2nd DRAFT

PENNSYLVANIA STATEWIDE PROGRAM-TO-PROGRAM ARTICULATION AGREEMENT IN 4-8 EDUCATION

In accordance with Article XX-C of the Public School Code of 1949, institutions participating in Pennsylvania's statewide college credit transfer system agree to the following policies governing the transfer of credits from a participating associate-degree granting institution into a participating four-year college or university. This agreement specifically ensures that a student who successfully completes an Associate of Arts (AA) or Associate of Science (AS) degree in 4-8 Education or any AA or AS degree that incorporates the required competencies at a participating institution can transfer the full degree into a parallel bachelor degree program leading to certification in 4-8 Education at a participating institution.

In order for students to transfer the full associate degree into a parallel bachelor degree program at a participating bachelor degree institution, all of the following criteria must be met:

- Successful completion of an associate degree in 4-8 Education that includes all of the required major competencies identified in this Agreement.
- A minimum cumulative grade of B or better in the associate degree (equivalent of a 3.0 GPA on a 4.0 scale)
- Current clearances portfolio including PA Act 34 Criminal History Record Check (CHRC), Act 114 Federal Criminal History Record Fingerprint Card, Act 151 PA Child Abuse History Clearance, negative TB test results, and passing results from General Knowledge on the appropriate PA qualifying examinations.
    - Clearances must be current within one year.

See Appendix A: Program-to-Program Articulation Model for 4-8 Education and Appendix B: Required Education Program Acceptance Tasks.

It is therefore understood that students meeting these requirements will be considered by both the associate degree granting institution and the receiving bachelor degree institution to possess the knowledge, skills and abilities necