence that the environments created by these candidates support children's health, respect their culture and individuality, promote positive development, and challenge children to gain new competencies.

Standard 2. Building Family and Community Relationships Candidates know about, understand, and value the importance and complex characteristics of children's families and communities. They use this understanding to create respectful, reciprocal relationships that support and empower families, and to involve all families in their children's development and learning.	
Elements	**Indicators**
2a: Knowing about and understanding family and community characteristics	Candidates are provided with multiple, developmental opportunities to gain essential understanding of family and community characteristics as they affect early childhood practice. As a result, candidates' work shows general knowledge of family theory and research, and it shows that candidates can identify a variety of family and community factors as they impact young children's lives. Candidates demonstrate that they know the significant characteristics of the families and communities in which they are practicing.
2b: Supporting and empowering families and communities through respectful, reciprocal relationships	Candidates are provided with multiple, developmental opportunities to gain essential understanding and skills in using respectful, reciprocal relationships to support and empower families. As a result, candidates' work shows that they can describe how to use knowledge of families' goals, language and culture, and individual characteristics to build these relationships. Candidates apply their knowledge in using varied family communication strategies including technology; in linking families with key community resources; and in accessing information about other resources as needed.
2c: Involving families and communities in their children's development and learning	Candidates are provided with multiple, developmental opportunities to gain essential understanding and skills concerning family and community involvement. As a result, candidates' work shows that they can articulate theory and research to support the concept that families are young children's primary teachers, and that family and community involvement are critical to successful early learning. Their knowledge is shown in their varied approaches to family and community involvement, and their modification of approaches when their first attempts are not successful.
Standard 3. Observing, Documenting, and Assessing to Support Young Children and Families Candidates know about and understand the goals, benefits, and uses of assessment. They know about and use systematic observations, documentation, and other effective assessment strategies in a responsible way, in partnership with families and other professionals, to support children's development and learning.	
Elements	**Indicators**
3a: Understanding the goals, benefits, and uses of assessment	Candidates are provided with multiple, developmental opportunities to gain essential understanding of the goals, benefits, and uses of assessment. As a result, candidates' work shows knowledge of the important goals of early childhood assessment. Their work generally shows alignment between goals, curriculum, teaching strategies, and

	assessments. In their work, candidates explain how assessment may be used in positive ways, and they also explain how inappropriate assessment may harm children and families.
3b: Knowing about and using observation, documentation, and other appropriate assessment tools and approaches	Candidates are provided with multiple, developmental opportunities to gain essential understanding and skills concerning appropriate assessment tools and approaches. As a result of these opportunities, candidates' work shows research-based knowledge and basic competence in observation, documentation, and other assessment tools. Their work reflects essential knowledge of the characteristics, strengths, limitations, and appropriate uses of the most frequently used assessment tools and approaches, including approaches for children with disabilities and culturally and linguistically diverse children. Candidates demonstrate essential skills in using assessments, interpreting assessment results, making referrals, and using assessment information to influence practice.
3c: Understanding and practicing responsible assessment	Candidates are provided with multiple, developmental opportunities to gain essential understanding and skills concerning the concept of responsible assessment. As a result, candidates' work shows that they can identify current educational, legal, and ethical issues with respect to assessment practices. Candidates can provide examples of responsible as well as irresponsible assessment. In their practice, they apply responsible assessment practices when working with diverse children.
3d: Knowing about assessment partnerships with families and other professionals	Candidates are provided with multiple, developmental opportunities to gain essential understanding of assessment partnerships involving families and other professionals. As a result, candidates' work articulates the research and legal base that supports these partnerships. Candidates demonstrate core skills in team building and in communication with families and other professionals around assessment issues.

Standard 4. Teaching and Learning

Candidates integrate their understanding of and relationships with children and families; their understanding of developmentally effective approaches to teaching and learning; and their knowledge of academic disciplines, to design, implement, and evaluate experiences that promote positive development and learning for all children.

Elements	Indicators
4a: Knowing, understanding, and using positive relationships and supportive interactions	Candidates are provided with multiple, developmental opportunities to gain knowledge and skill in building positive relationships and supportive interactions. As a result, candidates' work shows essential knowledge of theory and research underlying the early childhood field's focus on relationships and interactions. They know the importance of creating relationships with all children, as seen in their competent, beginning skills in relationship building with diverse children and families.

4b: Knowing, understanding, and using appropriate, effective approaches and strategies for early education	Candidates are provided with multiple, developmental opportunities to gain knowledge and skill in how to support development and learning through a wide range of approaches and strategies. As a result, candidates' work demonstrates each of the following approaches and strategies with competence and with knowledge of the underlying theory and research: fostering oral language and communication; drawing from a continuum of teaching strategies; making the most of environments and routines; capitalizing on incidental teaching; focusing on children's characteristics, needs, and interests; linking children's language and culture to the early childhood program; teaching through social interactions; creating support for play; addressing children's challenging behaviors; supporting learning through technology; and using integrative approaches to curriculum.
4c: Knowing and understanding the importance, central concepts, inquiry tools, and structures of content areas or academic disciplines	Candidates are provided with multiple, developmental opportunities to gain essential knowledge and skill in each content area: language and literacy; the arts; mathematics; physical activity and physical education; science; and social studies, with special depth in the areas of language and literacy and mathematics. As a result, candidates' work shows knowledge of the theories and research underlying the early childhood field's focus on content, both in general and with respect to each content area, including academic subjects. Taking developmental and individual differences into account, candidates' work shows that they use this knowledge to articulate priorities for high quality, meaningful experiences in each content area, with desired outcomes for children that connect with professional standards and resources. Candidates are familiar with authoritative resources to supplement their own content knowledge.
4d: Using own knowledge and other resources to design, implement, and evaluate meaningful, challenging curriculum to promote positive outcomes	Candidates are provided with multiple, developmental opportunities to gain essential skill in designing, implementing, and evaluating meaningful, challenging, curriculum. As a result, candidates' work shows ability to integrate multiple areas of knowledge in curriculum design, with successful focus on building security and self-regulation; problem-solving and thinking skills, and academic and social competence. Candidates' curriculum development takes into account children's developmental, individual, and cultural characteristics, and it makes use of reflective, ongoing evaluation. Candidates' curriculum development is characterized by use of high quality professional resources to supplement and inform their own understanding.

Standard 5. Becoming a Professional Candidates identify and conduct themselves as members of the early childhood profession. They know and use ethical guidelines and other professional standards related to early childhood practice. They are continuous, collaborative learners who demonstrate knowledgeable, reflective, and critical perspectives on their work, making informed decisions that integrate knowledge from a variety of sources. They are informed advocates for sound educational practices and policies.	
Elements	**Indicators**
5a: Identifying and involving oneself with the early childhood field	Candidates are provided with multiple, developmental opportunities to gain a beginning identification with and involvement in the early childhood field. As a result, candidates' work shows an understanding of the early childhood field as a distinctive profession and of the essentials of its history. In their work, candidates demonstrate understanding of their own emerging professional roles and the possibilities, opportunities, and challenges within the early childhood field. They show some evidence of active involvement in the profession.
5b: Knowing about and upholding ethical standards and other professional guidelines	Candidates are provided with multiple, developmental opportunities to learn about and practice upholding the field's ethical standards and other professional guidelines. As a result, candidates' work shows essential knowledge of NAEYC's Code of Ethical Conduct, as seen in citations of examples of how the Code may be used to analyze and resolve ethical dilemmas. Candidates are familiar with relevant legal standards and other professional guidelines and can apply these in practice.
5c: Engaging in continuous, collaborative learning to inform practice	Candidates are provided with multiple, developmental opportunities to become continuous, collaborative learners. As a result, candidates' work shows evidence of an orientation toward inquiry and self-motivation, combined with involvement and beginning skills in collaborative learning, including collaboration across disciplines and in inclusive settings. Candidates' work shows positive effects of this learning orientation, in their practice and in effects on children.
5d: Integrating knowledgeable, reflective, and critical perspectives on early education	Candidates are provided with multiple, developmental opportunities to construct and apply knowledgeable, reflective, and critical perspectives on their field. As a result, candidates' work shows essential understanding of the field's central issues, standards, and research findings. In their work, candidates analyze and reflect upon their practice and demonstrate critical thinking about the issues in the field and an understanding of the value of dialogue in resolving differences. Candidates' work shows positive effects of these professional perspectives, in their practice and in effects on children.
5e: Engaging in informed advocacy for children and the profession	Candidates are provided with multiple, developmental opportunities to develop early childhood advocacy skills. As a result, candidates' work shows essential knowledge of the

	central policy issues in the field, as seen in their discussions of ethical and societal issues in early education. In their work, candidates can outline how public policies are developed at the state and federal levels. Candidates possess beginning advocacy skills, including written and verbal communication and collaboration.

Educational Administration and Leadership

Institutions and Organizations seeking State Approval for programs that prepare and result in the recommendation of candidates for licensure as Principals and Assistant Principals shall be required to demonstrate that they meet the following program standards. The standards below are an adapted version of the 2001 standards of the Educational Leadership Constituent Council (ELCC) for the preparation of Principals and Superintendents.

Standard 1 - Candidates who complete the program are educational leaders who have the knowledge and ability to promote the success of all students by facilitating the development, articulation, implementation, and stewardship of a school or district vision of learning supported by the school community.	
Elements	**Indicators**
1.1 Develop a Vision	• Candidates develop a vision of learning for a school that promotes the success of all students. • Candidates base this vision on relevant knowledge and theories, including but not limited to an understanding of learning goals in a pluralistic society, the diversity of learners and learners' needs, schools as interactive social and cultural systems, and social and organizational change.
1.2 Articulate a Vision	• Candidates demonstrate the ability to articulate the components of this vision for a school and the leadership processes necessary to implement and support the vision. • Candidates demonstrate the ability to use data-based research strategies and strategic planning processes that focus on student learning to inform the development of a vision, drawing on relevant information sources such as student assessment results, student and family demographic data, and an analysis of community needs. • Candidates demonstrate the ability to communicate the vision to staff, parents, students, and community members through the use of symbols, ceremonies, stories, and other activities.
1.3 Implement a Vision	• Candidates can formulate the initiatives necessary to motivate staff, students, and families to achieve the school's vision. • Candidates develop plans and processes for implementing the vision (e.g., articulating the vision and related goals, encouraging challenging standards, facilitating collegiality and teamwork, structuring significant work, ensuring appropriate use of student assessments, providing autonomy, supporting innovation, delegating responsibility, developing leadership in others, and securing needed resources).
1.4 Steward a Vision	• Candidates demonstrate an understanding of the role effective communication skills play in building a shared commitment to the vision. • Candidates design or adopt a system for using data-based research strategies to regularly monitor, evaluate, and revise the vision. • Candidates assume stewardship of the vision through various methods.
1.5 Promote Community Involvement in the Vision	• Candidates demonstrate the ability to involve community members in the realization of the vision and in related school improvement efforts. • Candidates acquire and demonstrate the skills needed to communicate effectively with all stakeholders about implementation of the vision.

Standard 2 - Candidates who complete the program are educational leaders who have the knowledge and ability to promote the success of all students by promoting a positive school culture, providing an effective instructional program, applying best practice to student learning, and designing comprehensive professional growth plans for staff.	
Elements	**Indicators**
2.1 Promote Positive School Culture	• Candidates assess school culture using multiple methods and implement context-appropriate strategies that capitalize on the diversity (e.g., population, language, disability, gender, race, socio-economic) of the school community to improve school programs and culture.
2.2 Provide Effective Instructional Program	• Candidates demonstrate the ability to facilitate activities that apply principles of effective instruction to improve instructional practices and curricular materials. • Candidates demonstrate the ability to make recommendations regarding the design, implementation, and evaluation of a curriculum that fully accommodates learners' diverse needs. • Candidates demonstrate the ability to use and promote technology and information systems to enrich curriculum and instruction, to monitor instructional practices and provide staff the assistance needed for improvement.
2.3 Apply Best Practice to Student Learning	• Candidates demonstrate the ability to assist school personnel in understanding and applying best practices for student learning. • Candidates apply human development theory, proven learning and motivational theories, and concern for diversity to the learning process. • Candidates demonstrate an understanding of how to use appropriate research strategies to promote an environment for improved student achievement.
2.4 Design Comprehensive Professional Growth Plans	• Candidates design and demonstrate an ability to implement well-planned, context-appropriate professional development programs based on reflective practice and research on student learning consistent with the school vision and goals. • Candidates demonstrate the ability to use strategies such as observations, collaborative reflection, and adult learning strategies to form comprehensive professional growth plans with teachers and other school personnel. • Candidates develop and implement personal professional growth plans that reflect a commitment to life-long learning.
Standard 3 - Candidates who complete the program are educational leaders who have the knowledge and ability to promote the success of all students by managing the organization, operations, and resources in a way that promotes a safe, efficient, and effective learning environment.	
Elements	**Indicators**
3.1 Manage the Organization	• Candidates demonstrate the ability to optimize the learning environment for all students by applying appropriate models and principles of organizational development and management, including research and data driven decision making with attention to indicators of equity, effectiveness, and efficiency. • Candidates develop plans of action for focusing on effective organization and management of fiscal, human, and material resources, giving priority to student learning, safety, curriculum, and instruction. • Candidates demonstrate an ability to manage time effectively and deploy financial and human resources in ways that promote student achievement.

3.2 Manage Operations	• Candidates demonstrate the ability to involve staff in conducting operations and setting priorities using appropriate and effective needs assessment, research-based data, and group process skills to build consensus, communicate, and resolve conflicts in order to align resources with the organizational vision. • Candidates develop communications plans for staff that includes opportunities for staff to develop their family and community collaboration skills. • Candidates demonstrate an understanding of how to apply legal principles to promote educational equity and provide safe, effective, and efficient facilities.
3.3 Manage Resources	• Candidates use problem-solving skills and knowledge of strategic, long-range, and operational planning (including applications of technology) in the effective, legal, and equitable use of fiscal, human, and material resource allocation and alignment that focuses on teaching and learning. • Candidates creatively seek new resources to facilitate learning. • Candidates apply and assess current technologies for school management, business procedures, and scheduling.
Standard 4 - Candidates who complete the program are educational leaders who have the knowledge and ability to promote the success of all students by collaborating with families and other community members, responding to diverse community interests and needs, and mobilizing community resources.	
Elements	**Indicators**
4.1 Collaborate with Families and Other Community Members	• Candidates demonstrate an ability to bring together the resources of family members and the community to positively affect student learning. • Candidates demonstrate an ability to involve families in the education of their children based on the belief that families have the best interests of their children in mind. • Candidates demonstrate the ability to use public information and research-based knowledge of issues and trends to collaborate with families and community members. • Candidates apply an understanding of community relations models, marketing strategies and processes, data-based decision making, and communications theory to create frameworks for school, family, business, community, government, and higher education partnerships. • Candidates develop various methods of outreach aimed at business, religious, political, and service organizations. • Candidates demonstrate the ability to involve families and other stakeholders in school decision-making processes, reflecting an understanding that schools are an integral part of the larger community. • Candidates demonstrate the ability to collaborate with community agencies to integrate health, social, and other services. • Candidates develop a comprehensive program of community relations and demonstrate the ability to work with the media.

4.2 Respond to Community Interests and Needs	• Candidates demonstrate active involvement within the community, including interactions with individuals and groups with conflicting perspectives. • Candidates demonstrate the ability to use appropriate assessment strategies and research methods to understand and accommodate diverse school and community conditions and dynamics. • Candidates provide leadership to programs serving students with special and exceptional needs. • Candidates demonstrate the ability to capitalize on the diversity (cultural, ethnic, racial, economic, and special interest groups) of the school community to improve school programs and meet the diverse needs of all students.
4.3 Mobilize Community Resources	• Candidates demonstrate an understanding of and ability to use community resources, including youth services, to support student achievement, solve school problems, and achieve school goals. • Candidates demonstrate how to use school resources and social service agencies to serve the community. • Candidates demonstrate an understanding of ways to use public resources and funds appropriately and effectively to encourage communities to provide new resources to address emerging student problems.

Standard 5 - Candidates who complete the program are educational leaders who have the knowledge and ability to promote the success of all students by acting with integrity, fairly, and in an ethical manner.

Elements	Indicators
5.1 Acts with Integrity	• Candidates demonstrate a respect for the rights of others with regard to confidentiality and dignity and engage in honest interactions.
5.2 Acts Fairly	• Candidates demonstrate the ability to combine impartiality, sensitivity to student diversity, and ethical considerations in their interactions with others.
5.3 Acts Ethically	• Candidates make and explain decisions based upon ethical and legal principles.

Standard 6 - Candidates who complete the program are educational leaders who have the knowledge and ability to promote the success of all students by understanding, responding to, and influencing the larger political, social, economic, legal, and cultural context.

Elements	Indicators
6.1 Understand the Larger Context	• Candidates act as informed consumers of educational theory and concepts appropriate to school context and can demonstrate the ability to apply appropriate research methods to a school context. • Candidates demonstrate the ability to explain how the legal and political systems and institutional framework of schools have shaped a school and community, as well as the opportunities available to children and families in a particular school. • Candidates demonstrate the ability to analyze the complex causes of poverty and other disadvantages and their effects on families, communities, children, and learning. • Candidates demonstrate an understanding of the policies, laws, and regulations enacted by local, state, and federal authorities that affect schools, especially those that might improve educational and social opportunities. • Candidates demonstrate the ability to describe the economic factors shaping a local community and the effects economic factors have on local schools.

	• Candidates demonstrate the ability to analyze and describe the cultural diversity in a school community. • Candidates can describe community norms and values and how they relate to the role of the school in promoting social justice. • Candidates demonstrate the ability to explain various theories of change and conflict resolution and the appropriate application of those models to specific communities.
6.2 Respond to the Larger Context	• Candidates demonstrate the ability to communicate with members of a school community concerning trends, issues, and potential changes in the environment in which the school operates, including maintenance of an ongoing dialogue with representatives of diverse community groups.
6.3 Influence the Larger Context	• Candidates demonstrate the ability to engage students, parents, and other members of the community in advocating for adoption of improved policies and laws. • Candidates apply their understanding of the larger political, social, economic, legal, and cultural context to develop activities and policies that benefit students and their families. • Candidates advocate for policies and programs that promote equitable learning opportunities and success for all students, regardless of socioeconomic background, ethnicity, gender, disability, or other individual characteristics.
Standard 7 - The internship provides significant opportunities for candidates to synthesize and apply the knowledge and practice and develop the skills identified in Standards 1-6 through substantial, sustained, standards-based work in real settings, planned and guided cooperatively by the institution and school district personnel for graduate credit.	
Elements	**Indicators**
7.1 Substantial	• Candidates demonstrate the ability to accept genuine responsibility for leading, facilitating, and making decisions typical of those made by educational leaders. • The experience(s) should provide interns with substantial responsibilities that increase over time in amount and complexity and involve direct interaction and involvement with staff, students, parents, and community leaders. • Each candidate should have a minimum of six months (or equivalent, see note below) of fulltime internship experience.
7.2 Sustained	• Candidates participate in planned intern activities during the entire course of the program, including an extended period of time near the conclusion of the program to allow for candidate application of knowledge and skills on a full-time basis.
7.3 Standards-based	• Candidates apply skills and knowledge articulated in these standards as well as state and local standards for educational leaders. • Experiences are designed to accommodate candidates' individual needs.
7.4 Real Settings	• Candidates' experiences occur in multiple settings that allow for the demonstration of a wide range of relevant knowledge and skills. • Candidates' experiences include work with appropriate community organizations such as social service groups and local businesses.

7.5 Planned and Guided Cooperatively	• Candidates' experiences are planned cooperatively by the individual, the site supervisor, and institution personnel to provide inclusion of appropriate opportunities to apply skills, knowledge, and research contained in the standards. • The three individuals work together to meet candidate and program needs. • Mentors are provided training to guide the candidate during the intern experience.

Elementary Education

Institutions and Organizations seeking State Approval for programs that prepare and result in the recommendation of candidates for licensure as teachers of Elementary Education shall be required to demonstrate that they meet the following program standards. The standards below are an adapted version of the 2007 Standards of the Association for Childhood Education International for the preparation of Elementary School Teachers.

Standard 1 – Development, Learning and Motivation	
Description	**Indicators**
Candidates know, understand, and use the major concepts, principles, theories, and research related to development of children and young adolescents to construct learning opportunities that support individual students' development, acquisition of knowledge, and motivation.	Candidates for elementary teaching base their teaching and related professional responsibilities on a thorough understanding of developmental periods of childhood and early adolescence. In curriculum planning, instruction, and assessment of student learning, candidates: • Consider, accommodate, and integrate the physical, social, emotional, cognitive, and linguistic developmental characteristics of children and young adolescents. • Draw upon developmental knowledge to plan curriculum that is achievable but also challenging for children at various developmental levels. • Draw upon an in-depth knowledge of child and young adolescent development and learning to understand students' abilities, interests, individual aspirations, and values. • Adapt curriculum and teaching to motivate and support student learning and development. • Understand that the ways in which cultures and social groups differ are important and affect learning. • Recognize when an individual student's development differs from typical developmental patterns and collaborate with specialists to plan and implement appropriate learning experiences that address individual needs. • Know that all children can learn when developmental factors are recognized, respected, and accommodated and demonstrate that knowledge in their practice. • Consider diversity an asset and respond positively to it.

Standard 2 - Curriculum	
Description	**Indicators**
Standard 2.1 Reading, Writing, and Oral Language Candidates demonstrate a high level of competence in use of English language arts and they know, understand, and use concepts from reading, language and child development, to teach reading, writing, speaking, viewing, listening, and thinking skills and to help students successfully apply their developing skills to many different situations, materials, and ideas.	Candidates are adept at teaching the fundamentals of the English Language Arts. Candidates: • Model effective use of English, including its syntax, lexicon, history, varieties, literature, and oral and written composing processes. • Understand how elementary children develop and learn to read, write, speak, view, and listen effectively. • Use their knowledge and understanding of language, first and second language development, and the language arts to design instructional programs and strategies that build on students' experiences and existing language skills and result in their students becoming competent, effective users of language. • Teach students to read competently and encourage students' enjoyment of reading through multiple instructional strategies, technologies, and a variety of language activities. • Teach children to read with a balanced instructional program that includes an emphasis on use of letter/sound relationships (phonics), context (semantic and syntactic), and text that has meaning for students. • Teach students a variety of strategies to monitor their own reading comprehension. • Are also familiar with, able to use, and recommend to students many reading materials based on different topics, themes, and a variety of situations and consisting of different types, including stories, poems, biography, non-fiction, many categories of literature written for children, and texts from various subject areas. • Encourage elementary students' understanding of their individual responses to what they read and sharing those responses. • Help students think critically about what they read. • Provide both instruction in and opportunities for elementary students to develop effective writing and speaking skills so that they can communicate their knowledge, ideas, understanding, insights, feelings, and experiences to other students and to parents, teachers, and other adults. • Provide their students with many different writing and speaking experiences in order to teach the skills of writing and speaking. • Enable students to explore the uses of different types of writing and speaking with different audiences and in different situations. • Help students develop their capacities to listen so that they understand, consider, respond to, and discuss spoken material, including non-fiction, stories, and poems. • Know what preconceptions, error patterns, and misconceptions they may expect to find in students' understanding of how language functions in communication, and they are able to help students correct their misunderstandings of the development and uses of language. • Use formative and summative assessment to determine the level of students' competence in their understanding of and use of language. • Use the results of such assessment to plan further instruction.

2.2 Science Candidates know, understand, and use fundamental concepts of physical, life, and earth/space sciences. Candidates can design and implement age-appropriate inquiry lessons to teach science, to build student understanding for personal and social applications, and to convey the nature of science.	Candidates have a broad general understanding of science and they teach elementary students the nature of science, and the content and fundamentals of physical, life, earth and space sciences, and their interrelationships. Candidates: • Are familiar with, and teach, the major concepts and principles that unify all scientific effort and that are used in each of the science disciplines: (1) systems, order, and organization; (2) evidence, models, and explanation; (3) change, constancy, and measurement; (4) evolution and equilibrium; and (5) form and function. • Engage elementary students in the science inquiry process that involves asking questions, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, constructing and analyzing alternative explanations, and communicating scientific arguments and explanations. • Introduce students to understandings about science and technology and to distinctions between natural objects and objects made by humans by creating experiences in making models of useful things, and by developing students' abilities to identify and communicate a problem, and to design, implement, and evaluate a solution. • Know naive theories and misconceptions most children have about scientific and technological phenomena and help children build understanding. • Understand the use of assessment through diverse data-collection methods as ways to inform their teaching and to help students learn scientific inquiry, scientific understanding of the natural world, and the nature and utility of science.
2.3 Mathematics Candidates know, understand, and use the major concepts and procedures that define number and operations, algebra, geometry, measurement, and data analysis and probability. In doing so they consistently engage problem solving, reasoning and proof, communication, connections, and representation.	Candidates are able to teach elementary students to explore, conjecture, and reason logically using various methods of proof; to solve non-routine problems; to communicate about and through mathematics by writing and orally using everyday language and mathematical language, including symbols; to represent mathematical situations and relationships; and to connect ideas within mathematics and between mathematics and other intellectual activity. Candidates: • Help students understand and use measurement systems (including time, money, temperature, two and three dimensional objects using non-standard and standard customary and metric units); explore pre-numeration concepts, whole numbers, fractions, decimals, percents and their relationships; apply the four basic operations (addition, subtraction, multiplication, and division) with symbols and variables to solve problems and to model, explain, and develop computational algorithms; use geometric concepts and relationships to describe and model mathematical ideas and real-world constructs; formulate questions, and collect, organize, represent, analyze, and interpret data by use of tables, graphs, and charts. • Help elementary students identify and apply number sequences and proportional reasoning, predict outcomes and conduct experiments to test predictions in real-world situations; compute fluently; make estimations and check the reasonableness of results; select and use

	appropriate problem-solving tools, including mental arithmetic, pencil-and-paper computation, a variety of manipulative and visual materials, calculators, computers, electronic information resources, and a variety of other appropriate technologies to support the learning of mathematics. • Know and are able to help students understand the history of mathematics and contributions of diverse cultures to that history. • Know what mathematical preconceptions, misconceptions, and error patterns to look for in elementary student work as a basis to improve understanding and construct appropriate learning experiences and assessments.
2.4 Social studies Candidates know, understand, and use major concepts and modes of inquiry from the social studies—the integrated study of history, geography, the social sciences, and other related areas—to promote elementary students' abilities to make informed decisions as citizens of a culturally diverse democratic society and interdependent world.	The social studies include history, geography, the social sciences (such as anthropology, archaeology, economics, political science, psychology, and sociology) and other related areas (such as humanities, law, philosophy, religion, mathematics, science and technology). Candidates are able to: • Use knowledge, skills, and dispositions from social studies to organize and provide integrated instruction in grades K-6 for the study of major themes, concepts and modes of inquiry drawn from academic fields that address: (1) culture; (2) time, continuity, and change; (3) people, places, and environment; (4) individual development and identity; (5) individuals, groups, and institutions; (6) power, governance, and authority; (7) production, distribution, and consumption; (8) science, technology, and society; (9) global connections; and (10) civic ideals and practices. • Use their knowledge of social studies to help students learn about academic fields of knowledge, as well as major themes that integrate knowledge across academic fields. • Develop experiences to help elementary students learn about the historical development of democratic values; the basic principles of government and citizenship in a democratic republic; the past, present, and future; spatial relations; the development of nations, institutions, economic systems, culture, and cultural diversity; the influences of belief systems; and the humanities • Help students read, write, listen, discuss, speak, and research to build background knowledge; examine a variety of sources (e.g., primary and secondary sources, maps, statistical data, and electronic technology-based information); acquire and manipulate data; analyze points of view; formulate well-supported oral and written arguments, policies, and positions; construct new knowledge and apply knowledge in new settings. • Use formative and summative assessments in planning and implementing instruction.

2.5 The Arts Candidates know, understand, and use—as appropriate to their own understanding and skills—the content, functions, and achievements of the performing arts (dance, music, theater) and the visual arts as primary media for communication, inquiry, and engagement among elementary students.	Candidates understand distinctions and connections between arts study and arts experiences. Candidates: • Recognize that arts instruction must be sequential. • Encourage the kind of study and active participation that leads to competence and appreciation. • Work alone, with arts specialist teachers, and/or with other qualified arts professionals enabling students to: 1. communicate at a basic level in the four arts disciplines--dance, music, theater, and the visual arts-- including knowledge and skills in the use of basic vocabularies, materials, traditional and technology-based tools, techniques, and thinking processes of each arts discipline; 2. develop and present basic analyses of works of art from structural, historical, and cultural perspectives; 3. have an informed acquaintance with exemplary works of art from a variety of cultures and historical periods; and 4. relate basic types of arts knowledge and skills within and across the arts disciplines, and to make connections with other disciplines. • Understand that student competence at a basic level serves as the foundation for more advanced work. • Understand that there are many routes to competence, that elementary students may work in different arts at different times, that their study may take a variety of approaches, and that their abilities may develop at different rates.
2.6 Health education Candidates know, understand, and use the major concepts in the subject matter of health education to create opportunities for student development and practice of skills that contribute to good health.	Candidates understand the foundations of good health, including the structure and function of the body and its systems and the importance of physical fitness and sound nutrition. Candidates: • Help students understand the benefits of a healthy lifestyle for themselves and others as well as the dangers of diseases and activities that may contribute to disease. • Are alert to major health issues concerning children and the social forces that affect them, and of the need to impart information on these issues sensitively. • Address issues in ways that help students recognize potentially dangerous situations, clarify misconceptions, and find reliable sources of information.
2.7 Physical education Candidates know, understand, and use—as appropriate to their own understanding and skills—human movement and physical activity as central elements to foster active, healthy life styles and enhanced quality of life for elementary students.	Candidates understand physical education content relevant to the development of physically educated individuals. Candidates: • Structure learning activities to ensure that students demonstrate competence in many movement forms, and can apply movement concepts and principles to the learning and development of motor skills. • Know that physical inactivity is a major health risk factor in our society and recognize the critical importance of physically active life styles for all students. • Help students develop knowledge and skills necessary to achieve and maintain a health-enhancing level of physical fitness.

	• Appreciate the intrinsic values and benefits associated with physical activity. • Are able to structure movement experiences that foster opportunities for enjoyment, challenge, self-expression, and social interaction, and that elicit responsible personal and social behavior and respect for individual differences among people in physical activity.
Standard 3 - Instruction	
Description	**Indicators**
3.1 Integrating and applying knowledge for instruction Candidates plan and implement instruction based on knowledge of students, learning theory, connections across the curriculum, curricular goals, and community.	Candidates understand learning theory subjects taught in elementary schools, curriculum development, and student development and know how to use this understanding in planning instruction to meet curriculum goals while making connections across the disciplines. Candidates: • Are able to motivate students to appreciate and be engaged in the subject matter. • Select and create learning experiences that are appropriate for curriculum goals, meaningful to elementary students, and based upon principles of effective teaching (e.g. that activate students' prior knowledge, anticipate preconceptions, encourage exploration and problem-solving, and build new skills on those previously acquired). • Use a variety of resources, including technology and textbooks, and look beyond their classroom to determine how numerous information resources in both print and electronic form might benefit their students. • Understand and use appropriate technology to help students become capable technology users through communication; through access, management, analysis and problem solving with information; and through collaborative and self-directed learning. • Collaborate with specialists to promote learning in all areas of the curriculum for all elementary students.
3.2 Adaptation to diverse students Candidates understand how elementary students differ in their development and approaches to learning, and create instructional opportunities that are adapted to diverse students;	Candidates understand and can identify differences in approaches to learning and performance, including different learning styles and ways students demonstrate learning. Candidates: • Understand how elementary students' learning is influenced by individual experiences, talents, disabilities, and prior learning, as well as language, culture, family, and community values. • Candidates know how to seek assistance and guidance from specialists and other resources to address elementary students' exceptional learning needs and understand the importance of collaboration with specialists and families. • Identify and design instruction appropriate to K-6 students' levels of development, learning styles, strengths, and needs, using teaching approaches that are sensitive to the multiple experiences of students. • Plan instructional tasks and activities appropriate to the needs of students who are culturally diverse and those with exceptional learning needs in elementary schools. • Are able to apply knowledge of the richness of contributions from diverse cultures to each content area studied by elementary students.

3.3 Development of critical thinking and problem solving Candidates understand and use a variety of teaching strategies that encourage elementary students' development of critical thinking and problem solving.	Candidates understand cognitive processes associated with various kinds of learning and how these processes can be stimulated. Candidates: • Understand principles and techniques, advantages and limitations, associated with appropriate teaching strategies (e.g. cooperative learning, direct instruction, inquiry, whole group discussion, independent study, interdisciplinary instruction). • Know how to enhance learning through use of a wide variety of materials as well as collaboration with specialists, other colleagues, and technological resources, and through multiple teaching and learning strategies that will promote development of critical thinking, problem solving, and performance capabilities.
3.4 Active engagement in learning Candidates use their knowledge and understanding of individual and group motivation and behavior among students at the K-6 level to foster active engagement in learning, self motivation, and positive social interaction and to create supportive learning environments;	Teacher candidates understand principles of effective classroom management as well as human motivation and behavior from the foundational sciences of psychology, anthropology, and sociology. Candidates: • Use a range of strategies and can collaborate with specialists to promote positive relationships, cooperation, conflict resolution, and purposeful learning in the classroom. • Create learning communities in which elementary students assume responsibility for themselves and one another, participate in decision making, work collaboratively and independently, and engage in purposeful learning activities. • Understand and use appropriate and effective interpersonal and small group communication techniques to create an effective learning environment.
3.5 Communication to foster collaboration Candidates use their knowledge and understanding of effective verbal, nonverbal, and media communication techniques to foster active inquiry, collaboration, and supportive interaction in the elementary classroom.	Candidates understand communication theory, language development, and the role of language in learning among elementary students, and they also understand how cultural and gender differences can affect communication in the classroom. Candidates: • Model effective communication strategies in conveying ideas and information asking questions (e.g. monitoring the effects of messages restating ideas and drawing connections; using visual, aural, and kinesthetic cues; being sensitive to nonverbal cues given and received). • Use oral and written discourse between themselves and their students, and among students, to develop and extend elementary students' understanding of subject matter. • Know how to use a variety of media communication tools, including audio-visual aids and computer-based technologies, to enrich learning opportunities.

Standard 4 - Assessment	
Description	**Indicators**
4.0 Assessment for Instruction Candidates know, understand, and use formal and informal assessment strategies to plan, evaluate and strengthen instruction that will promote continuous intellectual, social, emotional, and physical development of each elementary student.	Candidates know that assessment is an essential and integral part of instruction. It defines the beginning point; helps identify objectives, materials and effective teaching methods or techniques; and informs the need to re-teach or adapt instruction. Candidates: • Understand the characteristics, uses, advantages, and limitations of different types of assessment appropriate for evaluating how K-6 students learn, what they know, and what they are able to do in each subject area. • Recognize that many different assessment tools and strategies, accurately and systematically used, are necessary for monitoring and promoting learning for each student. • Appropriately use a variety of formal and informal assessment techniques (e.g. observation, portfolios of elementary student work, teacher-made tests, performance tasks, projects, student self-assessments, peer assessment, and standardized tests) to enhance their knowledge of individual students, evaluate students' progress and performances, modify teaching and learning strategies, and collaborate with specialists on accommodating the needs of students with exceptionalities. • Use formative and summative assessments to determine student understanding of each subject area and take care to align assessments with instructional practice. • Are aware that technology can facilitate appropriate forms of assessment and provide evidence across multiple dimensions of student performance. • Use technology to improve the efficiency and effectiveness of assessment processes and in management of instruction. • Monitor their own teaching strategies and behavior in relation to student success, modifying plans and instructional approaches accordingly.
Standard 5 - Professionalism	
Description	**Indicators**
5.1 Professional growth, reflection, and evaluation Candidates are aware of and reflect on their practice in light of research on teaching, professional ethics, and resources available for professional learning; they continually evaluate the effects of their professional decisions and actions on students, families and other professionals in the learning community and actively seek out opportunities to grow professionally.	While synthesis of knowledge is a lifetime process for a professional, by the end of teacher preparation, candidates ready to enter the classroom as elementary generalist teachers should be: • Working independently on a variety of disciplinary and pedagogical problems and responsibilities by combining as appropriate their knowledge and skills in (a) child development; (b) English language arts, science, mathematics, social studies, the arts, health and physical education, (c) instructional technique and learning technologies, and (d) assessment. • Focusing and defending independent analyses and value judgments about disciplinary content and teaching methodologies, their various potential relationships, and their applications to specific circumstances. • Acquiring the intellectual tools to work with evolving issues and

	conditions as time and situations change, including the ability to make wise decisions according to time, place, and population. • Identifying, accessing, and using technology-based resources in support of their continuing professional development. • Demonstrating awareness of and commitment to the profession's codes of ethical conduct. • Understanding basic interrelationships and interdependencies among the various professions and activities that constitute the disciplines, content, and processes of elementary education. Candidates know major areas of research on teaching and of resources available for professional learning (e.g. professional literature, colleagues, professional associations, professional development activities). They use classroom observation, information about students, and research as sources for evaluating the outcomes of teaching and learning and as a basis for experimenting with, reflecting on, and revising practice.
5.2 Collaboration with families, colleagues, and community agencies Candidates know the importance of establishing and maintaining a positive collaborative relationship with families, school colleagues, and agencies in the larger community to promote the intellectual, social, emotional, physical growth and well-being of children.	Candidates understand different family beliefs, traditions, values, and practices across cultures and within society and use their knowledge effectively. Candidates: • Involve families as partners in supporting the school both inside an outside the classrooms. • Involve families in assessing and planning for individual children, including children with disabilities, developmental delays, or special abilities. • Understand schools as organizations within the larger community context and the operations of relevant aspects of the systems in which they work. • Understand how factors in the elementary students' environments outside of school may influence the students' cognitive, emotional, social, and physical well being and, consequently, their lives and learning. • Participate in collegial activities designed to make the entire school a productive learning environment and develop effective collaborations with specialists.

English as a Second Language (ESL)

Institutions and Organizations seeking State Approval for programs that prepare and result in the recommendation of candidates for licensure as teachers of English as a Second Language shall be required to demonstrate that their programs meet the following standards. The standards below are an adapted version of the 2001 Standards of Teachers of English to Speakers of Other Languages (TESOL) for the preparation of teachers of English as a Second Language.

Standard 1: Language Candidates know, understand, and use the major concepts, theories, and research related to the nature and acquisition of language to construct learning environments that support ESOL students' language and literacy development and content area achievement.	
Elements	**Indicators**
Standard 1.a. Describing Language Candidates demonstrate understanding of language as a system and demonstrate a high level of competence in helping ESOL students acquire and use English in listening, speaking, reading, and writing for social and academic purposes.	Candidates: • Apply knowledge of phonology (the sound system) to help ESOL students develop oral, reading, and writing (including spelling) skills in English. • Apply knowledge of morphology (the structure of words) to assist ESOL students' development of oral and literacy skills in English. • Apply knowledge of syntax (phrase and sentence structure) to assist ESOL students in developing written and spoken English. • Apply understanding of semantics (word/sentence meaning) to assist ESOL students in acquiring and productively using a wide range of vocabulary in English. • Apply knowledge of pragmatics (the effect of context on language) to help ESOL students communicate effectively and use English appropriately for a variety of purposes in spoken and written language, and in formal and informal settings. • Demonstrate ability to help ESOL students develop social and academic language skills in English. • Demonstrate ability to help ESOL students acquire a range of genres, rhetorical and discourse structures, and writing conventions in English. • Demonstrate understanding of the nature and value of World English and dialect variation, and build on the language that ESOL students bring in order to extend their linguistic repertoire. • Locate and use linguistic resources to learn about the structure of English and of students' home languages. • Demonstrate proficiency in English and serve as a good language model for ESOL students.
Standard 1.b. Language Acquisition and Development Candidates understand and apply concepts, theories, research, and practice to facilitate the acquisition of a primary and a new language in and out of classroom settings.	Candidates: • Provide rich exposure to English. • Provide comprehensible input and scaffolding. • Provide opportunities for meaningful interaction. • Create a secure, positive, and motivating learning environment. • Understand and apply current theories and research in language and literacy development. • Recognize and build on the processes and stages of English language and literacy development. • Recognize the importance of ESOL students' home languages and language varieties and build on these skills as a foundation for learning

	English. • Understand and apply knowledge of socio-cultural and political variables to facilitate the process of learning English. • Understand and apply knowledge of the role of individual learner variables in the process of learning English. • Provide appropriate instruction and feedback. • Help ESOL students to communicate in socially and culturally appropriate ways. • Help ESOL students develop academic language proficiency. • Help ESOL students develop effective language learning strategies.
Standard 2: Culture Candidates know, understand, and use the major concepts, principles, theories, and research related to the nature and role of culture and cultural groups to construct learning environments that support ESOL students' cultural identities, language and literacy development, and content area achievement.	
Elements	**Indicators**
Standard 2.a. Nature and Role of Culture. Candidates know, understand, and use the major concepts, principles, theories, and research related to the nature and role of culture in language development and academic achievement that support individual students' learning.	Candidates: • Understand and apply knowledge about cultural values and beliefs in the context of teaching and learning ESL. • Understand and apply knowledge about the effects of racism, stereotyping, and discrimination to ESL teaching and learning. • Understand and apply knowledge about home/school communication to enhance ESL teaching and build partnerships with ESOL families. • Understand and apply concepts about the interrelationship between language and culture.
Standard 2.b. Cultural Groups and Identity. Candidates know, understand, and use knowledge of how cultural groups and students' cultural identities affect language learning and school achievement.	Candidates: • Use a range of resources, including the Internet, to learn about world cultures and cultures of students in their classrooms and apply that learning to instruction. • Understand and apply knowledge about how an individual's cultural identity affects their ESL learning and how levels of cultural identity will vary widely among students. • Understand and apply knowledge about cultural conflicts and home-area events that can have an impact on ESOL students' learning. • Understand and apply knowledge about the impact of students' socioeconomic status, race, religion, class, national origin, disability, and gender on learning and teaching ESL. • Understand and apply knowledge of U.S. immigration history and patterns in teaching ESL.

Standard 3: Planning, Implementing, and Managing Instruction Candidates know, understand, and use standards-based practices and strategies related to planning, implementing, and managing ESL and content instruction, including classroom organization, teaching strategies for developing and integrating language skills, and choosing and adapting classroom resources.	
Elements	**Indicators**
Standard 3.a. Planning for Standards-Based ESL and Content Instruction Candidates know, understand, and apply concepts, research, and best practices to plan classroom instruction in a supportive learning environment for ESOL students. Candidates serve as effective English language models, as they plan for multilevel classrooms with learners from diverse backgrounds using standards-based ESL and content curriculum.	Candidates: • Plan standards-based ESL and content instruction. • Create environments that promote standards based language learning in supportive, accepting classrooms and schools. • Plan students' learning experiences based on assessment of language proficiency and prior knowledge. • Provide for particular needs of students with limited formal schooling (LFS).
Standard 3.b. Managing and Implementing Standards-based ESL and Content Instruction Candidates know, manage, and implement a variety of standards-based teaching strategies and techniques for developing and integrating English listening, speaking, reading, and writing, and for accessing the core curriculum. Candidates support ESOL students in accessing the core curriculum as they learn language and academic content together.	Candidates: • Organize learning around standards-based subject matter and language learning objectives. • Incorporate activities, tasks, and assignments that develop authentic uses of language, as students learn about content-area material. • Provide activities and materials that integrate listening, speaking, reading, and writing. • Develop students' listening skills for a variety of academic and social purposes. • Develop students' speaking skills for a variety of academic and social purposes. • Provide standards based instruction that builds upon students' oral English to support learning to read and write. • Provide standards based reading instruction adapted to ESOL learners. • Provide standards based writing instruction adapted to ESOL learners. • Develop students' writing through a range of activities, from sentence formation to expository writing.
Standard 3.c. Using Resources Effectively in ESL and Content Instruction Candidates are familiar with a wide range of standards-based materials, resources, and technologies, and choose, adapt, and use them in effective ESL and content teaching.	Candidates: • Select, adapt, and use culturally responsive, age-appropriate, and linguistically accessible materials. • Select materials and other resources that are appropriate to students' developing language and content area abilities, including appropriate use of L1. • Employ an appropriate variety of materials for language learning, including books, visual aids, props, and realia. • Use appropriate technological resources to enhance language and content-area instruction for ESOL students (e.g., Web, software, computers, and related devices). • Use software and Internet resources effectively in ESL and content instruction.

Standard 4: Assessment Candidates understand issues of assessment and use standards-based assessment measures with ESOL students.	
Elements	**Indicators**
Standard 4.a. Issues of Assessment for ESL Candidates understand various issues of assessment (e.g., cultural and linguistic bias; political, social, and psychological factors) in assessment, IQ, and special education testing (including gifted and talented); the importance of standards; and the difference between language proficiency and other types of assessment (e.g., standardized achievement tests of overall mastery), as they affect ESOL student learning.	Candidates: • Demonstrate an understanding of the purposes of assessment as they relate to ESOL learners and use results appropriately. • Demonstrate an understanding of the quality indicators of assessment instruments. • Demonstrate understanding of the limitations of assessment situations and make accommodations for ESOL students. • Distinguish between a language difference, gifted and talented, and special education needs for ESOL students.
Standard 4.b. Language Proficiency Assessment Candidates know and use a variety of standards-based language proficiency instruments to inform their instruction and understand their uses for identification, placement, and demonstration of language growth of ESOL students.	Candidates: • Understand and implement national and state requirements for identification, reclassification, and exit of ESOL students from language support programs. • Understand, develop, and use norm referenced assessments appropriately with ESOL learners. • Understand, develop, and use criterion-referenced assessments appropriately with ESOL learners. • Understand, construct, and use assessment measures for a variety of purposes for ESOL students. • Assess ESOL learners' language skills and communicative competence using multiple sources of information.
Standard 4.c. Classroom-Based Assessment for ESL Candidates know and use a variety of performance-based assessment tools and techniques to inform instruction.	Candidates: • Use performance based assessment tools and tasks that measure ESOL learners' progress toward state and national standards. • Use various instruments and techniques to assess • Content-area learning (e.g., math, science, social studies) for ESOL learners at varying levels of language and literacy development. • Prepare ESOL students to use self- and peer-assessment techniques when appropriate.

Standard 5: Professionalism
Candidates demonstrate knowledge of the history of ESL teaching. Candidates keep current with new instructional techniques, research results, advances in the ESL field, and public policy issues. Candidates use such information to reflect upon and improve their instructional practices. Candidates provide support and advocate for ESOL students and their families and work collaboratively to improve the learning environment.

Elements	Indicators
Standard 5.a. ESL Research and History Candidates demonstrate knowledge of history, research, and current practice in the field of ESL teaching and apply this knowledge to improve teaching and learning.	Candidates: • Demonstrate knowledge of language teaching methods in their historical contexts. • Demonstrate knowledge of the evolution of laws and policy in the ESL profession.
Standard 5.b. Partnerships and Advocacy Candidates serve as professional resources, advocate for ESOL students, and build partnerships with students' families.	Candidates: • Advocate and serve as language and education resources for students and families in their schools and communities. • Serve as professional resource personnel in their educational communities. • Advocate for ESOL students' access to all available academic resources, including instructional technology.
Standard 5.c. Professional Development and Collaboration Candidates collaborate with and are prepared to serve as a resource to all staff, including paraprofessionals, to improve learning for all ESOL students.	Candidates: • Establish professional goals and pursue opportunities to grow in the field of ESL. • Work with other teachers and staff to provide comprehensive, challenging educational opportunities for ESOL students in the school. • Engage in collaborative teaching in general education and content-area classrooms. • Model academic proficiency in the English language.

General Science

Institutions and Organizations seeking State Approval for programs that prepare and result in the recommendation of candidates for licensure as General Science teachers shall be required to demonstrate that they meet the following program standards. The standards below are an adapted version of the 2003 Standards of the National Science Teachers Association (NSTA) for the preparation of Science Teachers.

Standard 1: Content Knowledge
Teachers of science understand and can articulate the knowledge and practices of contemporary science. They can interrelate and interpret important concepts, ideas, and applications in their fields of licensure; and can conduct scientific investigations.

Elements

To show that they are prepared in content, teachers of chemistry must demonstrate that they:

a. Understand and can successfully convey to students the major concepts, principles, theories, laws, and interrelationships of their fields of licensure and supporting fields as recommended by the National Science Teachers Association.
b. Understand and can successfully convey to students the unifying concepts of science delineated by the National Science Education Standards.
c. Understand and can successfully convey to students important personal and technological applications of science in their fields of licensure.
d. Understand research and can successfully design, conduct, report and evaluate investigations in science.
e. Understand and can successfully use mathematics to process and report data, and solve problems, in their field(s) of licensure.

Indicators

All secondary science teachers should be prepared to lead students to understand the <u>unifying concepts of science</u> including:

- Multiple ways we organize our perceptions of the world and how systems organize the studies and knowledge of science.
- Nature of scientific evidence and the use of models for explanation.
- Measurement as a way of knowing and organizing observations of constancy and change.
- Evolution of natural systems and factors that result in evolution or equilibrium.
- Interrelationships of form, function, and behaviors in living and nonliving systems.

General science teachers should be prepared with a strong emphasis on collaborative inquiry in the laboratory and field. They should have a deeper understanding of the field than generalists, but should have the same thematic and interdisciplinary perspective on science. To achieve this, science teachers at this level should be prepared in biology to lead students to understand:

- Factors governing the structures, functions, and behaviors of living systems.
- Multiple systems of classification of organisms.
- Cycles of matter, and flow of energy, through living and nonliving pathways.
- Natural selection, adaptation, diversity, and speciation.
- Structure, function, and reproduction of cells, including microorganisms.
- Levels of organization from cells to biomes.
- Reproduction and heredity, including human reproduction and contraception.
- Behavior of living systems and the role of feedback in their regulation.
- Hazards related to living things including allergies, poisons, disease, and aggression.

In relation to the physical sciences, general science teachers at this level should be prepared in chemistry and physics to lead students to understand:

- Properties and applications of sound, light, magnetism, and electricity.
- Potential and kinetic energies and concepts of work.
- Energy flow in physical and chemical systems, including simple machines
- States of matter and bonding in relation to molecular behavior and energy.
- Conservation of matter and energy.
- Classifications of elements and compounds.
- Solvents (especially water) and solutions.
- Chemical nature of the earth and its living organisms.
- Nature of radioactive substances.
- Chemical, electrical and radiation hazards.

In the Earth and space sciences, general science teachers at this level should prepared in the Earth and space sciences to lead students to understand:

- Structures of objects and systems in space.
- Earth's structure, evolution, history, and place in the solar system.
- Characteristics and importance of oceans, lakes, rivers, and the water cycle.
- Characteristics of the atmosphere including weather and climate.
- Changes in the Earth caused by chemical, physical, and biological forces.
- Causes and occurrences of hazards such as tornados, hurricanes, and earthquakes.
- Characteristics and importance of cycles of matter such as oxygen, carbon, and nitrogen.
- Characteristics of renewable and nonrenewable natural resources and implications for their use.
- Interactions among populations, resources, and environments.

To create interdisciplinary perspectives and to help students understand why science is important to them, science teachers should be prepared to lead students to understand:

- Interrelationships of pure and applied sciences, and technology.
- Applications of science to local and regional problems and the relationship of science to one's personal health, well-being, and safety.
- Historical development and perspectives on science including contributions of underrepresented groups and the evolution of major ideas and theories.
- Applications of science to the investigation of individual and community problems.
- Use of technological tools in science, including calculators and computers.

Standard 2: Nature of Science

Teachers of science engage students effectively in studies of the history, philosophy, and practice of science. They enable students to distinguish science from non-science, understand the evolution and practice of science as a human endeavor, and critically analyze assertions made in the name of science.

Elements

To show they are prepared to teach the nature of science, teachers of science must demonstrate that they:

a. Understand the historical and cultural development of science and the evolution of knowledge in their discipline.

b. Understand the philosophical tenets, assumptions, goals, and values that distinguish science from technology and from other ways of knowing the world.

c. Engage students successfully in studies of the nature of science including, when possible, the critical analysis of false or doubtful assertions made in the name of science.

Indicators

All students of science, whether teacher candidates or not, should have knowledge of the nature of science as defined in this standard, and should have the skills needed to engage students in the critical analysis of scientific and pseudoscientific claims in an appropriate way. This requires explicit attention to the nature of science, as defined in this standard, as a part of the preparation of science teachers.

Candidates should:

- Have multiple opportunities to study and analyze literature related to the history and nature of science, such as The Demon Haunted World (Sagan, 1996); Great Feuds in Science (Hellman, 1998) Facts, Fraud and Fantasy (Goran, 1979) and The Structure of Scientific Revolutions (Kuhn, 1962).
- They should be required to analyze, discuss and debate topics and reports in the media related to the nature of science and scientific knowledge in courses and seminars throughout the program, not just in an educational context. Students should engage in active investigation and analysis of the conventions of science as reflected in papers and reports in science, across fields, in order to understand similarities and differences in methods and interpretations in science, and to identify strengths and weaknesses of findings.
- Demonstrate that they are effective by successfully engaging students in the study of the nature of science. Assessments with regard to understanding may include such possibilities as completion of independent study courses, seminars or assignments; projects; papers; summative readings; or case study analyses. Assessments of effectiveness must include at least some demonstrably positive student outcomes in studies related to the nature of science as delineated by the standards in this cluster.

Standard 3: Inquiry

Teachers of science engage students both in studies of various methods of scientific inquiry and in active learning through scientific inquiry. They encourage students, individually and collaboratively, to observe, ask questions, design inquiries, and collect and interpret data in order to develop concepts and relationships from empirical experiences.

Elements

To show that they are prepared to teach through inquiry, teachers of science must demonstrate that they:

a. Understand the processes, tenets, and assumptions of multiple methods of inquiry leading to scientific knowledge.
b. Engage students successfully in developmentally appropriate inquiries that require them to develop concepts and relationships from their observations, data, and inferences in a scientific manner.

Indicators

- Candidates in a science teacher preparation program should be provided with multiple opportunities to solve open-ended problems using appropriate scientific methods. These opportunities should be present in their science content courses, but also should be fundamental in their science methods preparation. Many candidates enter teaching because they want to impart knowledge: It is not easy for them to lead students by listening and questioning, and to allow students to infer proposed solutions to problems. Practice is essential.
- The preparation of teachers for the elementary level, especially generalists, should require inquiry-based university science courses. Stalheim-Smith and Scharmann (1996) and Stoddart, Connell, Stofflett and Peck (1993) found that the use of constructivist teaching methodologies and learning cycles, methods that are generally inquiry-based, improved the learning of science by candidates in elementary education. Such courses also may increase the confidence level of generalists, who are often not confident in their ability to do science.
- Secondary programs should also strongly emphasize inquiry and pay close attention to preparing teachers to effectively lead students in such activities. All programs should provide explicit instruction in the nature of inquiry as well as its applications. Like the nature of science, inquiry is not learned well simply through practice. In general, the term "scientific method" (for the hypothetico-deductive method) should be avoided, since it may lead students to believe there is only one way to conduct scientific inquiries. Inductive studies have played a valuable role in science, as have mathematical and computer modeling. Hypotheses are not

used formally by scientists in all research, nor are experiments per se the substance of all research. Candidates should study cases in which different approaches to inquiry are used in science, and should endeavor to communicate such differences to their students.

- The role of the teacher is not just to engage students in inquiry in order to develop their conceptual knowledge and process skills, but also to increase their understanding of how scientific inquiries are conducted, and how decisions are made in science. In this regard, the inquiry standards overlap and support the nature of science standards.
- Inquiry demands skill in the analysis of data and assessment of results to reach reasonable and valid conclusions. Candidates must be able to demonstrate not only that they know and understand common and different modes of scientific inquiry, but also that they can and do effectively engage students in inquiries. They should be able to demonstrate their effectiveness through student data profiles or similar means that they are effective in conducting such activities.

Standard 4: Issues

Teachers of science recognize that informed citizens must be prepared to make decisions and take action on contemporary science- and technology-related issues of interest to the general society. They require students to conduct inquiries into the factual basis of such issues and to assess possible actions and outcomes based upon their goals and values.

Elements

To show that they are prepared to engage students in studies of issues related to science, teachers of science must demonstrate that they:

a. Understand socially important issues related to science and technology in their field of licensure, as well as processes used to analyze and make decisions on such issues.
b. Engage students successfully in the analysis of problems, including considerations of risks, costs, and benefits of alternative solutions; relating these to the knowledge, goals and values of the students.

Indicators

- Science teacher preparation programs should give explicit attention to the study of socially important issues related to science and technology such as species preservation, land use, chemical pollution, weapons development, and cloning, to name but a few. Such issues may be introduced in science courses, but seldom do science courses provide for structured cost-benefit analyses or decision-making on these issues that considers all perspectives. Programs must ensure that candidates are prepared to lead students in learning how to dissect and analyze issues using data and information as resources.
- The question of how to consider an issue is just as important as the issues considered. To that end, candidates will themselves need to learn how to explore issues with an open mind. Once this is accomplished, they will need to learn how to lead students to explore these issues with the goal of making an informed and justified decision.
- To meet this standard, candidates must demonstrate that they are aware of important issues and are knowledgeable of approaches to analyzing these issues. Candidates should access common sources of information (newspapers, magazines, televised reports) to relate their science instruction to contemporary issues and events. They must then demonstrate through student achievement that they are able to effectively lead them in the study of an important issue.

Standard 5: General Skills of Teaching

Teachers of science create a community of diverse learners who construct meaning from their science experiences and possess a disposition for further exploration and learning. They use, and can justify, a variety of classroom arrangements, groupings, actions, strategies, and methodologies.

Elements

To show that they are prepared to create a community of diverse learners, teachers of science must demonstrate that they:

a. Vary their teaching actions, strategies, and methods to promote the development of multiple student skills and levels of understanding.
b. Successfully promote the learning of science by students with different abilities, needs, interests, and backgrounds.
c. Successfully organize and engage students in collaborative learning using different student group learning strategies.
d. Successfully use technological tools, including but not limited to computer technology, to access resources, collect and process data, and facilitate the learning of science.
e. Understand and build effectively upon the prior beliefs, knowledge, experiences, and interests of students.
f. Create and maintain a psychologically and socially safe and supportive learning environment.

Indicators

- The standards under the general teaching cluster are largely skills based and must be demonstrated by data from the classroom. Not all of the standards require demonstrations of student achievement or performance, but where effectiveness must be demonstrated, data from students should be used.
- Programs should provide candidates with ample opportunities to work with students using well-defined indicators of effective pedagogy. Candidates must go beyond demonstrating that they can create varied plans for instruction (as in a methods course) and actually implement a unit that has appropriate variety.
- Not all schools have diversity in terms of racial or ethnic makeup, but almost all have variations in socio-economic status, gender and learning styles. Candidates should be able to show how they have considered such differences in their planning and teaching. These considerations may be directed at a group or at individuals. For example, demonstrating the ability to make appropriate provisions for a student who does not speak English well, or who has a defined disability might be acceptable evidence of adapting instruction.
- The ability to use structured collaborative learning effectively is an important part of Standard 15. This includes, but goes beyond, setting up effective lab groups. Strategies such as Teams-Games-Tournament (TGT) and Student Teams, Achievement Division (STAD) are examples of alternative ways to organize instruction, where students teach each other (Slavin, 1996).
- Technology use is the emphasis of standard 16, as opposed to teaching about technology in contrast with science. The availability of technology in schools may limit the ability of some candidates to demonstrate their performance with students. If a teacher preparation program is situated in an area where computer technology is not common in the schools, it may be necessary to purchase laptops and lab ware for use in the schools.

- Pretesting and preconceptions surveys are excellent ways for candidates to determine the prior conceptual knowledge of their students. Candidates should also be able to show how they used prior conceptions and variations in the knowledge of their students to plan instruction in relation to the target concept.
- The cooperating teacher, using a rubric designed by the program, may assess classroom atmosphere. The candidate may also collect student feedback using an instrument of his or her own design.

Standard 6: Curriculum

Teachers of science plan and implement an active, coherent, and effective curriculum that is consistent with the goals and recommendations of the National Science Education Standards. They begin with the end in mind and effectively incorporate contemporary practices and resources into their planning and teaching.

Elements

To show that they are prepared to plan and implement an effective science curriculum, teachers of science must demonstrate that they:

a. Understand the curricular recommendations of the National Science Education Standards, and can identify, access, and/or create resources and activities for science education that are consistent with the standards.
b. Plan and implement internally consistent units of study that address the diverse goals of the National Science Education Standards and the needs and abilities of students.

Indicators

- Teacher candidates should engage in planning and implementing lessons and units of instruction early and often, and should be held responsible for demonstrating such planning throughout the program. With little experience in teaching, candidates may find such planning difficult and time-consuming. There is a tendency among novices to fall back upon activities for their own sake, rather than to deliberately plan a lesson or a unit with concern for how it might be made more effective. Practice in implementing units that have been designed to portray the National Science Education Standards and that have been field-tested may offer an opportunity to practice inquiry based teaching in a supportive context with a high probability of success.
- Resource units or collections of related materials are one way candidates can be shown to be familiar with a wide variety of materials in relation to a particular topic. Lesson plans and unit plans are generally required in most programs and can be used as data to verify that the program addresses the standards.
- Candidates can be asked to formally assess the internal consistency of their plans using program criteria and may create a reflective narrative to explain that assessment. This assessment may then be returned as part of a portfolio or as an independent assessment and may be used by the program to verify candidate skills.

Standards 7: Science in the Community

Teachers of science relate their discipline to their local and regional communities, involving stakeholders and using the individual, institutional, and natural resources of the community in their teaching. They actively engage students in science-related studies or activities related to locally important issues.

Elements

To show that they are prepared to relate science to the community, teachers of science must demonstrate that they:

a. Identify ways to relate science to the community, involve stakeholders, and use community resources to promote the learning of science.
b. Involve students successfully in activities that relate science to resources and stakeholders in the community or to the resolution of issues important to the community.

Indicators

- To meet this standard, candidates must know the community in which they teach. Programs should provide candidates with the background and tools they need to learn about the community. This could include a community survey or visits to a community website that provides demographic and resource information about the community. Candidates should also know how to obtain information from their students that might help them to understand their needs, and might lead to guest speakers from the students' families.
- A good resource for finding out about the community is the local newspaper. News media may report on issues relevant to science and technology, which then may be used as the focus of discussion and cost-benefit analysis. It may be desirable for candidates to create and maintain a resource list for topics in their field and arrange to either take students to the field or have guest speakers come in. The Internet can also be a useful tool for finding resources in some communities.

- It is not always necessary for candidates to arrange for guest speakers or a field trip in order to make use of community resources. Students, alone or in small study groups, may be asked to investigate questions, collect data, visit sites¸ attend presentations, or interview people after school or on weekends.

Standards 8: Assessment

Teachers of science construct and use effective assessment strategies to determine the backgrounds and achievements of learners and facilitate their intellectual, social, and personal development. They assess students fairly and equitably, and require that students engage in ongoing self-assessment.

Elements

To show that they are prepared to use assessment effectively, teachers of science must demonstrate that they:

a. Use multiple assessment tools and strategies to achieve important goals for instruction that are aligned with methods of instruction and the needs of students.
b. Use the results of multiple assessments to guide and modify instruction, the classroom environment, or the assessment process.
c. Use the results of assessments as vehicles for students to analyze their own learning, engaging students in reflective self-analysis of their own work.

Indicators

- An important tenet of education is that the mode of assessment often drives methods of instruction rather than the other way around. The very nature of a performance based teacher preparation program requires candidates to pay far more attention to determining the results of instruction than has been necessary in the past.
- Multiple assessment tools should be aligned with the multiple purposes of instruction. Candidates should be called upon to justify their selection of assessment tools in relation to the purposes of the instruction. For example, it is clearly inconsistent to use a multiple-choice quiz to assess the result of an open inquiry. Variety of assessments does not just include different kinds of traditional and nontraditional assessments, but also assessments to measure different dimensions of learning—cognitive, affective and psychomotor knowledge and skills—and dispositions of students.
- It would be expected that candidates should show at least some disposition to use assessments to guide and change instruction. These assessments may be formal or informal, formative or summative. A supervisor may note this occurring and assistant the candidate in reflecting upon this change. Alternatively, candidates may use pretests or may collect data formatively to determine whether further instruction on a concept or in a skill is needed. Some teachers have found it effective to asks students at the end of each class period to write something they have learned that day; they have then used the student response to guide their work the next day and clear up misconceptions or misunderstandings.
- It is also important that teachers be able to involve students in self-analysis. Too often assessment is something done to students. It takes little effort for candidates to include items that require student reflection on tests, projects, or activities they have completed. Conferencing with students using data from their assessments may also be a way of involving students in self assessment as long as the students themselves are doing the assessing: such conferences would not meet standard 25 if it is just another form of teacher assessment.

Standard 9: Safety and Welfare

Teachers of science organize safe and effective learning environments that promote the success of students and the welfare of all living things. They require and promote knowledge and respect for safety, and oversee the welfare of all living things used in the classroom or found in the field.

Elements

To show that they are prepared, teachers of science must demonstrate that they:

a. Understand the legal and ethical responsibilities of science teachers for the welfare of their students, the proper treatment of animals, and the maintenance and disposal of materials.
b. Know and practice safe and proper techniques for the preparation, storage, dispensing, supervision, and disposal of all materials used in science instruction.
c. Know and follow emergency procedures, maintain safety equipment, and ensure safety procedures appropriate for the activities and the abilities of students.
d. Treat all living organisms used in the classroom or found in the field in a safe, humane, and ethical manner and respect legal restrictions on their collection, keeping, and use.

Indicators

- Teacher preparation programs must ensure that candidates possess the knowledge needed to maintain a safe environment for all students. This includes knowledge of how to avoid or control hazardous materials or organisms, how to prepare and/or store materials properly, and how to clean up spills and dispose of chemicals safely.
- Candidates must know how to check and use safety equipment properly and the hazards of improperly shielded equipment, and must be able to avoid risks from fire hazards and biological contaminants.
- It is also important that candidates actually behave in a safe manner, model ethical and safe behavior, and ensure that students behave safely at all times. They must give proper safety instruction and causations, and must label materials and equipment in such a way as to maintain safety.
- In addition to safety concerns, candidates who may keep or use animals in the classroom or field should be knowledgeable of their care. They should know and comply with laws and professional standards for classroom treatment of animals and should be aware of regulations controlling the use of sentient, usually vertebrate, animals. They should be able to properly maintain the environment of the animals and dispose of wastes, respond to the illness of the animals and ensure that they have the food, water, space, shelter and care needed for their well-being.
- Where candidates may use viruses, microorganisms, or other living things potentially harmful to students, candidates should know how to clean up the classroom and dispose of materials in order to maintain safety for students and anyone who may encounter such materials. Chemical hazards or biohazards must be dealt with according to rules and regulations that apply to all laboratories.
- Candidates should know and respect restrictions on collecting and using plants and animals, or parts of plants and animals, from the wild. They should be aware of the potential hazards of common plants as well as animals.
- Finally, they should know the common emergency precautions, responses, and reporting procedures that they are to follow in the event problems arise.
- Both knowledge and behaviors are essential components in demonstrating that this standard is met. Safety readings, tests, artifacts, projects, classroom safety evaluations, and so forth may be used to demonstrate knowledge and attention to safety matters. Reviews of regulations related to the collection and use of living things and general guidelines for safety and use of living things may also contribute to evidence of preparation. Actual performance in the classroom might be demonstrated by completion of a safety and ethical behaviors rubric or checklist by cooperating teachers.

Standard 10: Professional Growth

Teachers of science strive continuously to grow and change, personally and professionally, to meet the diverse needs of their students, school, community, and profession. They have a desire and disposition for growth and betterment.

Elements

To show their disposition for growth, teachers of science must demonstrate that they:

a. Engage actively and continuously in opportunities for professional learning and leadership that reach beyond minimum job requirements.
b. Reflect constantly upon their teaching and identify ways and means through which they may grow professionally.
c. Use information from students, supervisors, colleagues and others to improve their teaching and facilitate their professional growth.
d. Interact effectively with colleagues, parents, and students; mentor new colleagues; and foster positive relationships with the community.

Indicators

- Programs must help candidates the professional community as science educators.
- Science teaching is a composite profession requiring knowledge and skills in both science and education. Ideally, these skills come together in the preparation program.
- Associations and activities related to science teaching are abundant. Participation in such activities at the local, state and national levels should be encouraged, some being required.
- They are a resource for improving one's teaching, but also they provide the opportunity for constructive interaction with others in the same field.
- Teacher preparation programs should keep records of such activity so that they may then try to increase the activity of their candidates year by year.
- The best teachers tend to be goal-focused, but flexible and reflective. These characteristics allow them to relate to students and to modify and improve their practices.
- Candidates in teacher preparation programs must demonstrate the ability to reflect, but also to respond positively to constructive feedback from others. Few teacher educators are unfamiliar with candidates who enter their programs with preset ideas that they refuse to change, even when students do not respond well to them. It is imperative that such individuals not be allowed to continue on into teaching.
- The ability to get along with others is crucial in education, certainly with students, but also with other stakeholders such as teachers, administrators, support staff and parents.
- Dispositional factors can be assessed through the behaviors of candidates; candidates should be held accountable for behaviors that are contrary to the expectations of the profession as determined by the faculty and reflected in these standards.
- Carefully constructed criteria are needed and may be used as a source of data for candidate preparation and practice by the program.

Elements	Indicators
1.a Candidates obtain health-related data about social and cultural environments, growth and development factors, needs, and interests of students.	Candidates: • Select valid, reliable, and credible sources of data and information about health needs, interests, and concerns. • Use technology-based sources of information. • Identify appropriate data-gathering instruments. • Apply various methods to collect health-related data and information.
1.b Candidates distinguish between behaviors that foster and those that hinder well-being.	Candidates: • Identify physical, social, emotional, intellectual, and other factors that influence one or more health-related behaviors of school-aged youth. • Distinguish between risk and protective factors within the family, school, peer group, and community. • Identify individual behaviors that promote and/or compromise personal health and well-being. • Articulate how cognitive, affective, and skill-based learning and other experiences impact patterns of health behavior.
1.c Candidates determine health education needs based on observed and obtained data.	Candidates: • Review, display, and interpret needs assessment data for diverse student populations. • Establish criteria for prioritizing areas based on diverse student needs. • Apply established criteria to identify priority needs for school-based health education and CSHPs.

Health and Physical Education

Institutions and Organizations seeking State Approval for programs that prepare and result in the recommendation of candidates for licensure as teachers of Health and Physical Education shall be required to demonstrate that they meet the following program standards. The standards below are an adapted version of the 2001 Standards of the American Association for Health Education (AAHE) for the preparation of Health Education Teachers; the 2001 standards of the American Alliance for Health, Physical Education, Recreation, and Dance (AAPHERD); and the National Association for Sport and Physical Education (NASPE) for the preparation of Physical Education Teachers.

Health Standard 2 - Candidates plan effective health education programs.	
Elements	**Indicators**
2.a Candidates recruit school and community representatives to support and assist in program planning.	Candidates: • Identify individuals and/or groups whose cooperation and support will be essential to program success. • Integrate other school and community resources and recommendations within the health education program plan.

2.b Candidates develop a logical scope and sequence plan for a health education	Candidates: • Apply decision-making, communication, goal-setting, self-

program.	management, and advocacy skills as they relate to health content. • Display functional knowledge of health concepts related to alcohol and other drugs, injury prevention, nutrition, physical activity, sexual health, tobacco, mental health, personal and consumer health, and community and environmental health. • Determine the range of essential health concepts and skills that are developmentally-appropriate and culturally-sensitive to a diverse student population. • Organize and prioritize the scope of a health education program in a logical sequence.
2.c Candidates formulate appropriate and measurable learner objectives.	Candidates: • Use the scope and sequence plan and state/national standards and guidelines to designate performance indicators that describe functional health concepts and essential student skills. • Design measurable cognitive, affective, and skills-based learner objectives that are developmentally-appropriate. • Review and revise performance indicators based on current needs assessment findings.
2.d Candidates design educational strategies consistent with specified learner objectives.	Candidates: • Access and review existing or new health education curricula for consistency with performance indicators and research-based best practice. • Delineate a wide variety of instructional strategies aligned to meet diverse student needs. • Plan service learning opportunities that reinforce mastery of previously identified learner objectives.
Health Standard 3 - Candidates implement health education programs.	
Elements	**Indicators**
3.a Candidates analyze factors affecting the successful implementation of health education and Coordinated School Health Programs (CSHPs).	Candidates: • Gather information about students' previous knowledge, attitudes, perceptions, and skills to determine readiness for proposed instructional strategies. • Identify supports and barriers to successful implementation of health education curricula and CSHPs and strategies to overcome barriers.
3.b Candidates select resources and media best suited to implement program plans for diverse learners.	Candidates: • Analyze diverse learner characteristics and other factors when choosing appropriate materials, technology, and media. • Access and use state-of-the-art resources, educational media, and instructional technology and equipment. • Develop criteria for choosing most promising instructional resources and CSHP strategies to match objectives for diverse learners.

3.c Candidates exhibit competence in carrying out planned programs.	Candidates: • Employ "best practice" experiential methods that impact

	cognitive, affective, and skill domains. • Apply pedagogically sound learning strategies for diverse individuals and groups. • Use developmentally-appropriate and culturally-sensitive classroom strategies and service-learning experiences to support designated learner objectives. • Manage classroom logistics and maintain order. • Request, access, and use available facilities and space for instruction. • Effectively use a variety of resources and media.
3.d Candidates monitor educational programs, adjusting objectives and instructional strategies as necessary.	Candidates: • Monitor educational strategies, resources, and materials as relevant to learner objectives. • Address emerging student questions, concerns, and interests on an ongoing basis. • Monitor student work as it relates to stated student outcomes. • Revise learner objectives and instructional strategies to meet emerging diverse student needs.
Health Standard 4 - Candidates evaluate the effectiveness of coordinated school health programs.	
Elements	**Indicators**
4.a Candidates develop plans to assess student achievement of program objectives.	Candidates: • Develop standards of performance as criteria for assessing impact on student learning. • Devise a realistic and feasible evaluation plan that spans health education and CSHP implementation. • Develop an electronic inventory of valid and reliable evaluation instruments. • Select appropriate formative and summative evaluation methods to determine student progress and levels of CSHP implementation and impact.
4.b Candidates carry out evaluation plans.	Candidates: • Delineate steps to implement evaluation plans; administer measurement instruments as specified in evaluation plan. • Use appropriate data collection methods to assess impact on student learning. • Use computer technology and basic statistical procedures to input and analyze evaluation data.
4.c Candidates interpret results of program evaluation.	Candidates: • Use evaluation results to determine impact of instruction on student learning and group progress based on criteria stated in performance indicators. • Interpret evaluation results. • Demonstrate dispositions and skills to present findings to students, families, school personnel, and community members. • Identify limitations of evaluation design. • Use aggregate data to recommend changes in health instruction.

4.d Candidates infer implications of evaluation findings for future program	Candidates: • Interpret evaluation results to draw inferences about future

planning.	program efforts. • Describe relationships among student outcomes, candidate dispositions and skills, and evaluation strategies. • Explore possible explanations for evaluation findings. • Provide explanations for bias in evaluation results. • Use results to determine and recommend modifications of instructional program and/or CSHPs.
Health Standard 5 - Candidates coordinate provision of health education programs and services.	
Elements	**Indicators**
5.a Candidates develop a plan for coordinating health education with other components of a school health program.	Candidates: • Describe components of a CSHP. • Explain the value of coordinating CSHP components. • Determine the extent of existing health-related programs and services in the school and community. • Identify gaps and duplication in the provision of CSHP. • Develop a plan for coordination of CSHP.
5.b Candidates demonstrate the dispositions and skills to facilitate cooperation among health educators, other teachers, and appropriate school staff.	Candidates: • Identify formal and informal channels of communication. • Demonstrate disposition and skill to facilitate cooperation among school-site staff and staff at other schools and/or the district-level. • Analyze the role of school health educators as liaisons among CSHP staff and representatives of community-based agencies and organizations.
5.c Candidates formulate practical modes of collaboration among health educators in all settings and other school and community health professionals.	Candidates: • Describe strategies for enhancing communication among health educators and other personnel responsible for school and community health-related programs and services. • Suggest approaches for integrating comprehensive health education with community programs. • Identify commonalities and differences among selected health agencies and organizations. • Specify the benefits and challenges of collaboration.
5.d Candidates organize professional development programs for teachers, other school personnel, community members, and other interested individuals	Candidates: • Plan competency-based professional development sessions. • Determine appropriate educational and technological resources and instructional methods to meet diverse needs of teachers and other school personnel.

Health Standard 6 - Candidates act as a resource person in health education.

Elements	Indicators
6.a Candidates utilize computerized health information retrieval systems effectively.	Candidates: • Use basic communication technologies/applications (e.g., electronic mail, data processing, graphics programs, word processing). • Use the Internet to access health research database and surveillance systems and interact with web-based programs. • Identify on-line learning activities and resources aligned with health instructional goals and meaningful to students. • Use a variety of communication and technology systems that provide health information (e.g., compact discs, DVD players, videotape and audio tape, teleconferences/ videoconferences). • Evaluate computerized health information for validity, reliability, credibility, and accuracy.
6.b Candidates establish effective consultative relationships with those requesting assistance in solving health-related problems.	Candidates: • Reflect on need for communication skills in effective consultative relationships. • Demonstrate dispositions and skills to interact and communicate with other school staff, students, parents, and community stakeholders. • Discuss ethical and professional dispositions related to student disclosure and confidentiality, sensitive issues, and adherence to school policy and state mandates. • Identify specialists and services available for students in crisis.
6.c Candidates interpret and respond to requests for health information.	Candidates: • Use data from national, state, and local child and adolescent health research to respond to requests for information about health issues, school policy development, and adoption of health curricula. • Help all students locate current, reliable, and credible sources of information. • Identify health and safety youth-serving organizations, agencies, and associations.
6.d Candidates select effective educational resource materials for dissemination.	Candidates: • Select, assemble, and distribute valid and reliable health information related to diverse school-aged youth. • Formulate criteria for selection of instructional materials.

Health Standard 7 - Candidates communicate health and health education needs, concerns, and resources.

Elements	Indicators
7.a Candidates interpret concepts, purposes, and theories of health education.	Candidates: • Define health education and identify current goals, objectives, and practice in diverse settings; examine educational, psychological, sociological, and anthropological theory in relation to health education practice. • Describe the historical basis of health education. • Reflect on knowledge, dispositions, and skills of health educators.
7.b Candidates predict the impact of societal value systems on health education	Candidates: • Investigate potential impact of social forces, values, and systems

programs.	on individual and community perspectives related to health issues. • Identify strategies for dealing with controversy related to health education needs and concerns.
7.c Candidates select a variety of communication methods and techniques in providing health information.	Candidates: • Deliver health-promoting messages clearly and concisely. • Identify a range of strategies for communicating health information to individuals, small groups, and large groups. • Facilitate small and large group discussions by modeling appropriate dispositions and skills.
7.d Candidates foster communication between health care providers and consumers.	Candidates: • Identify factors influencing students' and parents' understanding of health information and acceptance of health services. • Translate scientific concepts for understanding by students, parents, and staff. • Act as a liaison between health care providers and diverse students, parents, and staff.

Physical Education Standard 1: Content Knowledge
Physical education teachers understand physical education content and disciplinary concepts related to the development of a physically educated person.

Elements	Indicators
1.1 Identify critical elements of motor skill performance, and combine motor skills into appropriate sequences for the purpose of improving learning.	Teacher candidates satisfactorily demonstrate the ability to identify critical elements both verbally and by written analysis. Motor skills are combined sequentially to facilitate motor performance.
1.2 Demonstrate competent motor skill performance in a variety of physical activities.	Teacher candidates demonstrate competent motor skill performance in several physical activities and proficiency in some.
1.3 Describe performance concepts and strategies related to skillful movement and physical activity (e.g., fitness principles, game tactics, skill improvement principles).	Teacher candidates demonstrate an understanding of concepts and strategies related to skillful movement through accurate analysis of "why" movement performance occurs as it does, and by the identification of factors that distinguish novice from expert movement performance.
1.4 Describe and apply bioscience (anatomical, physiological, and biomechanical) and psychological concepts to skillful movement, physical activity, and fitness.	Teacher candidates demonstrate bioscience knowledge and use this knowledge appropriately to plan and teach for skillful movement, physical activity, and fitness.
1.5 Understand and debate current physical education/activity issues and laws based on historical, philosophical, and sociological perspectives.	Teacher candidates demonstrate the ability to think critically about issues related to physical activity, through verbal and written analysis, and an understanding of the law as it relates to Physical Education teaching.
1.6 Demonstrate knowledge of approved state and national content standards and local program goals.	Teacher candidates are able to demonstrate, through verbal and written documentation, knowledge of approved standards including the content standards for Physical Education.

Physical Education Standard 2: Growth and Development.
Physical education teachers understand how individuals learn and develop and can provide opportunities that support their physical, cognitive, social, and emotional development.

Elements	Indicators
2.1 Monitor individual and group performance in order to design safe instruction that meets student developmental needs in the physical, cognitive, and social/emotional domains.	Teacher candidates demonstrate the ability to determine student needs through appropriate monitoring which is followed by design of safe learning environments.
2.2 Understand the biological, psychological, sociological, experiential, and environmental factors (e.g. neurological development, physique, gender, socio-economic status) that impact developmental readiness to learn and refine movement skills.	Teacher candidates can identify and implement developmentally appropriate learning opportunities for a whole class, and are able to extend and refine content for the class as appropriate.
2.3 Identify, select, and implement appropriate learning/practice opportunities based on understanding the student, the learning environment, and the task.	Teacher candidates demonstrate understanding of the interaction of student, learning environment, and task, and can identify/select appropriate learning/practice opportunities based on this understanding.

Physical Education Standard 3: Diverse Students
Physical education teachers understand how individuals differ in their approaches to learning, and create appropriate instruction adapted to these differences.

Elements	Indicators
3.1 Identify, select, and implement appropriate instruction that is sensitive to students' strengths/weaknesses, multiple needs, learning styles, and prior experiences (e.g., cultural, personal, family, community).	Teacher candidates demonstrate the ability to identify, select, and implement appropriate instruction based on student needs.
3.2 Use appropriate services and resources to meet diverse learning needs.	Teacher candidates use appropriate strategies, services, and resources to meet diverse learning needs.

Physical Education Standard 4: Management and Motivation
Physical education teachers use an understanding of individual and group motivation and behavior to create a safe learning environment that encourages positive social interaction, active engagement in learning, and self-motivation.

Elements	Indicators
4.1 Use managerial routines that create smoothly functioning learning experiences and environments.	Teacher candidates are able to use managerial routines that create smoothly functioning learning experiences.
4.2 Organize, allocate, and manage resources (e.g., students, time, space, equipment, activities, teacher attention) to provide active and equitable learning experiences.	Teacher candidates are able to organize, allocate, and manage resources (e.g., students, time, space, equipment, activities, and teacher attention) to provide active and equitable learning experiences.
4.3 Use a variety of developmentally appropriate practices to motivate students to participate in physical activity inside and outside of the school.	Teacher candidates use a variety of developmentally appropriate practices to motivate school age students to participate in physical activity inside and outside of the school.

4.4 Use strategies to help students demonstrate responsible personal and social behaviors (e.g., mutual respect, support for others, safety, cooperation) that promote positive relationships and a productive learning environment.	Teacher candidates use appropriate strategies to help students demonstrate responsible personal and social behaviors (e.g., mutual respect, support for others, safety, and cooperation) that promote positive relationships and a productive learning environment.
4.5 Develop an effective behavior management plan	Teacher candidates are able to develop an effective behavior management plan.

Physical Education Standard 5: Communication

Physical education teachers use knowledge of effective verbal, nonverbal, and media communication techniques to enhance learning and engagement in physical activity settings.

Elements	Indicators
5.1 Describe and demonstrate effective communication skills (e.g., use of language, clarity, conciseness, pacing, giving and receiving feedback, age appropriate language, nonverbal communication).	Teacher candidates demonstrate effective communication skills (e.g., use of language, clarity, conciseness, pacing, giving and receiving feedback, age appropriate language, non-verbal communication.
5.2 Communicate managerial and instructional information in a variety of ways (e.g., bulletin boards, music, task cards, posters, Internet, video).	Teacher candidates communicate managerial and instructional information in a variety of ways (e.g., bulletin boards, music, task cards, posters, Internet, video).
5.3 Communicate in ways that demonstrate sensitivity to all students (e.g., considerate of ethnic, cultural, socio-economic, ability, gender differences).	Teacher candidates communicate in ways that demonstrate sensitivity to all students (e.g., considerate of ethnic, cultural, socio-economic, ability, gender differences).
5.4 Describe and implement strategies to enhance communication among students in physical activity settings.	Teacher candidates implement strategies to enhance communication among students in physical activity settings.

Physical Education Standard 6: Planning and Instruction

Physical education teachers plan and implement a variety of developmentally appropriate instructional strategies to develop physically educated individuals, based on state and national (NASPE K-12) standards.

Elements	Indicators
6.1 Identify, develop, and implement appropriate program and instructional goals.	Teacher candidates identify, develop, and implement developmentally appropriate program and instructional goals and demonstrate effective goal setting techniques.
6.2 Develop long and short-term plans that are linked to both program and instructional goals, and student needs.	Teacher candidates demonstrate the ability to develop short and long term plans that are linked to both learning goals, student needs/performance.
6.3 Select and implement instructional strategies, based on selected content, student needs, and safety issues, to facilitate learning in the physical activity setting.	Teacher candidates select and implement instructional strategies that are based on content, student needs, and safety issues, to facilitate student learning.
6.4 Design and implement learning experiences that are safe, appropriate, relevant, and based on principles of effective instruction.	Teacher candidates are able to design and implement learning experiences that are safe, developmentally appropriate, and based on principles of effective instruction.

6.5 Apply disciplinary and pedagogical knowledge in developing and implementing effective learning environments and experiences.	Teacher candidates demonstrate the ability to apply disciplinary and pedagogical knowledge in developing and implementing effective instruction.
6.6 Provide learning experiences that allow students to integrate knowledge and skills from multiple subject areas.	Teacher candidates demonstrate, through effective lesson planning and implementation, the understanding that Physical Education can provide an environment for integrated learning experiences that draw on students' classroom experiences.
6.7 Select and implement appropriate (i.e., comprehensive, accurate, useful, safe) teaching resources and curriculum materials.	Teacher candidates demonstrate their ability to select and implement developmentally appropriate (i.e., comprehensive, accurate, useful, and safe) teaching resources and curriculum materials.
6.8 Use effective demonstrations and explanations to link physical activity concepts to appropriate learning experiences.	Teacher candidates are able to use effective demonstrations and explanations to link physical activity concepts to appropriate physical activity experiences.
6.9 Develop and use appropriate instructional cues and prompts to facilitate competent motor skill performance.	Teacher candidates are able to develop teaching cues and prompts, as evidenced by lesson plan contents. These cues will be sufficient to facilitate competent motor skill performance.
6.10 Develop a repertoire of direct and indirect instructional formats to facilitate student learning (e.g., ask questions, pose scenarios, promote problem solving and critical thinking, facilitate factual recall).	Teacher candidates demonstrate direct and indirect instructional formats to facilitate student learning (e.g., ask questions, pose scenarios, facilitate factual recall, promote problem solving and critical thinking,).

Physical Education Standard 7: Student Assessment

Physical education teachers understand and use assessment to foster physical, cognitive, social, and emotional development of students in physical activity.

Elements	Indicators
7.1 Identify key components of various types of assessment, describe their appropriate and inappropriate use, and address issues of validity, reliability, and bias.	Teacher candidates are able to identify key components of various types of assessment, describe their appropriate and inappropriate use, and address issues of validity, reliability, and bias.
7.2 Use a variety of appropriate authentic and traditional assessment techniques (including both self and peer assessments) to assess student understanding and performance, provide feedback, and communicate student progress (i.e., for both formative and summative purposes).	Teacher candidates use a variety of appropriate authentic and traditional assessment techniques to assess student performance, provide feedback, and communicate student progress (i.e., for both formative and summative purposes).
7.3 Interpret and use learning and performance data to make informed curricular and/or instructional decisions.	Teacher candidates involve students in self and peer assessment.
7.4 Interpret and use performance data to inform curricular and instructional decisions.	Teacher candidates interpret and use performance data to inform curricular and instructional decisions.

Physical Education Standard 8: Reflection Physical education teachers are reflective practitioners who evaluate the effects of their actions on others (e.g., students, parents/guardians, fellow professionals), and seek opportunities to grow professionally.	
Elements	**Indicators**
8.1 Use a reflective cycle involving description of teaching, justification of teaching performance, critique of the teaching performance, the setting of teaching goals, and implementation of change.	Teacher candidates demonstrate a sufficient ability to use a reflective cycle involving description of teaching, justification of the teaching performance, critique of the teaching performance, the setting of teaching goals, and implementation of change, as evidenced by lesson reflections and lesson modifications implemented in subsequent lessons of a comparable nature.
8.2 Use available resources (e.g., colleagues, literature, professional associations) to develop as a reflective professional.	Teacher candidates avail themselves of several resources such as colleagues, literature, and professional associations to develop as a reflective professional.
8.3 Construct a plan for continued professional growth based on the assessment of personal teaching performance.	Teacher candidates are able to effectively assess personal teaching performance and develop a professional development plan based on this data.
Physical Education Standard 9: Technology Physical education teachers use information technology to enhance learning and to enhance personal and professional productivity.	
Elements	**Indicators**
9.1 Demonstrate knowledge of current technologies and their application in physical education.	Teacher candidates possess an adequate knowledge of current technologies and are able to apply these technologies appropriately to physical education content and instruction.
9.2 Design, develop, and implement student learning activities that integrate information technology.	Teacher candidates are able to employ several types of information technology in the design, development, and implementation of student learning activities.
9.3 Use technologies to communicate, network, locate resources, and enhance continuing professional development.	Teacher candidates demonstrate a sufficient use of technologies to communicate, network, locate resources, and enhance continuing professional development.
Physical Education Standard 10: Collaboration Physical education teachers foster relationships with colleagues, parents/guardians, and community agencies to support students' growth and well-being.	
Elements	**Indicators**
10.1 Identify strategies to become an advocate in the school and community to promote a variety of physical activity opportunities.	Teacher candidates are able to identify several appropriate strategies necessary to become an advocate in the school and community. Teacher candidates demonstrate the ability to promote a moderate variety of physical activity opportunities.
10.2 Actively participate in the professional physical education community (e.g., local, state, district,	Teacher candidates participate in the professional physical education community at the local and/or state levels and demonstrate limited participation within the broader field of

national) and within the broader education field.	education.
10.3 Identify and actively seek community resources to enhance physical activity opportunities.	Teacher candidates can identify some community resources to enhance physical activity opportunities and seek to use them on a limited basis.
10.4 Pursue productive relationships with parents/guardians and school colleagues, to support student growth and well-being.	Teacher candidates are able to establish somewhat productive relationships with parents/guardians and school colleagues on a limited basis, to support student growth and well being.

Mathematics Elementary Level (1-6)

Institutions and Organizations seeking State Approval for programs that prepare and result in the recommendation for licensure as teachers of Elementary Mathematics Education shall be required to demonstrate that they meet the following program standards. The standards below are an adapted version of the 2003 Standards of the Association for Childhood Education International for the preparation of Elementary Mathematics Teachers.

Standard 1: Knowledge of Mathematical Problem Solving	
Description	**Indicators**
Candidates know, understand, and apply the process of mathematical problem solving.	Candidates are able to: • Apply and adapt a variety of appropriate strategies to solve problems. • Solve problems that arise in mathematics and those involving mathematics in other contexts. • Build new mathematical knowledge through problem solving. • Monitor and reflect on the process of mathematical problem solving.
Standard 2: Knowledge of Reasoning and Proof	
Description	**Indicators**
Candidates reason, construct, and evaluate mathematical arguments and develop an appreciation for mathematical rigor and inquiry.	Candidates are able to: • Recognize reasoning and proof as fundamental aspects of mathematics. • Make and investigate mathematical conjectures. • Develop and evaluate mathematical arguments and proofs. • Select and use various types of reasoning and methods of proof.
Standard 3: Knowledge of Mathematical Communication	
Description	**Indicators**
Candidates communicate their mathematical thinking orally and in writing to peers, faculty, and others.	Candidates are able to: • Communicate their mathematical thinking coherently and clearly to peers, faculty, and others. • Use the language of mathematics to express ideas precisely. • Organize mathematical thinking through communication. • Analyze and evaluate the mathematical thinking and strategies of others.
Standard 4: Knowledge of Mathematical Connections	
Description	**Indicators**
Candidates recognize, use, and make connections between and among mathematical ideas and in contexts outside mathematics to build mathematical understanding.	Candidates are able to: • Recognize and use connections among mathematical ideas. • Recognize and apply mathematics in contexts outside of mathematics. • Demonstrate how mathematical ideas interconnect and build on one another to produce a coherent whole.

Standard 5: Knowledge of Mathematical Representation	
Description	**Indicators**
Candidates use varied representations of mathematical ideas to support and deepen students' mathematical understanding.	Candidates are able to: • Use representations to model and interpret physical, social, and mathematical phenomena. • Create and use representations to organize, record, and communicate mathematical ideas. • Select, apply, and translate among mathematical representations to solve problems.
Standard 6: Knowledge of Technology	
Description	**Indicator**
Candidates embrace technology as an essential tool for teaching and learning mathematics.	Candidates are able to: • Use knowledge of mathematics to select and use appropriate technological tools, such as but not limited to, spreadsheets, dynamic graphing tools, computer algebra systems, dynamic statistical packages, graphing calculators, data-collection devices, and presentation software.
Standard 7: Dispositions	
Description	**Indicators**
Candidates support a positive disposition toward mathematical processes and mathematical learning.	Candidates are able to: • Pay attention to equity. • Use stimulating curricula. • Teach effectively. • Commit to learning with understanding. • Use various assessments. • Use various teaching tools including technology.
Standard 8: Knowledge of Mathematics Pedagogy	
Description	**Indicators**
Candidates possess a deep understanding of how students learn mathematics and of the pedagogical knowledge specific to mathematics teaching and learning.	The candidate: • Selects, uses, and determines suitability of the wide variety of available mathematics curricula and teaching materials for all students including those with special needs such as the gifted, challenged and speakers of other languages. • Selects and uses appropriate concrete materials for learning mathematics. • Uses multiple strategies, including listening to and understanding the ways students think about mathematics, to assess students' mathematical knowledge. • Plans lessons, units and courses that address appropriate learning goals, including those that address local, state, and national mathematics standards and legislative mandates. • Participates in professional mathematics organizations and uses their print and on-line resources. • Demonstrates knowledge of research results in the teaching and learning of mathematics. • Uses knowledge of different types of instructional strategies in planning mathematics lessons.

	• Demonstrates the ability to lead classes in mathematical problem solving and in developing in-depth conceptual understanding, and to help students develop and test generalizations. • Develop lessons that use technology's potential for building understanding of mathematical concepts and developing important mathematical ideas.
Standard 9: Knowledge of Number and Operation	
Description	**Indicators**
Candidates demonstrate computational proficiency, including a conceptual understanding of numbers, ways of representing number, relationships among number and number systems, and meanings of operations.	Candidates are able to: • Develop the meaning of addition, subtraction, multiplication, and division and provide multiple models for whole number operations and their applications. • Recognize the meaning and use of place value in representing whole numbers and finite decimals, comparing and ordering numbers, and understanding the relative magnitude of numbers. • Demonstrate proficiency in multi-digit computation using algorithms, mental mathematics, and computational estimation. • Analyze integers and rational numbers, their relative size, and how operations with whole numbers extend to integers and rational numbers. • Demonstrate knowledge of the historical development of number and number systems including contributions from diverse cultures.
Standard 10: Knowledge of Different Perspectives on Algebra	
Description	**Indicators**
Candidates emphasize relationships among quantities including functions, ways of representing mathematical relationships, and the analysis of change.	Candidates are able to: • Explore and analyze patterns, relations, and functions. • Recognize and analyze mathematical structures. • Investigate equality and equations. • Use mathematical models to represent quantitative relationships. • Analyze change in various contexts. • Demonstrate knowledge of the historical development of algebra including contributions from diverse cultures.
Standard 11: Knowledge of Geometries	
Description	**Indicators**
Candidates use spatial visualization and geometric modeling to explore and analyze geometric shapes, structures, and their properties.	Candidates are able to: • Use visualization, the properties of two- and three-dimensional shapes, and geometric modeling. • Build and manipulate representations of two- and three-dimensional objects using concrete models, drawings, and dynamic geometry software. • Specify locations and describe spatial relationships using coordinate geometry. • Apply transformations and use symmetry, congruence, and similarity. • Demonstrate knowledge of the historical development of Euclidean and non-Euclidean geometries including contributions from diverse cultures.

Standard 12: Knowledge of Data Analysis, Statistics, and Probability	
Description	**Indicators**
Candidates demonstrate an understanding of concepts and practices related to data analysis, statistics, and probability.	Candidates are able to: • Design investigations that can be addressed by creating data sets and collecting, organizing, and displaying relevant data. • Use appropriate statistical methods and technological tools to analyze data and describe shape, spread, and center. • Apply the basic concepts of probability. • Demonstrate knowledge of the historical development of probability and statistics including contributions from diverse cultures.

Standard 13: Knowledge of Measurement	
Description	**Indicators**
Candidates apply and use measurement concepts and tools.	Candidates are able to: • Recognize and apply measurable attributes of objects and the units, systems, and processes of measurement. • Employ estimation as a way of understanding measurement units and processes. • Demonstrate knowledge of the historical development of measurement and measurement systems including contributions from diverse cultures.

Standard 14: Field-Based Experiences	
Description	**Indicators**
Candidates complete field-based experiences in mathematics classrooms.	Candidates are able to: • Engage in a sequence of planned opportunities prior to student teaching that includes observing and participating in middle grades mathematics classrooms under the supervision of experienced and highly qualified teachers. • Experience full-time student teaching in elementary grades mathematics that is supervised by an experienced and highly qualified teacher and an organizational supervisor with elementary grades mathematics teaching experience. • Demonstrate the ability to increase students' knowledge of mathematics.

Mathematics Middle Level (4-8)

Institutions and Organizations seeking State Approval for programs that prepare and result in the recommendation for licensure as teachers of Middle-level Mathematics Education shall be required to demonstrate that they meet the following program standards. The standards below are an adapted version of the 2003 Standards of the National Council of Teachers of Mathematics for the preparation of Middle-level Mathematics Teachers.

Standard 1: Knowledge of Mathematical Problem Solving	
Description	**Indicators**
Candidates know, understand, and apply the process of mathematical problem solving.	Candidates are able to: • Apply and adapt a variety of appropriate strategies to solve problems. • Solve problems that arise in mathematics and those involving mathematics in other • contexts. • Build new mathematical knowledge through problem solving. • Monitor and reflect on the process of mathematical problem solving.
Standard 2: Knowledge of Reasoning and Proof	
Description	**Indicators**
Candidates reason, construct, and evaluate mathematical arguments and develop an appreciation for mathematical rigor and inquiry.	Candidates are able to: • Recognize reasoning and proof as fundamental aspects of mathematics. • Make and investigate mathematical conjectures. • Develop and evaluate mathematical arguments and proofs. • Select and use various types of reasoning and methods of proof.
Standard 3: Knowledge of Mathematical Communication	
Description	**Indicators**
Candidates communicate their mathematical thinking orally and in writing to peers, faculty, and others.	Candidates are able to: • Communicate their mathematical thinking coherently and clearly to peers, faculty, and others. • Use the language of mathematics to express ideas precisely. • Organize mathematical thinking through communication. • Analyze and evaluate the mathematical thinking and strategies of others.
Standard 4: Knowledge of Mathematical Connections	
Description	**Indicators**
Candidates recognize, use, and make connections between and among mathematical ideas and in contexts outside mathematics to build mathematical understanding.	Candidates are able to: • Recognize and use connections among mathematical ideas. • Recognize and apply mathematics in contexts outside of mathematics. • Demonstrate how mathematical ideas interconnect and build on one another to produce a coherent whole.

Standard 5: Knowledge of Mathematical Representation	
Description	**Indicators**
Candidates use varied representations of mathematical ideas to support and deepen students' mathematical understanding.	Candidates are able to: • Use representations to model and interpret physical, social, and mathematical phenomena. • Create and use representations to organize, record, and communicate mathematical ideas. • Select, apply, and translate among mathematical representations to solve problems.
Standard 6: Knowledge of Technology	
Description	**Indicator**
Candidates embrace technology as an essential tool for teaching and learning mathematics.	Candidates are able to: • Use knowledge of mathematics to select and use appropriate technological tools, such as but not limited to, spreadsheets, dynamic graphing tools, computer algebra systems, dynamic statistical packages, graphing calculators, data-collection devices, and presentation software.
Standard 7: Dispositions	
Description	**Indicators**
Candidates support a positive disposition toward mathematical processes and mathematical learning.	Candidates are able to: • Pay attention to equity. • Use stimulating curricula. • Teach effectively. • Commit to learning with understanding. • Use various assessments. • Use various teaching tools including technology.
Standard 8: Knowledge of Mathematics Pedagogy	
Description	**Indicators**
Candidates possess a deep understanding of how students learn mathematics and of the pedagogical knowledge specific to mathematics teaching and learning.	Candidates are able to: • Selects, uses, and determines suitability of the wide variety of available mathematics curricula and teaching materials for all students including those with special needs such as the gifted, challenged and speakers of other languages. • Selects and uses appropriate concrete materials for learning mathematics. • Uses multiple strategies, including listening to and understanding the ways students think about mathematics, to assess students' mathematical knowledge. • Plans lessons, units and courses that address appropriate learning goals, including those that address local, state, and national mathematics standards and legislative mandates. • Participates in professional mathematics organizations and uses their print and on-line resources. • Demonstrates knowledge of research results in the teaching and learning of mathematics.

	• Uses knowledge of different types of instructional strategies in planning mathematics lessons. • Demonstrates the ability to lead classes in mathematical problem solving and in developing in-depth conceptual understanding, and to help students develop and test generalizations. • Develop lessons that use technology's potential for building understanding of mathematical concepts and developing important mathematical ideas.
Standard 9: Knowledge of Number and Operation	
Description	**Indicators**
Candidates demonstrate computational proficiency, including a conceptual understanding of numbers, ways of representing number, relationships among number and number systems, and meanings of operations.	Candidates are able to: • Develop the mathematics that underlies the procedures used for operations involving whole numbers, integers, and rational numbers. • Use properties involving number and operations, mental computation, and computational estimation. • Provide equivalent representations of fractions, decimals, and percents. • Create, solve, and apply proportions. • Apply the fundamental ideas of number theory. • Make sense of large and small numbers and use scientific notation. • Analyze and explain the distinctions among whole numbers, integers, rational numbers, and real numbers and whether or not the field axioms hold. • Demonstrate knowledge of the historical development of number and number systems including contributions from diverse cultures.
Standard 10: Knowledge of Different Perspectives on Algebra	
Description	**Indicators**
Candidates emphasize relationships among quantities including functions, ways of representing mathematical relationships, and the analysis of change.	Candidates are able to: • Explore, analyze, and represent patterns, relations, and functions. • Represent and analyze mathematical structures. • Investigate equality, equations, and proportional relationships. • Use mathematical models to represent quantitative relationships. • Analyze change in various contexts. • Demonstrate knowledge of the historical development of algebra including contributions from diverse cultures.
Standard 11: Knowledge of Geometries	
Description	**Indicators**
Candidates use spatial visualization and geometric modeling to explore and analyze geometric shapes, structures, and their properties.	Candidates are able to: • Demonstrate knowledge of core concepts and principles of Euclidean and non-Euclidean geometries in two and three dimensions from both formal and informal perspectives.

	• Exhibit knowledge of the role of axiomatic systems and proofs in geometry. • Analyze characteristics and relationships of geometric shapes and structures. • Build and manipulate representations of two- and three-dimensional objects and visualize objects from different perspectives. • Specify locations and describe spatial relationships using coordinate geometry, vectors, and other representational systems. • Apply transformations and use symmetry, similarity, and congruence to analyze mathematical situations. • Use concrete models, drawings, and dynamic geometric software to explore geometric ideas and their applications in real-world contexts. • Demonstrate knowledge of the historical development of Euclidean and non-Euclidean geometries including contributions from diverse cultures.
Standard 12: Knowledge of Calculus	
Description	**Indicators**
Candidates demonstrate a conceptual understanding of limit, continuity, differentiation, and integration and a thorough background in the techniques and application of the calculus.	Candidates are able to: • Demonstrate a conceptual understanding of basic calculus concepts. • Demonstrate knowledge of the historical development of calculus including contributions from diverse cultures.
Standard 13: Knowledge of Discrete Mathematics	
Description	**Indicators**
Candidates apply the fundamental ideas of discrete mathematics in the formulation and solution of problems.	Candidates are able to: • Demonstrate a conceptual understanding of the fundamental ideas of discrete mathematics • Use technological tools to apply the fundamental concepts of discrete mathematics. • Demonstrate knowledge of the historical development of discrete mathematics including contributions from diverse cultures.
Standard 14: Knowledge of Data Analysis, Statistics, and Probability	
Description	**Indicators**
Candidates demonstrate an understanding of concepts and practices related to data analysis, statistics, and probability.	Candidates are able to: • Design investigations, collect data through random sampling or random assignment to treatments, and use a variety of ways to display the data and interpret data representations. • Draw conclusions involving uncertainty by using hands-on and computer-based simulation for estimating probabilities and gathering data to make inferences and decisions. • Identify misuses of statistics and invalid conclusions from probability. • Use appropriate statistical methods and technological tools to analyze data and describe shape, spread, and center.

	• Investigate, interpret, and construct representations for conditional probability, geometric probability, and for bivariate data. • Demonstrate knowledge of the historical development of probability and statistics including contributions from diverse cultures.
Standard 15: Knowledge of Measurement	
Description	**Indicators**
Candidates apply and use measurement concepts and tools.	Candidates are able to: • Recognize measurement attributes and their effect on the choice of appropriate tools and units. • Apply techniques, tools, and formulas to determine measurements. • Employ estimation as a way of understanding measurement units and processes. • Completes error analysis through determining the reliability of the numbers obtained from measurement. • Demonstrate knowledge of the historical development of measurement and measurement systems including contributions from diverse cultures.
Standard 16: Field-Based Experiences	
Description	**Indicators**
Candidates complete field-based experiences in mathematics classrooms.	Candidates are able to: • Engage in a sequence of planned opportunities prior to student teaching that includes observing and participating in middle grades mathematics classrooms under the supervision of experienced and highly qualified teachers. • Experience full-time student teaching in middle grades mathematics that is supervised by an experienced and highly qualified teacher and a university or college supervisor with middle grades mathematics teaching experience. • Demonstrate the ability to increase students' knowledge of mathematics.

Modern Foreign Language

Institutions and Organizations seeking State Approval for programs that prepare and result in the recommendation of candidates for licensure as teachers of Modern Foreign Languages shall be required to demonstrate that they meet the following program standards. The standards below are an adapted version of the 2002 Standards of the American Council on the Teaching of Foreign Languages (ACTFL) for the preparation of Foreign Language Teachers.

Standard 1: Language, Linguistics, Comparisons	
Elements	**Indicators**
Standard 1.a. Demonstrating Language Proficiency Candidates demonstrate a high level of proficiency in the target language, and they seek opportunities to strengthen their proficiency.	• For French, German, Hebrew, Italian, Portuguese, Russian, and Spanish, candidates speak at the Advanced-Low level on the ACTFL scale: they participate actively in most informal and some formal conversations dealing with topics related to school, home, and leisure activities, and to a lesser degree, those related to events of work current, public, and personal interest; they narrate and describe in present, past, and future time frames, but control of aspect may be lacking at times; they combine and link sentences into connected discourse of paragraph length; they handle appropriately a routine situation or familiar communicative task that presents a complication or unexpected turn of events; they are understood by native speakers unaccustomed to dealing with non-natives, even though this may be achieved only through repetition and restatement. • For Arabic, Chinese, Japanese, and Korean, candidates speak at the Intermediate-High level on the ACTFL scale: they handle successfully uncomplicated tasks and social situations requiring an exchange of basic information related to work, school, recreation, and particular interests, though hesitation and errors may be evident; they handle the tasks pertaining to the Advanced level, but their performance of these tasks will exhibit one or more features of breakdown such as the failure to maintain the narration or description syntactically in the appropriate time frame, the disintegration of connected discourse, the misuse of cohesive devices, a reduction in vocabulary, or a significant amount of hesitation; they are generally understood by native speakers unaccustomed to dealing with non-natives, although gaps in communication may occur. • As listeners, candidates move beyond literal comprehension, infer the meaning of unfamiliar words and phrases in new contexts, infer and interpret the author's intent, and offer a personal interpretation of the message. • For readers of target languages that use a Roman alphabet, including classical languages, candidates move beyond literal comprehension, infer the meaning of unfamiliar words and phrases in new contexts, infer and interpret the author's intent, and offer a personal interpretation of text. • For readers of target languages that use a non-Roman alphabet or characters, candidates identify main ideas and most important details, begin to move beyond literal comprehension, and identify either the author's perspective(s) or cultural perspective(s).

	• Candidates deliver oral presentations extemporaneously, without reading notes verbatim. Presentations consist of familiar literary and cultural topics and those of personal interest. They speak in connected discourse using a variety of time frames and vocabulary appropriate to the topic. They use extra-linguistic support as needed to facilitate audience comprehension (e.g., visuals). • For target languages that use the Roman alphabet, candidates write at the Advanced-Low level on the ACTFL scale: they write routine social correspondence, they write about familiar topics by means of narratives, descriptions and summaries of a factual nature in major time frames with some control of aspect; they combine sentences in texts of paragraph length; they incorporate a limited number of cohesive devices; their writing demonstrates control of simple target-language sentence structures and partial control of more complex structures syntactic structures; their writing is understood by readers accustomed to the writing of second language learners although additional effort may be required in reading the text. For target languages that a non-Roman alphabet or characters, candidates write at the Intermediate-High level on the ACTFL scale: they meet all practical writing needs (uncomplicated letters, simple summaries, compositions related to work, school, and topics of current and general interest); they connect sentences into paragraphs using a limited number of cohesive devices that tend to be repeated; they write simple descriptions and narrations of paragraph length on everyday events and situations in different time frames, although with some inaccuracies; their writing is generally comprehensible to natives not used to the writing of non-natives, but gaps in comprehension may occur. • Candidates maintain and enhance their proficiency by interacting in the target language outside of the classroom, reading, and using technology to access target language communities.
Standard 1.b. Understanding Linguistics Candidates know the linguistic elements of the target language system, recognize the changing nature of language, and accommodate for gaps in their own knowledge of the target language system by learning on their own.	• Candidates identify phonemes and allophones of the target language. They understand the rules of the sound system of the target language. They diagnose their own target language pronunciation difficulties. • Candidates identify morphemes (affixes and stems) in the target language and describe how they are put together to form words. They recognize the meaning of new words by using morphological clues (e.g., word families). • Candidates describe syntactic patterns of the target language, such as formation of simple sentences and questions, and contrast them with those of their native languages. Candidates recognize key cohesive devices used in connected discourse (e.g., conjunctions, adverbs). • Candidates understand the inferred meaning of words and sentences as well as high-frequency idiomatic expressions. Candidates understand and identify semantic differences between their native languages and the target language. • Candidates explain the rules that govern the formation of words and sentences such as those pertaining to the verbal system, agreement, use of pronouns, prepositions and postpositions, word order, and interrogatives in terms of regularities and irregularities. They exemplify these rules with target language examples.

	• Candidates identify the pragmatic and sociolinguistic features (e.g., politeness conventions, formal/informal forms of address) of target language discourse. They identify target language features for creating coherence in extended spoken and printed texts. • Candidates identify key changes in the target language that have occurred over time (such as writing system, introduction of new words, spelling conventions, grammatical elements, etc.). They identify discrepancies that may exist between the target language of their instructional materials and contemporary usage. • Candidates investigate the target language system and examples on their own when faced with specific aspects of the system with which they are not familiar.
Standard 1.c. Identifying Language Comparisons Candidates know the similarities and differences between the target language and other languages, identify the key differences in varieties of the target language, and seek opportunities to learn about varieties of the target language on their own.	• Candidates identify key differences between the target and other languages and include this information in language instruction. • Candidates identify key features of varieties of the target language in terms of gender and dialectal differences and provide examples to students. • Candidates learn about target language varieties through interaction with native speakers outside of class and by accessing authentic target language samples through a variety of means such as technology.
Standard 2: Cultures, Literatures, Cross-Disciplinary Concepts	
Elements	**Indicators**
Standard 2.a. Demonstrating Cultural Understandings Candidates demonstrate that they understand the connections among the perspectives of a culture and its practices and products, and they integrate the cultural framework for foreign language standards into their instructional practices.	• Candidates cite key cultural perspectives and provide support through description of products and practices. • Candidates have spent planned time in a target culture or community so that they have personal experience to support academic study. • Candidates demonstrate that they can analyze and hypothesize about unfamiliar or unknown cultural issues. They use the framework of the foreign language standards or another cultural model to investigate hypotheses that arise from materials or events that contain cultural questions or assumptions. • Candidates use the standards framework or other cultural model to integrate culture into daily lessons and units of instruction. They engage students in exploring the products and practices that relate to specific perspectives of the target culture. • Candidates integrate cultural insights with the target language in its communicative functions and content areas. They work to extend their knowledge of culture through independent work and interactions with native speakers.
Standard 2.b. Demonstrating Understanding of Literary and Cultural Texts and Traditions Candidates recognize the value and role of literary and cultural texts and use them to interpret	• Candidates interpret literary texts that represent defining works in the target cultures. They identify themes, authors, historical style, and text types in a variety of media that the cultures deem important in understanding the traditions of the cultures. • Candidates select literary and cultural texts appropriate to age, interests, and proficiency level of their students. They integrate these texts into lessons, design activities that develop language competencies based on

and reflect upon the perspectives of the target cultures over time.	these texts, and engage students in interpreting their meaning and the cultural perspectives that they represent. • Candidates identify from their studies lists of texts they plan to use and adapt in their teaching. They enrich classroom content with texts and topics valued by the culture. These texts are taken from literature and other media.
Standard 2.c. Integrating Other Disciplines In Instruction Candidates integrate knowledge of other disciplines into foreign language instruction and identify distinctive viewpoints accessible only through the target language.	• Candidates integrate concepts from other subject areas such as math, science, social studies, art, and music. They teach students strategies for learning this new content in the foreign language. • Candidates collaborate with colleagues in making connections between language and other subject areas. They locate authentic resources appropriate to the age, grade level, program goals, and interests of their students. • Candidates devote time to finding ways to integrate subject-area content and to locating authentic resources. They are willing to learn new content with students.
Standard 3: Language Acquisition Theories and Instructional Practices	
Elements	**Indicators**
Standard 3.a. Understanding Language Acquisition and Creating a Supportive Classroom Candidates demonstrate an understanding of language acquisition at various developmental levels and use this knowledge to create a supportive classroom learning environment that includes target language input and opportunities for negotiation of meaning and meaningful interaction.	• Candidates exhibit an understanding of language acquisition theories, including the use of target language input, negotiation of meaning, interaction, and a supportive learning environment. They draw on their knowledge of theories, as they apply to K-12 learners at various developmental levels, in designing teaching strategies that facilitate language acquisition. • Candidates use the target language to the maximum extent in classes at all levels of instruction. They designate certain times for spontaneous interaction with students in the target language. They tailor language use to students' developing proficiency levels. They use a variety of strategies to help students understand oral and written input. They use the target language to design content-based language lessons. • Candidates negotiate meaning with students when spontaneous interaction occurs. They teach students a variety of ways to negotiate meaning with others and provide opportunities for them to do so in classroom activities. • Candidates design activities in which students will have opportunities to interact meaningfully with one another. The majority of activities and tasks are standards-based and have meaningful contexts that reflect curricular themes and students' interests. • Candidates employ exercises and activities that require students to provide open-ended, personalized responses. • Candidates often assume the role of facilitator in classroom activities. Some activities provide opportunities for them to learn with their students. • Candidates provide feedback to students that focuses on meaning as well as linguistic accuracy. They view errors as a normal part of the language acquisition process. • Candidates employ strategies to encourage and affirm student progress. Candidates encourage students to take risks in using the target language.

Standard 3.b. Developing Instructional Practices that Reflect Language Outcomes and Learner Diversity Candidates develop a variety of instructional practices that reflect language outcomes and articulated program models and address the needs of diverse language learners.	• Candidates describe the physical, cognitive, emotional, and social developmental characteristics of K-12 students. They implement a variety of instructional models and techniques to accommodate these differences. • Candidates describe how foreign language program models (e.g., FLES, FLEX, immersion) lead to different language outcomes. • Candidates seek out information regarding their students' language levels, language backgrounds, and learning styles. They implement a variety of instructional models and techniques to address these student differences. • Candidates identify multiple ways in which students learn when engaged in language classroom activities. • Candidates implement a variety of instructional models and techniques that address specific special needs of their students. • Candidates implement activities that promote critical thinking and problem-solving skills. • Candidates recognize that questioning strategies and task-based activities serve different instructional objectives. They use tasks as they appear in their instructional materials. • Candidates seek out opportunities to learn about their students, their backgrounds, and their special needs. They adapt instruction to address students' needs.
STANDARD 4: Integration Of Standards Into Curriculum and Instruction	
Elements	**Indicators**
Standard 4.a. Understanding and Integrating Standards In Planning Candidates demonstrate an understanding of the goal areas and standards of the *Standards for Foreign Language Learning* and their state standards, and they integrate these frameworks into curricular planning.	• Candidates describe how the goal areas and standards (both national and state) are addressed in instructional materials and/or classroom activities. • Candidates create unit/lesson plan objectives that address specific goal areas and standards (national and state). They design activities and/or adapt instructional materials and activities to address specific standards. • Candidates integrate national and state standards into their curricular planning, even if their instructional materials are not standards-based.
Standard 4.b. Integrating Standards in Instruction Candidates integrate the *Standards for Foreign Language Learning* and their state standards into language instruction.	• Candidates adapt exercises and activities as necessary to address specific goal areas and standards of the *Standards for Foreign Language Learning* and their state standards. • Candidates design opportunities for their students to communicate by using the interpersonal, interpretive, and presentational modes in an integrated manner. • Candidates design opportunities for their students to explore the target language culture(s) by means of cultural products, practices, and perspectives. • Candidates plan for and design opportunities for their students to learn about other subject areas in the foreign language. They obtain information about other subject areas from colleagues who teach those subjects.

	• Candidates provide opportunities for their students to connect to target language communities through a variety of means such as technology and authentic materials. • Candidates design and implement activities that are standards based, even if their instructional materials and curriculum are not standards based. They acquire knowledge and skills to be able to do this.
Standard 4.c. Selecting and Designing Instructional Materials Candidates use standards and curricular goals to evaluate, select, design, and adapt instructional resources.	• Candidates use their knowledge of standards and curricular goals to evaluate, select, and design materials, including visuals, realia, authentic printed and oral materials, and other resources obtained through technology. • Candidates identify and integrate authentic materials into classroom activities (e.g., tape recorded news broadcasts and talk shows, magazine and newspaper articles, literary selections, videotaped talk shows, realia). They help students to acquire strategies for understanding and interpreting authentic texts. • Candidates adapt materials as necessary to reflect standards-based goals and instruction when materials fall short. • Candidates locate additional resources that enhance topics/themes in the curriculum.
STANDARD 5: Assessment Of Languages and Cultures	
Elements	**Indicators**
Standard 5.a. Knowing Assessment Models and Using Them Appropriately Candidates believe that assessment is ongoing, and they demonstrate knowledge of multiple ways of assessment that are age- and level-appropriate by implementing purposeful measures.	• Candidates design formative assessments to measure achievement within a unit of instruction and summative assessments to measure achievement at the end of a unit or chapter. • Candidates design performance assessments that measure students' abilities to comprehend and interpret authentic oral and written texts from the target cultures. The assessments they design and use encompass a variety of response types from forced choice to open-ended. • Candidates design performance assessments that measure students' abilities to negotiate meaning as listeners/speakers and as readers/writers in an interactive mode. Assessments focus on tasks at students' levels of comfort but pose some challenges. • Candidates design and use assessments that capture how well student speak and write in planned contexts. The assessments focus on the final products created after a drafting process and look at how meaning is conveyed in culturally appropriate ways. They create and use effective holistic and/or analytical scoring methods. • Candidates devise assessments that allow students to apply the cultural framework to authentic documents. Student tasks include identifying the products, practices, and perspectives embedded in those documents. • Candidates utilize existing standards-based performance assessments (e.g., integrated performance assessments), that allow students to work through a series of communicative tasks on a particular theme (e.g., wellness, travel). They are able to evaluate performance in a global manner. • Candidates assess what students know and are able to do by using and designing assessments that capture successful communication and cultural understandings. They commit the effort necessary to measure end performances.

Standard 5.b. Reflecting on Assessment Candidates reflect on the results of student assessments, adjust instruction accordingly, analyze the results of assessments, and use success and failure to determine the direction of instruction.	• Candidates observe and analyze the results of student performances so as to discern both global success and underlying inaccuracies. • Candidates use insights gained from assessing student performances to adapt, change, and reinforce instruction. • Candidates incorporate what they have learned from assessments and show how they have adjusted instruction. The commitment to do this is established in their planning.
Standard 5.c. Reporting assessment results Candidates interpret and report the results of student performances to all stakeholders and provide opportunity for discussion.	• Candidates interpret and report accurately the progress students are making in terms of language proficiency and cultural knowledge. They use the performances to illustrate both what students can do and how they can advance. • Candidates report student progress to students and parents. They use appropriate terminology and share examples that illustrate student learning. • Candidates report assessment results accurately and clearly.
Standard 6: Professionalism	
Elements	**Indicators**
Standard 6.a. Engaging in Professional Development Candidates engage in professional development opportunities that strengthen their own linguistic and cultural competence and promote reflection on practice.	• Candidates identify and participate in at least one professional organization. • Candidates identify immediate professional development needs. • Candidates frame their own reflection and research questions and show evidence of engaging in a reflective process to improve teaching and learning. • Candidates seek opportunities for professional growth.
Standard 6.b. Knowing the Value of Foreign Language Learning Candidates know the value of foreign language learning to the overall success of all students and understand that they will need to become advocates with students, colleagues, and members of the community to promote the field.	• Candidates develop a rationale that includes key benefits of foreign language learning. • Candidates choose appropriate data sources to develop products in support of foreign language learning for designated audiences. • Candidates provide evidence of the importance of building alliances to advocate for K-12 foreign language learning. • Based on readings and field experiences, candidates believe that all students should have opportunities to learn a foreign language.

Music Education (Vocal or Instrumental)

Institutions and Organizations seeking State Approval for programs that prepare and result in the recommendation of candidates for licensure as Music teachers shall be required to demonstrate that they meet the following program standards. The standards below are an adapted version of the 2007 Standards of National Association of Schools of Music for the preparation of Music Teachers.

Standard 1: Desirable Attributes

Indicators

Candidates should demonstrate:

- Personal commitment to the art of music, to teaching music as an element of civilization, and to encouraging the artistic and intellectual development of students, plus the ability to fulfill these commitments as an independent professional.
- The ability to lead students to an understanding of music as an art form, as a means of communication, and as a part of their intellectual and cultural heritage.
- The capability to inspire others and to excite the imagination of students, engendering a respect for music and a desire for musical knowledge and experiences.
- The ability to articulate logical rationales for music as a basic component of general education, and to present the goals and objectives of a music program effectively to parents, professional colleagues, and administrators.
- The ability to work productively within specific education systems, promote scheduling patterns that optimize music instruction, maintain positive relationships with individuals of various social and ethnic groups, and be empathetic with students and colleagues of differing backgrounds.
- The ability to evaluate ideas, methods, and policies in the arts, the humanities, and in arts education for their impact on the musical and cultural development of students.
- The ability and desire to remain current with developments in the art of music and in teaching, to make independent, in-depth evaluations of their relevance, and to use the results to improve musicianship and teaching skills.

Standard 2: Music Competencies

Indicators

The profession of school music teacher now encompasses a wide range of traditional, emerging, and experimental purposes, approaches, content, and methods. Each institution makes choices about what, among many possibilities it will offer prospective specialist music teachers. Institutions may offer a comprehensive curriculum involving two or more specializations and/or focus on one or more particular specializations.

The following standards provide a framework for developing and evaluating a wide variety of teacher preparation program goals and achievements. The following competencies apply to the preparation of music teachers:

(1) Conducting and Musical Leadership

A candidate must demonstrate that he/she is a competent conductor, able to create accurate and musically expressive performances with various types of performing groups and in general classroom situations. Instruction in conducting includes score reading and the integration of analysis, style, performance practices, instrumentation, and conducting techniques. Laboratory experiences that give the student opportunities to apply rehearsal techniques and procedures are essential. Prospective teachers in programs with less focus on the preparation of ensemble conductors must acquire conducting and musical leadership skills sufficient to teach effectively in their area(s) of specialization.

(2) Arranging
The candidate must be able to arrange and adapt music from a variety of sources to meet the needs and ability levels of individuals, school performing groups, and in classroom situations.

(3) Functional Performance
In addition to the skills required for all musicians, functional performance abilities in keyboard and the voice are essential. Functional performance abilities in instruments appropriate to the student's teaching specialization are also essential.

(4) Analysis/History/Literature
The prospective music teacher should be able to apply analytical and historical knowledge to curriculum development, lesson planning, and daily classroom and performance activities. Teachers should be prepared to relate their understanding of music with respect to styles, literature, multiple cultural sources, and historical development, both in general and as related to their area(s) of specialization.

Standard 3: Specialization Competencies

Description

Institutions and other educational authorities make decisions about the extent to which music teachers will be prepared in one or more specializations. The following competencies apply singly or in combination consistent with the specialization objectives of each teacher preparation program in music.

(1) General Music
Listed below are essential competencies and experiences for the general music teaching specialization:
- Musicianship, vocal, and pedagogical skills sufficient to teach general music.
- Knowledge of content, methodologies, philosophies, materials, technologies, and curriculum development for general music.
- The ability to lead performance-based instruction.
- Laboratory and field experiences in teaching general music.

(2) Vocal/Choral Music
Listed below are essential competencies and experiences for the vocal/choral teaching specialization:
- Vocal and pedagogical skill sufficient to teach effective use of the voice.
- Knowledge of content, methodologies, philosophies, materials, technologies, and curriculum development for vocal/choral music.
- Experiences in solo vocal performance, as well as in both large and small choral ensembles.
- Performance ability sufficient to use at least one instrument as a teaching tool and to provide, transpose, and improvise accompaniments.
- Laboratory experience in teaching beginning vocal techniques individually, in small groups, and in larger classes.

(3) Instrumental Music
Listed below are essential competencies and experiences for the instrumental music teaching specialization:
- Knowledge of and performance ability on wind, string, and percussion instruments sufficient to teach beginning students effectively in groups.
- Knowledge of content, methodologies, philosophies, materials, technologies, and curriculum development for instrumental music.
- Experiences in solo instrumental performance, as well as in both small and large instrumental ensembles.
- Laboratory experience in teaching beginning instrumental students individually, in small groups, and in larger classes.

(4) Specific Music Fields or Combinations

Listed below are essential competencies and experiences for music teaching specialization(s) focused on either one or a combination of areas such as composition, electronic and computer music, ethnic music, guitar, small ensembles, jazz, keyboard, orchestral music, music history and theory, music in combination with other disciplines, music technologies, and popular music; or combinations of one or more of these types of content with aspects of the general, vocal/choral, or instrumental specializations:

- Knowledge and skill in the selected area(s) of specialization sufficient to teach beginning and intermediate students effectively.
- Knowledge of content, methodologies, philosophies, materials, technologies, and curriculum development for the area(s) of specialization.
- In-depth experiences with the creative and/or performance and/or scholarly aspects of the selected area of specialization as required by the nature and content of that specialization.
- The ability to use instruments, equipment, and technologies associated with the area(s) of specialization.
- Laboratory experience in teaching beginning students in the area(s) of specialization, individually, in small groups, and in larger classes.

Standard 4: Teaching Competencies

Indicators

The musician-teacher must be able to lead students to competency, apply music knowledge and skills in teaching situations, and integrate music instruction into the process of P–12 education. Essential competencies are:

- Ability to teach music at various levels to different age groups and in a variety of classroom and ensemble settings in ways that develop knowledge of how music works syntactically as a communication medium and developmentally as an agent of civilization. This set of abilities includes effective classroom and rehearsal management.
- An understanding of child growth and development and an understanding of principles of learning as they relate to music.
- The ability to assess aptitudes, experiential backgrounds, orientations of individuals and groups of students, and the nature of subject matter, and to plan educational programs to meet assessed needs.
- Knowledge of current methods, materials, and repertories available in various fields and levels of music education appropriate to the teaching specialization.
- The ability to accept, amend, or reject methods and materials based on personal assessment of specific teaching situations.
- An understanding of evaluative techniques and ability to apply them in assessing both the musical progress of students and the objectives and procedures of the curriculum.

Physics

Institutions and Organizations seeking State Approval for programs that prepare and result in the recommendation of candidates for licensure as Physics Teachers shall be required to demonstrate that they meet the following program standards. The standards below are an adapted version of the 2003 Standards of the National Science Teachers Association (NSTA) for the preparation of Science Teachers.

Standard 1: Content Knowledge

Teachers of science understand and can articulate the knowledge and practices of contemporary science. They can interrelate and interpret important concepts, ideas, and applications in their fields of licensure; and can conduct scientific investigations.

Elements

To show that they are prepared in content, teachers of physics must demonstrate that they:

a. Understand and can successfully convey to students the major concepts, principles, theories, laws, and interrelationships of their fields of licensure and supporting fields as recommended by the National Science Teachers Association.
b. Understand and can successfully convey to students the unifying concepts of science delineated by the National Science Education Standards.
c. Understand and can successfully convey to students important personal and technological applications of science in their fields of licensure.
d. Understand research and can successfully design, conduct, report and evaluate investigations in science.
e. Understand and can successfully use mathematics to process and report data, and solve problems, in their field(s) of licensure.

Indicators

All secondary teachers should also be prepared to lead students to understand the <u>unifying concepts of science</u> including:

- Multiple ways we organize our perceptions of the world and how systems organize the studies and knowledge of science.
- Nature of scientific evidence and the use of models for explanation.
- Measurement as a way of knowing and organizing observations of constancy and change.
- Evolution of natural systems and factors that result in evolution or equilibrium.
- Interrelationships of form, function, and behaviors in living and nonliving systems.

All teachers of physics should be prepared lead students to understand the unifying concepts required of all teachers of science, and should in addition be prepared to lead students to understand:

- Energy, work, and power.
- Motion, major forces, and momentum.
- Newtonian principles and laws including engineering applications.
- Conservation of mass, momentum, energy, and charge.
- Physical properties of matter.
- Kinetic-molecular motion and atomic models.
- Radioactivity, nuclear reactors, fission, and fusion.
- Wave theory, sound, light, the electromagnetic spectrum and optics.
- Electricity and magnetism
- Fundamental processes of investigating in physics.
- Applications of physics in environmental quality and to personal and community health.

In addition to the core competencies, teachers of physics as a primary field should be prepared to effectively lead students to understand:

- Thermodynamics and relationships between energy and matter.
- Nuclear physics including matter-energy duality and reactivity.
- Angular rotation and momentum, centripetal forces, and vector analysis.
- Quantum mechanics, space-time relationships, and special relativity.
- Models of nuclear and subatomic structures and behavior.
- Light behavior, including wave-particle duality and models.
- Electrical phenomena including electric fields, vector analysis, energy, potential, capacitance, and inductance.
- Issues related to physics such as disposal of nuclear waste, light pollution, shielding communication systems and weapons development.
- Historical development and cosmological perspectives in physics including contributions of significant figures and underrepresented groups, and evolution of theories in physics.
- How to design, conduct, and report research in physics.
- Applications of physics and engineering in society, business, industry, and health fields.

All teachers of physics should be prepared to effectively apply concepts from other sciences and mathematics to the teaching of physics including concepts of:

- Biology, including organization of life, bioenergetics, biomechanics, and cycles of matter.
- Chemistry, including organization of matter and energy, electrochemistry, thermodynamics, and bonding.
- Earth sciences or astronomy related to structure of the universe, energy, and interactions of matter.
- Mathematical and statistical concepts and skills including statistics and the use of differential equations and calculus.

Standard 2: Nature of Science

Teachers of science engage students effectively in studies of the history, philosophy, and practice of science. They enable students to distinguish science from non-science, understand the evolution and practice of science as a human endeavor, and critically analyze assertions made in the name of science.

Elements

To show they are prepared to teach the nature of science, teachers of science must demonstrate that they:

a. Understand the historical and cultural development of science and the evolution of knowledge in their discipline.
b. Understand the philosophical tenets, assumptions, goals, and values that distinguish science from technology and from other ways of knowing the world.
c. Engage students successfully in studies of the nature of science including, when possible, the critical analysis of false or doubtful assertions made in the name of science.

Indicators

All students of science, whether teacher candidates or not, should have knowledge of the nature of science as defined in this standard, and should have the skills needed to engage students in the critical analysis of scientific and pseudoscientific claims in an appropriate way. This requires explicit attention to the nature of science, as defined in this standard, as a part of the preparation of science teachers.

Candidates should:

- Have multiple opportunities to study and analyze literature related to the history and nature of science, such as The Demon Haunted World (Sagan, 1996); Great Feuds in Science (Hellman, 1998) Facts, Fraud and Fantasy (Goran, 1979) and The Structure of Scientific Revolutions (Kuhn, 1962).
- Be required to analyze, discuss and debate topics and reports in the media related to the nature of science and scientific knowledge in courses and seminars throughout the program, not just in an educational context. Students should engage in active investigation and analysis of the conventions of science as reflected in papers and reports in science, across fields, in order to understand similarities and differences in methods and

interpretations in science, and to identify strengths and weaknesses of findings.

- Demonstrate that they are effective by successfully engaging students in the study of the nature of science. Assessments with regard to understanding may include such possibilities as completion of independent study courses, seminars or assignments; projects; papers; summative readings; or case study analyses. Assessments of effectiveness must include at least some demonstrably positive student outcomes in studies related to the nature of science as delineated by the standards in this cluster.

Standard 3: Inquiry

Teachers of science engage students both in studies of various methods of scientific inquiry and in active learning through scientific inquiry. They encourage students, individually and collaboratively, to observe, ask questions, design inquiries, and collect and interpret data in order to develop concepts and relationships from empirical experiences.

Elements

To show that they are prepared to teach through inquiry, teachers of science must demonstrate that they:

a. Understand the processes, tenets, and assumptions of multiple methods of inquiry leading to scientific knowledge.
b. Engage students successfully in developmentally appropriate inquiries that require them to develop concepts and relationships from their observations, data, and inferences in a scientific manner.

Indicators

- Candidates in a science teacher preparation program should be provided with multiple opportunities to solve open-ended problems using appropriate scientific methods. These opportunities should be present in their science content courses, but also should be fundamental in their science methods preparation. Many candidates enter teaching because they want to impart knowledge: It is not easy for them to lead students by listening and questioning, and to allow students to infer proposed solutions to problems. Practice is essential.
- The preparation of teachers for the elementary level, especially generalists, should require inquiry-based university science courses. Stalheim-Smith and Scharmann (1996) and Stoddart, Connell, Stofflett and Peck (1993) found that the use of constructivist teaching methodologies and learning cycles, methods that are generally inquiry-based, improved the learning of science by candidates in elementary education. Such courses also may increase the confidence level of generalists, who are often not confident in their ability to do science.
- Secondary programs should also strongly emphasize inquiry and pay close attention to preparing teachers to effectively lead students in such activities. All programs should provide explicit instruction in the nature of inquiry as well as its applications. Like the nature of science, inquiry is not learned well simply through practice. In general, the term "scientific method" (for the hypothetico-deductive method) should be avoided, since it may lead students to believe there is only one way to conduct scientific inquiries. Inductive studies have played a valuable role in science, as have mathematical and computer modeling. Hypotheses are not used formally by scientists in all research, nor are experiments per se the substance of all research. Candidates should study cases in which different approaches to inquiry are used in science, and should endeavor to communicate such differences to their students.
- The role of the teacher is not just to engage students in inquiry in order to develop their conceptual knowledge and process skills, but also to increase their understanding of how scientific inquiries are conducted, and how decisions are made in science. In this regard, the inquiry standards overlap and support the nature of science standards.
- Inquiry demands skill in the analysis of data and assessment of results to reach reasonable and valid conclusions. Candidates must be able to demonstrate not only that they know and understand common and different modes of scientific inquiry, but also that they can and do effectively engage students in inquiries. They should be able to demonstrate their effectiveness through student data profiles or similar means that they are effective in conducting such activities.

Standard 4: Issues

Teachers of science recognize that informed citizens must be prepared to make decisions and take action on contemporary science- and technology-related issues of interest to the general society. They require students to conduct inquiries into the factual basis of such issues and to assess possible actions and outcomes based upon their goals and values.

Elements

To show that they are prepared to engage students in studies of issues related to science, teachers of science must demonstrate that they:

a. Understand socially important issues related to science and technology in their field of licensure, as well as processes used to analyze and make decisions on such issues.
b. Engage students successfully in the analysis of problems, including considerations of risks, costs, and benefits of alternative solutions; relating these to the knowledge, goals and values of the students.

Indicators

- Science teacher preparation programs should give explicit attention to the study of socially important issues related to science and technology such as species preservation, land use, chemical pollution, weapons development, and cloning, to name but a few. Such issues may be introduced in science courses, but seldom do science courses provide for structured cost-benefit analyses or decision-making on these issues that considers all perspectives. Programs must ensure that candidates are prepared to lead students in learning how to dissect and analyze issues using data and information as resources.
- The question of how to consider an issue is just as important as the issues considered. To that end, candidates will themselves need to learn how to explore issues with an open mind. Once this is accomplished, they will need to learn how to lead students to explore these issues with the goal of making an informed and justified decision.
- To meet this standard, candidates must demonstrate that they are aware of important issues and are knowledgeable of approaches to analyzing these issues. Candidates should access common sources of information (newspapers, magazines, televised reports) to relate their science instruction to contemporary issues and events. They must then demonstrate through student achievement that they are able to effectively lead them in the study of an important issue.

Standard 5: General Skills of Teaching

Teachers of science create a community of diverse learners who construct meaning from their science experiences and possess a disposition for further exploration and learning. They use, and can justify, a variety of classroom arrangements, groupings, actions, strategies, and methodologies.

Elements

To show that they are prepared to create a community of diverse learners, teachers of science must demonstrate that they:

a. Vary their teaching actions, strategies, and methods to promote the development of multiple student skills and levels of understanding.
b. Successfully promote the learning of science by students with different abilities, needs, interests, and backgrounds.
c. Successfully organize and engage students in collaborative learning using different student group learning strategies.
d. Successfully use technological tools, including but not limited to computer technology, to access resources, collect and process data, and facilitate the learning of science.
e. Understand and build effectively upon the prior beliefs, knowledge, experiences, and interests of students.
f. Create and maintain a psychologically and socially safe and supportive learning environment.

Indicators

• The standards under the general teaching cluster are largely skills based and must be demonstrated by data from the classroom. Not all of the standards require demonstrations of student achievement or performance, but where effectiveness must be demonstrated, data from students should be used.
• Programs should provide candidates with ample opportunities to work with students using well-defined indicators of effective pedagogy. Candidates must go beyond demonstrating that they can create varied plans for instruction (as in a methods course) and actually implement a unit that has appropriate variety.
• Not all schools have diversity in terms of racial or ethnic makeup, but almost all have variations in socio-economic status, gender and learning styles. Candidates should be able to show how they have considered such differences in their planning and teaching. These considerations may be directed at a group or at individuals. For example, demonstrating the ability to make appropriate provisions for a student who does not speak English well, or who has a defined disability might be acceptable evidence of adapting instruction.
• The ability to use structured collaborative learning effectively is an important part of this standard. This includes, but goes beyond, setting up effective lab groups. Strategies such as Teams-Games-Tournament (TGT) and Student Teams, Achievement Division (STAD) are examples of alternative ways to organize instruction, where students teach each other (Slavin, 1996).
• Technology use is the emphasis of standard 16, as opposed to teaching about technology in contrast with science. The availability of technology in schools may limit the ability of some candidates to demonstrate their performance with students. If a teacher preparation program is situated in an area where computer technology is not common in the schools, it may be necessary to purchase laptops and lab ware for use in the schools.
• Pretesting and preconceptions surveys are excellent ways for candidates to determine the prior conceptual knowledge of their students. Candidates should also be able to show how they used prior conceptions and variations in the knowledge of their students to plan instruction in relation to the target concept.
• The cooperating teacher, using a rubric designed by the program, may assess classroom atmosphere. The candidate may also collect student feedback using an instrument of his or her own design.

Standard 6: Curriculum

Teachers of science plan and implement an active, coherent, and effective curriculum that is consistent with the goals and recommendations of the National Science Education Standards. They begin with the end in mind and effectively incorporate contemporary practices and resources into their planning and teaching.

Elements

To show that they are prepared to plan and implement an effective science curriculum, teachers of science must demonstrate that they:

a. Understand the curricular recommendations of the National Science Education Standards, and can identify, access, and/or create resources and activities for science education that are consistent with the standards.
b. Plan and implement internally consistent units of study that address the diverse goals of the National Science Education Standards and the needs and abilities of students.

Indicators

• Teacher candidates should engage in planning and implementing lessons and units of instruction early and often, and should be held responsible for demonstrating such planning throughout the program. With little experience in teaching, candidates may find such planning difficult and time-consuming. There is a tendency among novices to fall back upon activities for their own sake, rather than to deliberately plan a lesson or a unit with concern for how it might be made more effective. Practice in implementing units that have been designed to portray the National Science Education Standards and that have been field-tested may offer an opportunity to practice inquiry based teaching in a supportive context with a high probability of success.
• Resource units or collections of related materials are one way candidates can be shown to be familiar with a wide variety of materials in relation to a particular topic. Lesson plans and unit plans are generally required in most programs and can be used as data to verify that the program addresses the standards.
• Candidates can be asked to formally assess the internal consistency of their plans using program criteria

and may create a reflective narrative to explain that assessment. This assessment may then be returned as part of a portfolio or as an independent assessment and may be used by the program to verify candidate skills.

Standards 7: Science in the Community

Teachers of science relate their discipline to their local and regional communities, involving stakeholders and using the individual, institutional, and natural resources of the community in their teaching. They actively engage students in science-related studies or activities related to locally important issues.

Elements

To show that they are prepared to relate science to the community, teachers of science must demonstrate that they:

a. Identify ways to relate science to the community, involve stakeholders, and use community resources to promote the learning of science.
b. Involve students successfully in activities that relate science to resources and stakeholders in the community or to the resolution of issues important to the community.

Indicators

- To meet this standard, candidates must know the community in which they teach. Programs should provide candidates with the background and tools they need to learn about the community. This could include a community survey or visits to a community website that provides demographic and resource information about the community. Candidates should also know how to obtain information from their students that might help them to understand their needs, and might lead to guest speakers from the students' families.
- A good resource for finding out about the community is the local newspaper. News media may report on issues relevant to science and technology, which then may be used as the focus of discussion and cost-benefit analysis. It may be desirable for candidates to create and maintain a resource list for topics in their field and arrange to either take students to the field or have guest speakers come in. The Internet can also be a useful tool for finding resources in some communities.
- It is not always necessary for candidates to arrange for guest speakers or a field trip in order to make use of community resources. Students, alone or in small study groups, may be asked to investigate questions, collect data, visit sites, attend presentations, or interview people after school or on weekends.

Standards 8: Assessment

Teachers of science construct and use effective assessment strategies to determine the backgrounds and achievements of learners and facilitate their intellectual, social, and personal development. They assess students fairly and equitably, and require that students engage in ongoing self-assessment.

Elements

To show that they are prepared to use assessment effectively, teachers of science must demonstrate that they:

a. Use multiple assessment tools and strategies to achieve important goals for instruction that are aligned with methods of instruction and the needs of students.
b. Use the results of multiple assessments to guide and modify instruction, the classroom environment, or the assessment process.
c. Use the results of assessments as vehicles for students to analyze their own learning, engaging students in reflective self-analysis of their own work.

Indicators

- An important tenet of education is that the mode of assessment often drives methods of instruction rather than the other way around. The very nature of a performance based teacher preparation program requires candidates to pay far more attention to determining the results of instruction than has been necessary in the past.
- Multiple assessment tools should be aligned with the multiple purposes of instruction. Candidates should be

called upon to justify their selection of assessment tools in relation to the purposes of the instruction. For example, it is clearly inconsistent to use a multiple-choice quiz to assess the result of an open inquiry. Variety of assessments does not just include different kinds of traditional and nontraditional assessments, but also assessments to measure different dimensions of learning—cognitive, affective and psychomotor knowledge and skills—and dispositions of students.

- It would be expected that candidates should show at least some disposition to use assessments to guide and change instruction. These assessments may be formal or informal, formative or summative. A supervisor may note this occurring and assistant the candidate in reflecting upon this change. Alternatively, candidates may use pretests or may collect data formatively to determine whether further instruction on a concept or in a skill is needed. Some teachers have found it effective to asks students at the end of each class period to write something they have learned that day; they have then used the student response to guide their work the next day and clear up misconceptions or misunderstandings.
- It is also important that teachers be able to involve students in self-analysis. Too often assessment is something done to students. It takes little effort for candidates to include items that require student reflection on tests, projects, or activities they have completed. Conferencing with students using data from their assessments may also be a way of involving students in self assessment as long as the students themselves are doing the assessing: such conferences would not meet standard 25 if it is just another form of teacher assessment.

Standard 9: Safety and Welfare

Teachers of science organize safe and effective learning environments that promote the success of students and the welfare of all living things. They require and promote knowledge and respect for safety, and oversee the welfare of all living things used in the classroom or found in the field.

Elements

To show that they are prepared, teachers of science must demonstrate that they:

a. Understand the legal and ethical responsibilities of science teachers for the welfare of their students, the proper treatment of animals, and the maintenance and disposal of materials.
b. Know and practice safe and proper techniques for the preparation, storage, dispensing, supervision, and disposal of all materials used in science instruction.
c. Know and follow emergency procedures, maintain safety equipment, and ensure safety procedures appropriate for the activities and the abilities of students.
d. Treat all living organisms used in the classroom or found in the field in a safe, humane, and ethical manner and respect legal restrictions on their collection, keeping, and use.

Indicators

- Teacher preparation programs must ensure that candidates possess the knowledge needed to maintain a safe environment for all students. This includes knowledge of how to avoid or control hazardous materials or organisms, how to prepare and/or store materials properly, and how to clean up spills and dispose of chemicals safely.
- Candidates must know how to check and use safety equipment properly and the hazards of improperly shielded equipment, and must be able to avoid risks from fire hazards and biological contaminants.
- It is also important that candidates actually behave in a safe manner, model ethical and safe behavior, and ensure that students behave safely at all times. They must give proper safety instruction and causations, and must label materials and equipment in such a way as to maintain safety.
- In addition to safety concerns, candidates who may keep or use animals in the classroom or field should be knowledgeable of their care. They should know and comply with laws and professional standards for classroom treatment of animals and should be aware of regulations controlling the use of sentient, usually vertebrate, animals. They should be able to properly maintain the environment of the animals and dispose of wastes, respond to the illness of the animals and ensure that they have the food, water, space, shelter and care needed for their well-being.
- Where candidates may use viruses, microorganisms, or other living things potentially harmful to students, candidates should know how to clean up the classroom and dispose of materials in order to maintain safety

for students and anyone who may encounter such materials. Chemical hazards or biohazards must be dealt with according to rules and regulations that apply to all laboratories.

- Candidates should know and respect restrictions on collecting and using plants and animals, or parts of plants and animals, from the wild. They should be aware of the potential hazards of common plants as well as animals.
- Finally, they should know the common emergency precautions, responses, and reporting procedures that they are to follow in the event problems arise.
- Both knowledge and behaviors are essential components in demonstrating that this standard is met. Safety readings, tests, artifacts, projects, classroom safety evaluations, and so forth may be used to demonstrate knowledge and attention to safety matters. Reviews of regulations related to the collection and use of living things and general guidelines for safety and use of living things may also contribute to evidence of preparation. Actual performance in the classroom might be demonstrated by completion of a safety and ethical behaviors rubric or checklist by cooperating teachers.

Standard 10: Professional Growth

Teachers of science strive continuously to grow and change, personally and professionally, to meet the diverse needs of their students, school, community, and profession. They have a desire and disposition for growth and betterment.

Elements

To show their disposition for growth, teachers of science must demonstrate that they:

a. Engage actively and continuously in opportunities for professional learning and leadership that reach beyond minimum job requirements.
b. Reflect constantly upon their teaching and identify ways and means through which they may grow professionally.
c. Use information from students, supervisors, colleagues and others to improve their teaching and facilitate their professional growth.
d. Interact effectively with colleagues, parents, and students; mentor new colleagues; and foster positive relationships with the community.

Indicators

- Programs must help candidates the professional community as science educators.
- Science teaching is a composite profession requiring knowledge and skills in both science and education. Ideally, these skills come together in the preparation program.
- Associations and activities related to science teaching are abundant. Participation in such activities at the local, state and national levels should be encouraged, some being required.
- They are a resource for improving one's teaching, but also they provide the opportunity for constructive interaction with others in the same field.
- Teacher preparation programs should keep records of such activity so that they may then try to increase the activity of their candidates year by year.
- The best teachers tend to be goal-focused, but flexible and reflective. These characteristics allow them to relate to students and to modify and improve their practices.
- Candidates in teacher preparation programs must demonstrate the ability to reflect, but also to respond positively to constructive feedback from others. Few teacher educators are unfamiliar with candidates who enter their programs with preset ideas that they refuse to change, even when students do not respond well to them. It is imperative that such individuals not be allowed to continue on into teaching.
- The ability to get along with others is crucial in education, certainly with students, but also with other stakeholders such as teachers, administrators, support staff and parents.
- Dispositional factors can be assessed through the behaviors of candidates; candidates should be held accountable for behaviors that are contrary to the expectations of the profession as determined by the faculty and reflected in these standards.
- Carefully constructed criteria are needed and may be used as a source of data for candidate preparation and practice by the program.

Chemistry

Institutions and Organizations seeking State Approval for programs that prepare and result in the recommendation of candidates for licensure as Chemistry Teachers shall be required to demonstrate that they meet the following program standards. The standards below are an adapted version of the 2003 Standards of the National Science Teachers Association (NSTA) for the preparation of Science Teachers.

Standard 1: Content Knowledge

Teachers of science understand and can articulate the knowledge and practices of contemporary science. They can interrelate and interpret important concepts, ideas, and applications in their fields of licensure; and can conduct scientific investigations.

Elements

To show that they are prepared in content, teachers of chemistry must demonstrate that they:

a. Understand and can successfully convey to students the major concepts, principles, theories, laws, and interrelationships of their fields of licensure and supporting fields as recommended by the National Science Teachers Association.
b. Understand and can successfully convey to students the unifying concepts of science delineated by the National Science Education Standards.
c. Understand and can successfully convey to students important personal and technological applications of science in their fields of licensure.
d. Understand research and can successfully design, conduct, report and evaluate investigations in science.
e. Understand and can successfully use mathematics to process and report data, and solve problems, in their field(s) of licensure.

Indicators

All secondary teachers should also be prepared to lead students to understand the <u>unifying concepts of science</u> including:

- Multiple ways we organize our perceptions of the world and how systems organize the studies and knowledge of science.
- Nature of scientific evidence and the use of models for explanation.
- Measurement as a way of knowing and organizing observations of constancy and change.
- Evolution of natural systems and factors that result in evolution or equilibrium.
- Interrelationships of form, function, and behaviors in living and nonliving systems.

All teachers of chemistry should be prepared lead students to understand the unifying concepts required of all teachers of science, and should in addition be prepared to lead students to understand:

- Fundamental structures of atoms and molecules.
- Basic principles of ionic, covalent, and metallic bonding.
- Physical and chemical properties and classification of elements including periodicity.
- Chemical kinetics and thermodynamics.
- Principles of electrochemistry.
- Mole concept, stoichiometry, and laws of composition.
- Transition elements and coordination compounds.
- Acids and bases, oxidation-reduction chemistry, and solutions.
- Fundamental biochemistry.
- Functional and polyfunctional group chemistry.
- Environmental and atmospheric chemistry.

- Fundamental processes of investigating in chemistry.
- Applications of chemistry in personal and community health and environmental quality.

Teachers of chemistry as a primary field should also be prepared to effectively lead students to understand:
- Molecular orbital theory, aromaticity, metallic and ionic structures, and correlation to properties of matter.
- Superconductors and principles of metallurgy.
- Advanced concepts of chemical kinetics, and thermodynamics.
- Lewis adducts and coordination compounds.
- Solutions, colloids, and colligative properties.
- Major biological compounds and natural products.
- Solvent system concepts including non-aqueous solvents.
- Chemical reactivity and molecular structure including electronic and steric effects.
- Organic synthesis and organic reaction mechanisms.
- Energy flow through chemical systems.
- Issues related to chemistry including ground water pollution, disposal of plastics, and development of alternative fuels.
- Historical development and perspectives in chemistry including contributions of significant figures and underrepresented groups, and the evolution of theories in chemistry.
- How to design, conduct, and report research in chemistry.
- Applications of chemistry and chemical technology in society, business, industry, and health fields.

All teachers of chemistry should be prepared to effectively apply concepts from other sciences and mathematics to the teaching of chemistry including:
- Biology, including molecular biology, bioenergetics, and ecology.
- Earth science, including geochemistry, cycles of matter, and energetics of Earth systems.
- Physics, including energy, stellar evolution, properties and functions of waves, motions and forces, electricity, and magnetism.
- Mathematical and statistical concepts and skills including statistics and the use of differential equations and calculus.

Standard 2: Nature of Science

Teachers of science engage students effectively in studies of the history, philosophy, and practice of science. They enable students to distinguish science from non-science, understand the evolution and practice of science as a human endeavor, and critically analyze assertions made in the name of science.

Elements

To show they are prepared to teach the nature of science, teachers of science must demonstrate that they:

a. Understand the historical and cultural development of science and the evolution of knowledge in their discipline.
b. Understand the philosophical tenets, assumptions, goals, and values that distinguish science from technology and from other ways of knowing the world.
c. Engage students successfully in studies of the nature of science including, when possible, the critical analysis of false or doubtful assertions made in the name of science.

Indicators

All students of science, whether teacher candidates or not, should have knowledge of the nature of science as defined in this standard, and should have the skills needed to engage students in the critical analysis of scientific and pseudoscientific claims in an appropriate way. This requires explicit attention to the nature of science, as defined in this standard, as a part of the preparation of science teachers.

Candidates should:

- Have multiple opportunities to study and analyze literature related to the history and nature of science, such as The Demon Haunted World (Sagan, 1996); Great Feuds in Science (Hellman, 1998) Facts, Fraud and Fantasy (Goran, 1979) and The Structure of Scientific Revolutions (Kuhn, 1962).
- Be required to analyze, discuss and debate topics and reports in the media related to the nature of science and scientific knowledge in courses and seminars throughout the program, not just in an educational context. Students should engage in active investigation and analysis of the conventions of science as reflected in papers and reports in science, across fields, in order to understand similarities and differences in methods and interpretations in science, and to identify strengths and weaknesses of findings.
- Demonstrate that they are effective by successfully engaging students in the study of the nature of science. Assessments with regard to understanding may include such possibilities as completion of independent study courses, seminars or assignments; projects; papers; summative readings; or case study analyses. Assessments of effectiveness must include at least some demonstrably positive student outcomes in studies related to the nature of science as delineated by the standards in this cluster.

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Teachers of science engage students both in studies of various methods of scientific inquiry and in active learning through scientific inquiry. They encourage students, individually and collaboratively, to observe, ask questions, design inquiries, and collect and interpret data in order to develop concepts and relationships from empirical experiences.

Elements

To show that they are prepared to teach through inquiry, teachers of science must demonstrate that they:

a. Understand the processes, tenets, and assumptions of multiple methods of inquiry leading to scientific knowledge.
b. Engage students successfully in developmentally appropriate inquiries that require them to develop concepts and relationships from their observations, data, and inferences in a scientific manner.

Indicators

- Candidates in a science teacher preparation program should be provided with multiple opportunities to solve open-ended problems using appropriate scientific methods. These opportunities should be present in their science content courses, but also should be fundamental in their science methods preparation. Many candidates enter teaching because they want to impart knowledge: It is not easy for them to lead students by listening and questioning, and to allow students to infer proposed solutions to problems. Practice is essential.
- The preparation of teachers for the elementary level, especially generalists, should require inquiry-based university science courses. Stalheim-Smith and Scharmann (1996) and Stoddart, Connell, Stofflett and Peck (1993) found that the use of constructivist teaching methodologies and learning cycles, methods that are generally inquiry-based, improved the learning of science by candidates in elementary education. Such courses also may increase the confidence level of generalists, who are often not confident in their ability to do science.
- Secondary programs should also strongly emphasize inquiry and pay close attention to preparing teachers to effectively lead students in such activities. All programs should provide explicit instruction in the nature of inquiry as well as its applications. Like the nature of science, inquiry is not learned well simply through practice. In general, the term "scientific method" (for the hypothetico-deductive method) should be avoided, since it may lead students to believe there is only one way to conduct scientific inquiries. Inductive studies have played a valuable role in science, as have mathematical and computer modeling. Hypotheses are not used formally by scientists in all research, nor are experiments per se the substance of all research. Candidates should study cases in which different approaches to inquiry are used in science, and should endeavor to communicate such differences to their students.
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Indicators

• Teacher candidates should engage in planning and implementing lessons and units of instruction early and often, and should be held responsible for demonstrating such planning throughout the program. With little experience in teaching, candidates may find such planning difficult and time-consuming. There is a tendency among novices to fall back upon activities for their own sake, rather than to deliberately plan a lesson or a unit with concern for how it might be made more effective. Practice in implementing units that have been

designed to portray the National Science Education Standards and that have been field-tested may offer an opportunity to practice inquiry based teaching in a supportive context with a high probability of success.

- Resource units or collections of related materials are one way candidates can be shown to be familiar with a wide variety of materials in relation to a particular topic. Lesson plans and unit plans are generally required in most programs and can be used as data to verify that the program addresses the standards.
- Candidates can be asked to formally assess the internal consistency of their plans using program criteria and may create a reflective narrative to explain that assessment. This assessment may then be returned as part of a portfolio or as an independent assessment and may be used by the program to verify candidate skills.

Standards 7: Science in the Community

Teachers of science relate their discipline to their local and regional communities, involving stakeholders and using the individual, institutional, and natural resources of the community in their teaching. They actively engage students in science-related studies or activities related to locally important issues.

Elements

To show that they are prepared to relate science to the community, teachers of science must demonstrate that they:

a. Identify ways to relate science to the community, involve stakeholders, and use community resources to promote the learning of science.
b. Involve students successfully in activities that relate science to resources and stakeholders in the community or to the resolution of issues important to the community.

Indicators

- To meet this standard, candidates must know the community in which they teach. Programs should provide candidates with the background and tools they need to learn about the community. This could include a community survey or visits to a community website that provides demographic and resource information about the community. Candidates should also know how to obtain information from their students that might help them to understand their needs, and might lead to guest speakers from the students' families.
- A good resource for finding out about the community is the local newspaper. News media may report on issues relevant to science and technology, which then may be used as the focus of discussion and cost-benefit analysis. It may be desirable for candidates to create and maintain a resource list for topics in their field and arrange to either take students to the field or have guest speakers come in. The Internet can also be a useful tool for finding resources in some communities.
- It is not always necessary for candidates to arrange for guest speakers or a field trip in order to make use of community resources. Students, alone or in small study groups, may be asked to investigate questions, collect data, visit sites, attend presentations, or interview people after school or on weekends.

Standards 8: Assessment

Teachers of science construct and use effective assessment strategies to determine the backgrounds and achievements of learners and facilitate their intellectual, social, and personal development. They assess students fairly and equitably, and require that students engage in ongoing self-assessment.

Elements

To show that they are prepared to use assessment effectively, teachers of science must demonstrate that they:

a. Use multiple assessment tools and strategies to achieve important goals for instruction that are aligned with methods of instruction and the needs of students.
b. Use the results of multiple assessments to guide and modify instruction, the classroom environment, or the assessment process.
c. Use the results of assessments as vehicles for students to analyze their own learning, engaging students in reflective self-analysis of their own work.

Indicators

- An important tenet of education is that the mode of assessment often drives methods of instruction rather than the other way around. The very nature of a performance based teacher preparation program requires candidates to pay far more attention to determining the results of instruction than has been necessary in the past.
- Multiple assessment tools should be aligned with the multiple purposes of instruction. Candidates should be called upon to justify their selection of assessment tools in relation to the purposes of the instruction. For example, it is clearly inconsistent to use a multiple-choice quiz to assess the result of an open inquiry. Variety of assessments does not just include different kinds of traditional and nontraditional assessments, but also assessments to measure different dimensions of learning—cognitive, affective and psychomotor knowledge and skills—and dispositions of students.
- It would be expected that candidates should show at least some disposition to use assessments to guide and change instruction. These assessments may be formal or informal, formative or summative. A supervisor may note this occurring and assistant the candidate in reflecting upon this change. Alternatively, candidates may use pretests or may collect data formatively to determine whether further instruction on a concept or in a skill is needed. Some teachers have found it effective to asks students at the end of each class period to write something they have learned that day; they have then used the student response to guide their work the next day and clear up misconceptions or misunderstandings.
- It is also important that teachers be able to involve students in self-analysis. Too often assessment is something done to students. It takes little effort for candidates to include items that require student reflection on tests, projects, or activities they have completed. Conferencing with students using data from their assessments may also be a way of involving students in self assessment as long as the students themselves are doing the assessing: such conferences would not meet standard 25 if it is just another form of teacher assessment.

Standard 9: Safety and Welfare

Teachers of science organize safe and effective learning environments that promote the success of students and the welfare of all living things. They require and promote knowledge and respect for safety, and oversee the welfare of all living things used in the classroom or found in the field.

Elements

To show that they are prepared, teachers of science must demonstrate that they:

a. Understand the legal and ethical responsibilities of science teachers for the welfare of their students, the proper treatment of animals, and the maintenance and disposal of materials.
b. Know and practice safe and proper techniques for the preparation, storage, dispensing, supervision, and disposal of all materials used in science instruction.
c. Know and follow emergency procedures, maintain safety equipment, and ensure safety procedures appropriate for the activities and the abilities of students.
d. Treat all living organisms used in the classroom or found in the field in a safe, humane, and ethical manner and respect legal restrictions on their collection, keeping, and use.

Indicators

- Teacher preparation programs must ensure that candidates possess the knowledge needed to maintain a safe environment for all students. This includes knowledge of how to avoid or control hazardous materials or organisms, how to prepare and/or store materials properly, and how to clean up spills and dispose of chemicals safely.
- Candidates must know how to check and use safety equipment properly and the hazards of improperly shielded equipment, and must be able to avoid risks from fire hazards and biological contaminants.
- It is also important that candidates actually behave in a safe manner, model ethical and safe behavior, and ensure that students behave safely at all times. They must give proper safety instruction and causations, and must label materials and equipment in such a way as to maintain safety.
- In addition to safety concerns, candidates who may keep or use animals in the classroom or field should be

knowledgeable of their care. They should know and comply with laws and professional standards for classroom treatment of animals and should be aware of regulations controlling the use of sentient, usually vertebrate, animals. They should be able to properly maintain the environment of the animals and dispose of wastes, respond to the illness of the animals and ensure that they have the food, water, space, shelter and care needed for their well-being.

- Where candidates may use viruses, microorganisms, or other living things potentially harmful to students, candidates should know how to clean up the classroom and dispose of materials in order to maintain safety for students and anyone who may encounter such materials. Chemical hazards or biohazards must be dealt with according to rules and regulations that apply to all laboratories.
- Candidates should know and respect restrictions on collecting and using plants and animals, or parts of plants and animals, from the wild. They should be aware of the potential hazards of common plants as well as animals.
- Finally, they should know the common emergency precautions, responses, and reporting procedures that they are to follow in the event problems arise.
- Both knowledge and behaviors are essential components in demonstrating that this standard is met. Safety readings, tests, artifacts, projects, classroom safety evaluations, and so forth may be used to demonstrate knowledge and attention to safety matters. Reviews of regulations related to the collection and use of living things and general guidelines for safety and use of living things may also contribute to evidence of preparation. Actual performance in the classroom might be demonstrated by completion of a safety and ethical behaviors rubric or checklist by cooperating teachers.

Standard 10: Professional Growth

Teachers of science strive continuously to grow and change, personally and professionally, to meet the diverse needs of their students, school, community, and profession. They have a desire and disposition for growth and betterment.

Elements

To show their disposition for growth, teachers of science must demonstrate that they:

a. Engage actively and continuously in opportunities for professional learning and leadership that reach beyond minimum job requirements.
b. Reflect constantly upon their teaching and identify ways and means through which they may grow professionally.
c. Use information from students, supervisors, colleagues and others to improve their teaching and facilitate their professional growth.
d. Interact effectively with colleagues, parents, and students; mentor new colleagues; and foster positive relationships with the community.

Indicators

- Programs must help candidates the professional community as science educators.
- Science teaching is a composite profession requiring knowledge and skills in both science and education. Ideally, these skills come together in the preparation program.
- Associations and activities related to science teaching are abundant. Participation in such activities at the local, state and national levels should be encouraged, some being required.
- They are a resource for improving one's teaching, but also they provide the opportunity for constructive interaction with others in the same field.
- Teacher preparation programs should keep records of such activity so that they may then try to increase the activity of their candidates year by year.
- The best teachers tend to be goal-focused, but flexible and reflective. These characteristics allow them to relate to students and to modify and improve their practices.
- Candidates in teacher preparation programs must demonstrate the ability to reflect, but also to respond positively to constructive feedback from others. Few teacher educators are unfamiliar with candidates who enter their programs with preset ideas that they refuse to change, even when students do not respond well

to them. It is imperative that such individuals not be allowed to continue on into teaching.

- The ability to get along with others is crucial in education, certainly with students, but also with other stakeholders such as teachers, administrators, support staff and parents.
- Dispositional factors can be assessed through the behaviors of candidates; candidates should be held accountable for behaviors that are contrary to the expectations of the profession as determined by the faculty and reflected in these standards.
- Carefully constructed criteria are needed and may be used as a source of data for candidate preparation and practice by the program.

English/Language Arts

Institutions and Organizations seeking State Approval for programs that prepare and result in the recommendation of candidates for licensure as Teachers of Secondary English Language Arts shall be required to demonstrate that they meet the following program standards. The standards below are an adapted version of the 2001 Standards of the National Council of Teachers of English (NCTE) for the preparation of Secondary English/Language Arts teachers.

Standard 1 - Program Structure	
Description	**Indicators**
Candidates follow a specific curriculum and are expected to meet appropriate performance assessments for pre-service English language arts teachers.	Candidates: • Complete a program of study reflecting a frame-work that encompasses both the content and practice appropriate for ELA teachers. • Explore both theory and practice in their ELA preparation and meet performance requirements in a range of field experiences, including a minimum of ten weeks of student teaching in ELA classrooms, that are supervised and assessed as a part of the overall preparation program by ELA licensed teachers • Work with faculty in English and education who demonstrate through the courses they teach and their professional development activities that they are current in their content knowledge and in their practice of effective pedagogy and attitudes appropriate to preparing ELA teachers. • Meet performance criteria within an assessment system that assesses candidates' performances at appropriate transition points throughout the ELA program.
Standard 2 - Candidate Attitudes	
Description	**Indicators**
Through modeling, advisement, instruction, field experiences, assessment of performance, and involvement in professional organizations, candidates adopt and strengthen professional attitudes needed by English language arts teachers.	Candidates: • Create an inclusive and supportive learning environment in which all students can engage in learning. • Use ELA to help their students become familiar with their own and others' cultures. • Demonstrate reflective practice, involvement in professional organizations, and collaboration with both faculty and other candidates. • Use practices designed to assist students in developing habits of critical thinking and judgment. • Make meaningful connections between the ELA curriculum and developments in culture, society, and education. • Engage their students in activities that demonstrate the role of arts and humanities in learning.

Standard 3 - Candidate Knowledge Candidates are knowledgeable about language; literature; oral, visual, and written literacy; print and non-print media; technology; and research theory and findings.	
Elements	**Indicators**
3.1 Candidates demonstrate knowledge of, and skills in the use of, the English language.	Candidates: • Use knowledge of students' language acquisition and development as a basis for designing appropriate learning activities that promote student learning. • Demonstrate how reading, writing, speaking, listening, viewing, and thinking are interrelated in their own learning and in their students' learning of ELA. • Demonstrate an awareness in their teaching of the impact of cultural, economic, political, and social environments on language. • Know and respect diversity in language use, patterns, and dialects across cultures, ethnic groups, geographic regions and social roles and show attention to accommodating such diversity in their teaching • Demonstrate knowledge of the evolution of the English language and the historical influences on its various forms and use this knowledge in their teaching • Use their knowledge of English grammars in teaching students both oral and written forms of the language. • Use their knowledge of semantics, syntax, morphology, and phonology in teaching their students how to use oral and written language.
3.2 Candidates demonstrate knowledge of the practices of oral, visual, and written literacy.	Candidates: • Use their understanding of the influence of language and visual images on thinking and composing in their own work and in their teaching. • Use writing, speaking, and observing as major forms of inquiry, reflection, and expression in their coursework and teaching. • Use composing processes in creating various forms of oral, visual, and written literacy of their own and engage students in these processes. • Demonstrate, through their own learning and teaching, how writing, visual images, and speaking can effectively perform a variety of functions for varied audiences and purposes. • Demonstrate their knowledge of language structure and conventions by creating and critiquing their own print and non-print texts and by assisting their students in such activities.

3.3 Candidates demonstrate their knowledge of reading processes.	Candidates: • Respond to and interpret, in varied ways, what is read, teaching their students how to do this as well. • Discover and create meaning from texts and guide students in the same processes. • Use a wide variety of strategies to comprehend, interpret, evaluate, and appreciate texts and teach those strategies to students.
3.4 Candidates demonstrate knowledge of different composing processes.	Candidates: • Use a variety of writing strategies to generate meaning and clarify understanding and draw upon that knowledge and skill in their teaching. • Produce different forms of written discourse and understand how written discourse can influence thought and action.
3.5 Candidates demonstrate knowledge of, and uses for, an extensive range of literature.	Candidates know and use a variety of teaching applications for: • Works representing a broad historical and contemporary spectrum of United States, British, and world, including non-Western, literature. • Works from a wide variety of genres and cultures, works by female authors, and works by authors of color. • Numerous works specifically written for older children and younger adults. • A range of works of literary theory and criticism.
3.6 Candidates demonstrate knowledge of the range and influence of print and non-print media and technology in contemporary culture.	Candidates: • Understand how media can influence constructions of a text's meaning, and how experiencing various media can enhance students' composing processes, communication, and learning. • Show an ability to construct meaning from media and non-print texts, and to assist students in learning these processes. • Incorporate technology and print/non-print media into their own work and instruction.
3.7 Candidates demonstrate knowledge of research theory and findings in English language arts.	Candidates: • Use major sources of research and theory related to English language arts to support their teaching decisions. • Use teacher-researcher models of classroom inquiry to inform their own study and teaching.

Standard 4 - Candidate Pedagogy

Description	Indicators
Candidates acquire and demonstrate the dispositions and skills needed to integrate knowledge of English language arts, students, and teaching.	Candidates: • Examine and select resources for instruction such as textbooks, other print materials, videos, films, records, and software, appropriate for supporting the teaching of English language arts. • Align curriculum goals and teaching strategies with the organization of classroom environments and learning experiences to promote whole-class, small-group, and individual work. • Integrate interdisciplinary teaching strategies and materials into the teaching and learning process for students. • Create and sustain learning environments that promote respect for, and support of, individual differences of ethnicity, race, language, culture, gender, and ability. • Engage students often in meaningful discussions for the purposes of interpreting and evaluating ideas presented through oral, written, and/or visual forms. • Engage students in critical analysis of different media and communications technologies. • Engage students in learning experiences that consistently emphasize varied uses and purposes for language in communication. • Engage students in making meaning of texts through personal response. • Demonstrate that their students can select appropriate reading strategies that permit access to, and understanding of, a wide range of print and non-print texts. • Integrate assessment consistently into instruction by using a variety of formal and informal assessment activities and instruments to evaluate processes and products, and creating regular opportunities to use a variety of ways to interpret and report assessment methods and results to students, parents, administrators, and other audiences.

Secondary Mathematics (7-12)

Institutions and Organizations seeking State Approval for programs that prepare and result in the recommendation for licensure as teachers of Secondary Mathematics Education shall be required to demonstrate that they meet the following program standards. The standards below are an adapted version of the 2003 Standards of National Council of Teachers of Mathematics for the preparation of Secondary Mathematics Teachers.

Standard 1: Knowledge of Mathematical Problem-Solving	
Description	**Indicators**
Candidates know, understand, and apply the process of mathematical problem solving.	Candidates are able to: • Apply and adapt a variety of appropriate strategies to solve problems. • Solve problems that arise in mathematics and those involving mathematics in other contexts. • Build new mathematical knowledge through problem solving. • Monitor and reflect on the process of mathematical problem solving.
Standard 2: Knowledge of Reasoning and Proof	
Description	**Indicators**
Candidates reason, construct, and evaluate mathematical arguments and develop an appreciation for mathematical rigor and inquiry.	Candidates are able to: • Recognize reasoning and proof as fundamental aspects of mathematics. • Make and investigate mathematical conjectures. • Develop and evaluate mathematical arguments and proofs. • Select and use various types of reasoning and methods of proof.
Standard 3: Knowledge of Mathematical Communication	
Description	**Indicators**
Candidates communicate their mathematical thinking orally and in writing to peers, faculty, and others.	Candidates are able to: • Communicate their mathematical thinking coherently and clearly to peers, faculty, and others. • Use the language of mathematics to express ideas precisely. • Organize mathematical thinking through communication. • Analyze and evaluate the mathematical thinking and strategies of others.
Standard 4: Knowledge of Mathematical Connections	
Description	**Indicators**
Candidates recognize, use, and make connections between and among mathematical ideas and in contexts outside mathematics to build mathematical understanding.	Candidates are able to: • Recognize and use connections among mathematical ideas. • Recognize and apply mathematics in contexts outside of mathematics. • Demonstrate how mathematical ideas interconnect and build on one another to produce a coherent whole.

Standard 5: Knowledge of Mathematical Representation	
Description	**Indicators**
Candidates use varied representations of mathematical ideas to support and deepen students' mathematical understanding.	Candidates are able to: • Use representations to model and interpret physical, social, and mathematical phenomena. • Create and use representations to organize, record, and communicate mathematical ideas. • Select, apply, and translate among mathematical representations to solve problems.
Standard 6: Knowledge of Technology	
Description	**Indicator**
Candidates embrace technology as an essential tool for teaching and learning mathematics.	Candidates are able to: • Use knowledge of mathematics to select and use appropriate technological tools, such as but not limited to, spreadsheets, dynamic graphing tools, computer algebra systems, dynamic statistical packages, graphing calculators, data-collection devices, and presentation software.
Standard 7: Dispositions	
Description	**Indicators**
Candidates support a positive disposition toward mathematical processes and mathematical learning.	Candidates: • Pay attention to equity. • Use stimulating curricula. • Teach effectively. • Have a commitment to learning with understanding. • Use various assessments. • Use various teaching tools including technology.
Standard 8: Knowledge of Mathematics Pedagogy	
Description	**Indicators**
Candidates possess a deep understanding of how students learn mathematics and of the pedagogical knowledge specific to mathematics teaching and learning.	Candidates are able to: • Selects, uses, and determines suitability of the wide variety of available mathematics curricula and teaching materials for all students including those with special needs such as the gifted, challenged and speakers of other languages. • Selects and uses appropriate concrete materials for learning mathematics. • Uses multiple strategies, including listening to and understanding the ways students think about mathematics, to assess students' mathematical knowledge. • Plans lessons, units and courses that address appropriate learning goals, including those that address local, state, and national mathematics standards and legislative mandates. • Participates in professional mathematics organizations and uses their print and on-line resources. • Demonstrates knowledge of research results in the teaching and learning of mathematics. • Uses knowledge of different types of instructional strategies in planning mathematics lessons.

	• Demonstrates the ability to lead classes in mathematical problem solving and in developing in-depth conceptual understanding, and to help students develop and test generalizations. • Develop lessons that use technology's potential for building understanding of mathematical concepts and developing important mathematical ideas.
Standard 9: Knowledge of Number and Operation	
Description	**Indicators**
Candidates demonstrate computational proficiency, including a conceptual understanding of numbers, ways of representing number, relationships among number and number systems, and meanings of operations.	Candidates are able to: • Analyze and explain the mathematics that underlies the procedures used for operations involving integers, rational, real, and complex numbers. • Use properties involving number and operations, mental computation, and computational estimation. • Provide equivalent representations of fractions, decimals, and percents. • Create, solve, and apply proportions. • Apply the fundamental ideas of number theory. • Make sense of large and small numbers and use scientific notation. • Compare and contrast properties of numbers and number systems. • Represent, use, and apply complex numbers. • Recognize matrices and vectors as systems that have some of the properties of the real number system. • Demonstrate knowledge of the historical development of number and number systems including contributions from diverse cultures.
Standard 10: Knowledge of Different Perspectives on Algebra	
Description	**Indicators**
Candidates emphasize relationships among quantities including functions, ways of representing mathematical relationships, and the analysis of change.	Candidates are able to: • Analyze patterns, relations, and functions of one and two variables. • Apply fundamental ideas of linear algebra. • Apply the major concepts of abstract algebra to justify algebraic operations and formally analyze algebraic structures. • Use mathematical models to represent and understand quantitative relationships. • Use technological tools to explore algebraic ideas and representations of information and in solving problems. • Demonstrate knowledge of the historical development of algebra including contributions from diverse cultures.
Standard 11: Knowledge of Geometries	
Description	**Indicators**
Candidates use spatial visualization and geometric modeling to explore and analyze geometric shapes, structures, and their properties.	Candidates are able to: • Demonstrate knowledge of core concepts and principles of Euclidean and non-Euclidean geometries in two and three dimensions from both formal and informal perspectives. • Exhibit knowledge of the role of axiomatic systems and proofs in geometry. • Analyze characteristics and relationships of geometric shapes and structures. • Build and manipulate representations of two- and three- dimensional objects and visualize objects from different perspectives.

	• Specify locations and describe spatial relationships using coordinate geometry, vectors, and other representational systems. • Apply transformations and use symmetry, similarity, and congruence to analyze mathematical situations. • Use concrete models, drawings, and dynamic geometric software to explore geometric ideas and their applications in real-world contexts. • Demonstrate knowledge of the historical development of Euclidean and non-Euclidean geometries including contributions from diverse cultures.
Standard 12: Knowledge of Calculus	
Description	**Indicators**
Candidates demonstrate a conceptual understanding of limit, continuity, differentiation, and integration and a thorough background in the techniques and application of the calculus.	Candidates are able to: • Demonstrate a conceptual understanding of and procedural facility with basic calculus concepts. • Apply concepts of function, geometry, and trigonometry in solving problems involving calculus. • Use the concepts of calculus and mathematical modeling to represent and solve problems taken from real-world contexts. • Use technological tools to explore and represent fundamental concepts of calculus. • Demonstrate knowledge of the historical development of calculus including contributions from diverse cultures.
Standard 13: Knowledge of Discrete Mathematics	
Description	**Indicators**
Candidates apply the fundamental ideas of discrete mathematics in the formulation and solution of problems.	Candidates are able to: • Demonstrate knowledge of basic elements of discrete mathematics such as graph theory, recurrence relations, finite difference approaches, linear programming, and combinatorics. • Apply the fundamental ideas of discrete mathematics in the formulation and solution of problems arising from real-world situations. • Use technological tools to solve problems involving the use of discrete structures and the application of algorithms. • Demonstrate knowledge of the historical development of discrete mathematics including contributions from diverse cultures.
Standard 14: Knowledge of Data Analysis, Statistics, and Probability	
Description	**Indicators**
Candidates demonstrate an understanding of concepts and practices related to data analysis, statistics, and probability.	Candidates are able to: • Design investigations, collect data, and use a variety of ways to display data and interpret data representations that may include bivariate data, conditional probability and geometric probability. • Use appropriate methods such as random sampling or random assignment of treatments to estimate population characteristics, test conjectured relationships among variables, and analyze data. • Use appropriate statistical methods and technological tools to describe shape and analyze spread and center. • Use statistical inference to draw conclusions from data. • Identify misuses of statistics and invalid conclusions from probability. • Draw conclusions involving uncertainty by using hands-on and computer-based simulation for estimating probabilities and gathering data to make inferences and conclusions.

	• Determine and interpret confidence intervals. • Demonstrate knowledge of the historical development of statistics and probability including contributions from diverse cultures.
Standard 15: Knowledge of Measurement	
Description	**Indicators**
Candidates apply and use measurement concepts and tools.	Candidates are able to: • Recognize the common representations and uses of measurement and choose tools and units for measuring. • Apply appropriate techniques, tools, and formulas to determine measurements and their application in a variety of contexts. • Completes error analysis through determining the reliability of the numbers obtained from measures. • Demonstrate knowledge of the historical development of measurement and measurement systems including contributions from diverse cultures.
Standard 16: Field-Based Experiences	
Description	**Indicators**
Candidates complete field-based experiences in mathematics classrooms.	Candidates are able to: • Engage in a sequence of planned opportunities prior to student teaching that includes observing and participating in both middle and secondary mathematics classrooms under the supervision of experienced and highly qualified teachers. • Experience full-time student teaching in secondary mathematics that is supervised by a highly qualified teacher and a university or college supervisor with secondary mathematics teaching experience. • Demonstrate the ability to increase students' knowledge of mathematics.

Social Studies

Institutions and Organizations seeking State Approval for programs that prepare and result in the recommendation of candidates for licensure as teachers of Social Studies shall be required to demonstrate that they meet the following program standards. The standards below are an adapted version of the 2003 Standards of National Council for the Social Studies (NCSS) for the preparation of Social Studies Teachers.

Standard 1 – INTERDISCIPLINARY THEMATIC STANDARDS	
Elements	**Indicators**
1.1 CULTURE AND CULTURAL DIVERSITY Candidates in social studies should possess the knowledge, capabilities, and dispositions to organize and provide instruction at the appropriate school level for the study of Culture and Culture Diversity.	Candidates: • Enable learners to analyze and explain how groups, societies, and cultures address human needs and concerns; • Guide learners as they predict how experiences may be interpreted by people from diverse cultural perspectives and frames of references; • Assist learners to apply an understanding and of culture as an integrated whole that governs the functions and interactions of language, literature, arts, traditions, beliefs, values, and behavior patterns; • Encourage learners to compare and to analyze societal patterns for transmitting and preserving culture while adapting to environmental and social change; • Ask learners to give examples and describe the importance of cultural unity and diversity within and across groups; • Have learners interpret patterns of behavior as reflecting values and attitudes, that contribute to or pose obstacles to cross-cultural understanding; • Guide learners as they construct reasoned judgments about specific cultural responses to persistent human issues; • Have learners explain and apply ideas, theories, and modes of inquiry drawn from anthropology and sociology in the examination of persistent issues and social problems.
1.2 TIME, CONTINUITY, AND CHANGE Candidates in social studies should possess the knowledge, capabilities, and dispositions to organize and provide instruction at the appropriate school level for the study of Time, Continuity, and Change.	Candidates: • Assist learners to understand that historical knowledge and the concept of time are socially influenced constructions that lead historians to be selective in the questions they seek to answer and the evidence they use; • Help learners apply key concepts from the study of history — such as time, chronology, causality, change, conflict, and complexity — to explain, analyze, and show connections among patterns of historical change and continuity; • Enable learners to identify and describe significant historical periods and patterns of change within and across cultures, including but not limited to, the development of ancient cultures and civilizations, the emergence of religious belief systems, the rise of nation-states, and social, economic, and political revolutions; • Guide learners in using processes of critical historical inquiry to

	reconstruct and reinterpret the past, such as using a variety of sources and checking their credibility, validating and weighing evidence for claims, and searching for causality, and distinguishing between events and developments that are significant from those that are inconsequential; • Provide learners with opportunities to investigate, interpret, and analyze multiple historical and contemporary viewpoints within and across cultures related to important events, recurring dilemmas, and persistent issues, while employing empathy, skepticism, and critical judgment; • Enable learners to apply ideas, theories, and modes of historical inquiry to analyze historical and contemporary developments, and to inform and evaluate actions concerning public policy issues.
1.3 PEOPLE, PLACES, AND ENVIRONMENTS Candidates in social studies should possess the knowledge, capabilities, and dispositions to organize and provide instruction at the appropriate school level for the study of People, Places, and Environments.	Candidates: • Enable learners to use, interpret, and distinguish various representations of Earth, such as maps, globes and photographs, and to use appropriate geographic tools; • Encourage learners to construct, use, and refine maps and mental maps; calculate distance, scale, area, and density; and organize information about people, places, regions, and environments in a spatial context; • Help learners to locate, distinguish, and describe the relationships among varying regional and global patterns of physical systems such as landforms, climate, and natural resources, and explain changes in the physical systems; • Guide learners in exploring characteristics, distribution, and migration of human populations on Earth's surface; • Assist learners in describing how people create places that reflect culture, human needs, current values and ideals, and government policies; • Help learners to examine, interpret, and analyze interactions between human beings and their physical environments, and to observe and analyze social and economic effects of environmental changes, both positive and negative; • Challenge learners to consider, compare, and evaluate existing uses of resources and land in communities, regions, countries, and the world; • Help learners explore ways in which Earth's physical features have changed over time, and describe and assess ways historical events have influenced and been influenced by physical and human geographic features.
1.4 INDIVIDUAL DEVELOPMENT AND IDENTITY Candidates in social studies should possess the knowledge, capabilities, and dispositions to organize and provide instruction at the appropriate school level for the study of Individual Development and Identity.	Candidates • Help learners comprehend and apply concepts, theories, and principles associated with human cognitive, emotional, and personal development; • Enable learners to understand how the development and maturation of the brain and body influence thought and perception. • Assist learners in articulating personal connections to time, place, and social/cultural systems;

	• Help learners to appreciate and describe the influence of cultures, past and present, upon the daily lives of individuals; • Assist learners to describe how family, religion, gender, ethnicity, nationality, socioeconomic status, and other group and cultural influences contribute to the development of a sense of self; • Enable learners to apply concepts, inquiry methods, and theories in the study of human growth and development, learning, motivation, behavior, perception, and personality; • Guide learners as they analyze the interactions among ethical, ethnic, national, and cultural factors in specific situations; • Help learners to analyze the role of perceptions, attitudes, values, and beliefs in the development of personal identity and on human behavior; • Enable learners to compare and to evaluate the impact of stereotyping, conformity, acts of altruism, discrimination, and other behaviors on individuals and groups; • Help learners understand how individual perceptions develop, vary, and can lead to conflict; • Assist learners as they work independently and cooperatively within groups and institutions to accomplish goals; • Encourage learners to examine factors that contribute to and damage one's mental health and to analyze issues related to mental health and behavioral disorders in contemporary society.
1.5 INDIVIDUALS, GROUPS, AND INSTITUTIONS Candidates in social studies should possess the knowledge, capabilities, and dispositions to organize and provide instruction at the appropriate school level for the study of Individuals, Groups, and Institutions.	Candidates: • Help learners understand the concepts of role, status, and social class and use them in describing the connections and interactions among individuals, groups, and institutions in society; • Help learners analyze groups and calculate the influence of institutions on people, events, and elements of cultures in both historical and contemporary settings; • Help learners understand the various forms institutions take, their functions, their relationships to one another, and explain how they develop and change over time; • Assist learners in identifying and analyzing examples of tensions between expressions of individuality and efforts of groups and institutions to promote social conformity; • Enable learners to describe and examine belief systems basic to specific traditions and laws in contemporary and historical societies; • Enable learners to evaluate the role of institutions in furthering both continuity and change; • Guide learner analysis of the extent to which groups and institutions meet individual needs and promote the common good in contemporary and historical settings; • Assist learners as they explain and apply ideas and modes of inquiry drawn from behavioral sciences in the examination of persistent issues and social problems.

1.6 POWER, AUTHORITY, AND GOVERNANCE Candidates in social studies should possess the knowledge, capabilities, and dispositions to organize and provide instruction at the appropriate school level for the study of Power, Authority, and Governance.	Candidates: • Enable learners to examine the rights and responsibilities of individuals in relation to their families, their social groups, their communities, and their nation; • Help students explain the purpose of government and how its powers are acquired, used, and justified; • Enable learners to examine issues involving the rights, roles, and status of individuals in relation to the general welfare; • Assist learners in describing the ways nations and organizations respond to forces of unity and diversity affecting order and security; • Enable learners to explain conditions, actions, and motivations that contribute to conflict and cooperation within and among nations; • Help learners analyze and explain governmental mechanisms to meet the needs and wants of citizens, regulate territory, manage conflict, and establish order and security; • Help learners identify and explain the basic features of the American political system, and identify leaders of the various levels and branches of government; • Challenge learners to apply concepts such as power, role, status, justice, democratic values, and influence to the examination of persistent issues and social problems; • Help learners explain how governments attempt to achieve their stated ideals at home and abroad.
1.7 PRODUCTION, DISTRIBUTION, AND CONSUMPTION Candidates in social studies should possess the knowledge, capabilities, and dispositions to organize and provide instruction at the appropriate school level for the study of Production, Distribution, and Consumption of goods and services.	Candidates: • Enable learners to understand how the scarcity of productive resources (human, capital, technological, and natural) requires the development of economic systems to make • decisions about how goods and services are to be produced and distributed; • Help learners analyze the role that supply and demand, prices, incentives, and profits play in determining what is produced and distributed in a competitive market system; • Help learners compare the costs and benefits to society of allocating goods and services • through private and public means; • Assist learners in understanding the relationships among the various economic institutions that comprise economic systems such as households, businesses, financial institutions, government agencies, labor unions, and corporations; • Guide learners in analyzing the roles of specialization and exchange in economic processes; • Assist learners in assessing how values and beliefs influence economic decisions in different societies; • Enable learners to compare economic systems according to how they deal with demand, supply, prices, the role of government, banks, labor and labor unions, savings and investments, and capital;

	• Challenge learners to apply economic concepts and reasoning when evaluating historical and contemporary social developments and issues; • Enable learners to distinguish between domestic and global economic systems, and explain how the two interact; • Guide learners in the application of economic concepts and principles in the analysis of public issues such as the allocation of health care and the consumption of energy, and in devising economic plans for accomplishing socially desirable outcomes related to such issues; • Help learners critically examine the values and assumptions underlying the theories and models of economics; • Help learners distinguish between economics as a field of inquiry and the economy.
1.8 SCIENCE, TECHNOLOGY, AND SOCIETY Candidates in social studies should possess the knowledge, capabilities, and dispositions to organize and provide instruction at the appropriate school level for the study of Science, Technology, and Society.	Candidates: • Enable learners to identify, describe, and examine both current and historical examples of the interaction and interdependence of science, technology, and society in a variety of cultural settings; • Assist learners in making judgments about how science and technology have transformed the physical world and human society as well as our understanding of time, space, place, and human-environment interactions; • Help learners analyze the way in which science and technology influence core societal values, beliefs, and attitudes and how societal attitudes influence scientific and technological endeavors; • Prompt learners to evaluate various policies proposed to deal with social changes resulting from new technologies; • Help learners identify and interpret various perspectives about human societies and the physical world, using scientific knowledge, technologies, and an understanding of ethical standards of this and other cultures; • Encourage learners to formulate strategies and develop policy proposals pertaining to science/technology/society issues.
1.9 GLOBAL CONNECTIONS Candidates in social studies should possess the knowledge, capabilities, and dispositions to organize and provide instruction at the appropriate school level for the study of Global Connections and Interdependence.	Candidates: • Enable learners to explain how interactions among people with different languages, beliefs can facilitate global understanding or cause misunderstanding; • Help learners explain conditions and motivations that contribute to conflict, cooperation, and interdependence among groups, societies, and nations; • Assist learners in analyzing and evaluating the effects of changing technologies on the global community; • Challenge learners to analyze the causes, consequences, and possible solutions to persistent, contemporary, and emerging global issues, such as those pertaining to human health, security, resource allocation, economic development, and environmental quality; • Guide learner analysis of the relationships and tensions between national sovereignty and global interests in such matters as territorial disputes, economic development, weapons

	deployment, use of natural resources, and human rights concerns; • Help learners analyze or formulate policy statements that demonstrate an understanding of concerns, standards, issues, and conflicts related to universal human rights; • Help learners describe and evaluate the role of international and multinational organizations in the global arena; • Have learners illustrate how behaviors and decisions of individuals and groups affect and are affected by global systems.
1.10 CIVIC IDEALS AND PRACTICES Candidates in social studies should possess the knowledge, capabilities, and dispositions to organize and provide instruction at the appropriate school level for the study of Civic Ideals and Practices.	Candidates: • Assist learners in understanding the meaning, origins, and continuing influence of key ideals of the democratic republican form of government, such as individual human dignity, liberty, justice, equality, general welfare, domestic peace, and the rule of law; • Guide learner efforts to identify, interpret, analyze, and evaluate sources and examples of citizens' rights and responsibilities; • Help learners locate, access, analyze, organize, synthesize, evaluate, and apply information about selected public issues — identifying, describing, and evaluating multiple points of view and taking reasoned positions on such issues; • Enable learners to practice forms of civic discussion and participation consistent with the ideals of citizenship in a democratic republic; • Help learners analyze and evaluate the influence of various forms of citizen action on public policy; • Prepare learners to analyze a variety of public policies and issues from the perspectives of formal and informal political actors; • Guide learners as they evaluate the effectiveness of public opinion in influencing and shaping public policy development and decision-making; • Encourage learner efforts to evaluate the degree to which public policies and citizen behaviors reflect or foster the stated ideals of a democratic republican form of government; • Help learners to construct reasoned policy statements and action plans to achieve goals related to issues of public concern; • Guide learner participation in civic/political activities to strengthen the "common good," based upon careful evaluation of possible options for citizen action.
Standard 2 - DISCIPLINARY STANDARD	
Elements	**Indicators**
2.1 HISTORY Candidates who are to be licensed to teach history at all school levels should possess the knowledge, capabilities, and dispositions to organize and provide instruction at the appropriate school level for the study of history.	Candidates: • Assist learners in utilizing chronological thinking so that they can distinguish between past, present, and future time; can place historical narratives in the proper chronological framework; can interpret data presented in time lines and can compare alternative models for periodization; • Enable learners to develop historical comprehension in order that they might reconstruct the literal meaning of a historical passage; identify the central questions addressed in historical narrative;

	draw upon data in historical maps, charts, and other graphic organizers; and draw upon visual, literary, or musical sources; • Guide learners in practicing skills of historical analysis and interpretation, such as compare and contrast, differentiate between historical facts and interpretations, consider multiple perspectives, analyze cause and effect relationships, compare competing historical narratives, recognize the tentative nature of historical interpretations, and hypothesize the influence of the past; • Help learners understand how historians study history; • Assist learners in developing historical research capabilities that enable them to formulate historical questions, obtain historical data, question historical data, identify the gaps in available records, place records in context, and construct sound historical interpretations; • Help learners identify issues and problems in the past, recognize factors contributing to such problems, identify and analyze alternative courses of action, formulate a position or course of action, and evaluate the implementation of that decision; • Assist learners in acquiring knowledge of historical content in United States history in order to ask large and searching questions that compare patterns of continuity and change in the history and values of the many peoples who have contributed to the development of the continent of North America; • Guide learners in acquiring knowledge of the history and values of diverse civilizations throughout the world, including those of the West, and in comparing patterns of continuity and change in different parts of the world; • Enable learners to develop historical understanding through the avenues of social, political, economic, and cultural history and the history of science and technology.
2.2 GEOGRAPHY Candidates who are to be licensed to teach geography at all school levels should possess the knowledge, capabilities, and dispositions to organize and provide instruction at the appropriate school level for the study of geography.	Candidates: • Help learners use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective; • Enable learners to use mental maps to organize information about people, places, and environments in a spatial context; • Assist learners to analyze the spatial information about people, places, and environments on Earth's surface; • Help learners to understand the physical and human characteristics of places; • Assist learners in developing the concept of regions as a means to interpret Earth's complexity; • Enable learners to understand how culture and experience influence people's perceptions of places and regions; • Help learners understand and analyze the physical processes that shape Earth's surface; • Challenge learners to consider the characteristics and spatial distribution of ecosystems on Earth's surface; • Guide learners in exploring the characteristics, distribution, and migration of human populations on Earth's surface;

	• Help learners understand and analyze the characteristics, distribution, and complexity of Earth's cultural mosaics; • Assist learner exploration of the patterns and networks of economic interdependence on Earth's surface; • Enable learners to describe the processes, patterns, and functions of human settlement; • Challenge learners to examine how the forces of cooperation and conflict among people influence the division and control of Earth's surface; • Help learners see how human actions modify the physical environment; • Enable learners to analyze how physical systems affect human systems; • Challenge learners to examine the changes that occur in the meaning, use, distribution, and importance of resources; • Help learners apply geography to interpret the past and present and to plan for the future; • Enhance learners' abilities to ask questions and to acquire, organize, and analyze geographic information so they can answer geographic questions as they engage in the study of substantive geographic content.
2.3 CIVICS AND GOVERNMENT Candidates who are to be licensed to teach civics and/or government at all school levels should possess the knowledge, capabilities, and dispositions to organize and provide instruction at the appropriate school level for the study of civics and government.	Candidates: • Assist learners in developing an understanding of civic life, politics, and government so that the learners can explain the origins of governmental authority, recognize the need for government, and identify the crucial functions of government, including laws and rules; • Enable learners to evaluate rules and laws, differentiate between limited and unlimited government, and justify the need for limitations on governmental power; • Guide learners as they explore American democracy, including the American idea of constitutional government, the impact of the distinctive characteristics of American society on our government, the nature of the American political culture, and the values and principles that are basic to American life and government; • Help learners understand how the government of the United States operates under the Constitution and the purposes, values, and principles of American democracy, including the ideas of distributed, shared, and limited powers of government; how the national, state, and local governments are organized; and the place of law in the system; • Enable learners to understand the relationship of the United States to other nations and to world affairs; • Assist learners in developing an understanding of citizenship, its rights and responsibilities, and in developing their abilities and dispositions to participate effectively in civic life; • Insure that learners are made aware of the full range of opportunities to participate as citizens in the American democracy and of their responsibilities for doing so.

2.4 ECONOMICS Candidates who are to be licensed to teach economics at all school levels should possess the knowledge, capabilities, and dispositions to organize and provide instruction at the appropriate school level for the study of economics.	Candidates should know and demonstrate an in-depth understanding of the following concepts: • Productive resources are limited. Therefore, people cannot have all the goods and services that they want; as a result, they must choose some things and give up others. • Effective decision making requires comparing the additional costs of alternatives with the additional benefits. Most choices involve doing a little more or a little less of something; few choices are all or nothing decisions. • Different methods can be used to allocate goods and services. People, acting individually or collectively through government, must choose which methods to use to allocate different kinds of goods and services. • People respond predictably to positive and negative incentives. • Voluntary exchange occurs only when all parties expect to gain. This is true for trade among individuals or organizations within a nation, or among individuals or organizations in different nations. • When individuals, regions, and nations specialize in what they can produce at the lowest cost and then trade with others, both production and consumption increase. • Markets exist when buyers and sellers interact. This interaction determines market prices and thereby allocates scarce goods and services. • Prices send signals and provide incentives to buyers and sellers. When supply and demand change, market prices adjust, affecting incentives. • Competition among sellers lowers costs and prices, encouraging producers to produce more of what consumers are willing and able to buy. Competition among buyers increases prices and allocates goods and services to those people who are willing and able to pay the most for them. • Institutions evolve in market economies to help individuals and groups accomplish their goals. Banks, labor unions, corporations, legal systems, and not-for-profit organizations are examples of important institutions. • Money makes it easier to trade, borrow, save, invest, and compare the value of goods and services. • Interest rates, adjusted for inflation, rise and fall to balance the amount saved with the amount borrowed, thus affecting the allocation of scarce resources between present and future users. • Income for most people is determined by the market value of the productive resources they sell. What workers earn depends, primarily, on the market value of what they produce and how productive they are. • Entrepreneurs are people who take the risks of organizing productive resources to • make goods and services. Profit is an important incentive that leads entrepreneurs to • accept the risks of business failure. • Investment in factories, machinery, and new technology, and in the health, education,

	• and training of people can raise future standards of living. • There is an economic role for government to play in a market economy whenever the benefits of a government policy outweigh its costs. Governments often provide for national defense, address environmental concerns, define and protect property rights, and attempt to make markets more competitive. Most government policies also redistribute income. • Costs of government policies sometimes exceed benefits. This may occur because of incentives facing voters, government officials, and government employees; because of actions by special interest groups that can impose costs on the general public; or because social goals other than economic efficiency are being pursued. • Cost and benefit analysis is complex and involves placing value in both tangible and intangible factors when making policy decisions. • A nation's overall levels of income, employment, and prices are determined by the interaction of spending and production decisions made by all households, firms, government agencies, and others in the economy. • Unemployment imposes significant personal costs on individuals and families. It can also place a heavy burden on governments. Unexpected inflation imposes costs on many people and benefits some others because it arbitrarily redistributes purchasing • power. • In the United States, federal government budgetary policy and the Federal Reserve System's monetary policy influence the overall levels of employment, output, and prices. • The assumptions and values on which economic theory and public policy are based require careful analysis.
2.5 PSYCHOLOGY Candidates who are to be licensed to teach psychology at all school levels should possess the knowledge, capabilities, and dispositions to organize and provide instruction at the appropriate school level for the study of psychology.	Candidates: • Assist learners in comprehending and applying concepts, theories, and principles associated with human perception and cognition; emotional, social, and personal development; and growth and change; • Help learners understand human thinking, memory, perception, learning, development, and behavior; • Assist learners in comprehending factors associated with human adjustment and coping behaviors in various situations, during different stages of life, and in respect to particular personal and environmental situations; • Help learners consider how such factors as memory, thinking, beliefs, emotions, personality, perceptions, attitude, and abilities affect people's decisions and actions at any particular moment; • Enable learners to examine factors associated with the construction, revision, and use of self-concepts and identity and how these may affect an individual's thinking, feelings, decisions, and actions toward self, others, and the world; • Assist learner examination of factors that may have contributed to their own self-concepts and identity, including how their family, groups, peers, and communities may have been among

	those factors; • Enable learners to examine and comprehend factors associated with personality and individual differences and how personality and individual differences may be described, classified, assessed, and interpreted; • Assist learners to examine, comprehend, and apply ideas associated with mental and emotional health as well as psychological disorders, including factors contributing to such disorders and their treatment; • Enable learners to understand interconnections between themselves and particular situations, places, time, events, and social/cultural environments and systems that may influence them as well as be influenced by them; • Insure that learners comprehend, consider the advantages and disadvantages of, and apply concepts, principles, and procedures for conducting, monitoring, and interpreting psychological research activities; • Insure that learners understand and can apply the codes of ethics accepted by psychologists regarding the conduct of research on human and animal subjects and the reporting of research findings; • Enable students to engage in preliminary behavioral science research, using various research paradigms and perspectives.
Standard 3 - PEDAGOGICAL STANDARDS Due to the complexity and the interdisciplinary nature of the social studies, candidate needs are best met when their experiences include the following.	
Elements	**Indicators**
3.1 COURSE OR COURSES ON TEACHING SOCIAL STUDIES Institutions preparing social studies teachers should provide and require prospective social studies teachers to complete a course or courses that focus on the pedagogical content knowledge that deals specifically with the nature of the social studies and with ideas, strategies, and techniques for teaching social studies at the appropriate licensure level.	Instruction should: • Be specific to the teaching of social studies and the disciplines from which social studies content is drawn; • Engage teacher candidates in an analysis of the purposes of social studies, how to select content appropriate to those purposes, and how to assess student learning in terms of social studies goals. • Enable teacher candidates to select, integrate, and translate the content and methods of investigation of history and the social science disciplines for use in social studies instruction; • Prepare teacher candidates to use a variety of approaches to instruction that are appropriate to the nature of social studies content and goals and to use them in diverse settings and with students with diverse backgrounds, interests, and abilities; • Be taught by instructors whose professional experience and education through the graduate level is appropriate both to the content and goals of social studies and to the level of licensure.

3.2 QUALIFIED SOCIAL STUDIES FACULTY Institutions preparing social studies teachers should provide faculty who are recognized as (a) exemplary teachers, (b) scholars in the fields of social studies and social studies education, and (c) informed about middle and secondary school classrooms and teaching.	The faculty should: • Demonstrate teaching that models exemplary practice for their teacher candidate students; • Include those who have had successful middle or secondary school teaching experience in social studies as well as continuing close relationships with these schools; • Include social studies education specialists who comparably qualified for their social studies education roles.

Special Education (Non-Categorical)

Institutions and Organizations seeking State Approval for programs that prepare and result in the recommendation of candidates for licensure as teachers of Special Education shall be required to demonstrate that they meet the following program standards. The standards below are an adapted version of the 2003 Standards of Council of Exception Children for the preparation of Special Education Teachers.

Standard 1. Foundations
Indicators
Candidates understand: • The field as an evolving and changing discipline based on philosophies, evidence-based principles and theories, relevant laws and policies, diverse and historical points of view, and human issues that have historically influenced and continue to influence the field of special education and the education and treatment of individuals with exceptional needs both in school and society. • How these issues influence professional practice, including assessment, instructional planning, implementation, and program evaluation. • How issues of human diversity can impact families, cultures, and schools, and how these complex human issues can interact with issues in the delivery of special education services. • The relationships of organizations of special education to the organizations and functions of schools, school systems, and other agencies. Special educators use this knowledge as a ground upon which to construct their own personal understandings and philosophies of special education.
Standard 2: Development and Characteristics of Learners
Indicators
Candidates: • Know and demonstrate respect for their students first as unique human beings. • Understand the similarities and differences in human development and the characteristics between and among individuals with and without exceptional learning needs (ELN). • Understand how exceptional conditions can interact with the domains of human development and they use this knowledge to respond to the varying abilities and behaviors of individual's with ELN. • Understand how the experiences of individuals with ELN can impact families, as well as the individual's ability to learn, interact socially, and live as fulfilled contributing members of the community.
Standard 3: Individual Learning Differences
Indicators
Candidates : • Understand the effects that an exceptional condition can have on an individual's learning in school and throughout life. • Understand that the beliefs, traditions, and values across and within cultures can affect relationships among and between students, their families, and the school community. • Are active and resourceful in seeking to understand how primary language, culture, and familial backgrounds interact with the individual's exceptional condition to impact the individual's academic and social abilities, attitudes, values, interests, and career options. • Be able to individualize instruction to provide meaningful and challenging learning for individuals with ELN.

Standard 4: Instructional Strategies
Indicators
Candidates: • Posses a repertoire of evidence-based instructional strategies to individualize instruction for individuals with ELN. • Select, adapt, and use these instructional strategies to promote challenging learning results in general and special curricula and to appropriately modify learning environments for individuals with ELN. • Enhance the learning of critical thinking, problem solving, and performance skills of individuals with ELN, and increase their self-awareness, self-management, self-control, self-reliance, and self-esteem. • Emphasize the development, maintenance, and generalization of knowledge and skills across environments, settings, and the lifespan.
Standard 5: Learning Environments and Social Interactions
Indicators
Candidates: • Actively create learning environments for individuals with ELN that foster cultural understanding, safety and emotional well being, positive social interactions, and active engagement of individuals with ELN. • Foster environments in which diversity is valued and individuals are taught to live harmoniously and productively in a culturally diverse world. • Shape environments to encourage the independence, self-motivation, self-direction, personal empowerment, and self-advocacy of individuals with ELN. • Help their general education colleagues integrate individuals with ELN in regular environments and engage them in meaningful learning activities and interactions. • Use direct motivational and instructional interventions with individuals with ELN to teach them to respond effectively to current expectations. • Safely intervene with individuals with ELN in crisis. Special educators coordinate all these efforts and provide guidance and direction to para-educators and others, such as classroom volunteers and tutors.
Standard 6: Language
Indicators
Candidates: • Understand typical and atypical language development and the ways in which exceptional conditions can interact with an individual's experience with and use of language. • Use individualized strategies to enhance language development and teach communication skills to individuals with ELN. • Are familiar with augmentative, alternative, and assistive technologies to support and enhance communication of individuals with exceptional needs. • Match their communication methods to an individual's language proficiency and cultural and linguistic differences. • Provide effective language models, and they use communication strategies and resources to facilitate understanding of subject matter for individuals with ELN whose primary language is not English.
Standard 7: Instructional Planning
Indicators
Candidates: • Recognize that Individualized decision-making and instruction is at the center of special education practice. • Develop long-range individualized instructional plans anchored in both general and special curricula. • Systematically translate these individualized plans into carefully selected shorter-range goals and objectives taking into consideration an individual's abilities and needs, the learning environment, and a myriad of cultural and linguistic factors.

- Create Individualized instructional plans which emphasize explicit modeling and efficient guided practice to assure acquisition and fluency through maintenance and generalization.
- Understand that these factors as well as the implications of an individual's exceptional condition, guides the special educator's selection, adaptation, and creation of materials, and the use of powerful instructional variables.
- Modify Instructional plans based on ongoing analysis of the individual's learning progress.
- Facilitate this instructional planning in a collaborative context including the individuals with exceptionalities, families, professional colleagues, and personnel from other agencies as appropriate.
- Develop a variety of individualized transition plans, such as transitions from preschool to elementary school and from secondary settings to a variety of postsecondary work and learning contexts.
- Are comfortable using appropriate technologies to support instructional planning and individualized instruction.

Standard 8: Assessment

Indicators

Candidates:

- Use multiple types of assessment information for a variety of educational decisions.
- Use the results of assessments to help identify exceptional learning needs and to develop and implement individualized instructional programs, as well as to adjust instruction in response to ongoing learning progress.
- Understand the legal policies and ethical principles of measurement and assessment related to referral, eligibility, program planning, instruction, and placement for individuals with ELN, including those from culturally and linguistically diverse backgrounds.
- Understand measurement theory and practices for addressing issues of validity, reliability, norms, bias, and interpretation of assessment results.
- Special educators understand the appropriate use and limitations of various types of assessments.
- Collaborate with families and other colleagues to assure non-biased, meaningful assessments and decision-making.
- Conduct formal and informal assessments of behavior, learning, achievement, and environments to design learning experiences that support the growth and development of individuals with ELN.
- Use assessment information to identify supports and adaptations required for individuals with ELN to access the general curriculum and to participate in school, system, and statewide assessment programs.
- Regularly monitor the progress of individuals with ELN in general and special curricula.
- Use appropriate technologies to support their assessments.

Standard 9: Professional and Ethical Practice

Indicators

Candidates:

- Are guided by the profession's ethical and professional practice standards.
- Practice in multiple roles and complex situations across wide age and developmental ranges.
- Give ongoing attention to legal matters along with serious professional and ethical considerations.
- Engage in professional activities and participate in learning communities that benefit individuals with ELN, their families, colleagues, and their own professional growth.
- View themselves as lifelong learners and regularly reflect on and adjust their practice.
- Are aware of how their own and others attitudes, behaviors, and ways of communicating can influence their practice.
- Understand that culture and language can interact with exceptionalities, and are sensitive to the many aspects of diversity of individuals with ELN and their families.
- Actively plan and engage in activities that foster their professional growth and keep them current with evidence-based best practices.
- Know their own limits of practice and practice within them.

Standard 10: Collaboration
Indicators
Candidates: • routinely and effectively collaborate with families, other educators, related service providers, and personnel from community agencies in culturally responsive ways. • assure that the needs of individuals with ELN are addressed throughout schooling. • embrace their special role as advocate for individuals with ELN. • promote and advocate the learning and well being of individuals with ELN across a wide range of settings and a range of different learning experiences. • are viewed as specialists by a myriad of people who actively seek their collaboration to effectively include and teach individuals with ELN. • are a resource to their colleagues in understanding the laws and policies relevant to Individuals with ELN. • use collaboration to facilitate the successful transitions of individuals with ELN across settings and services.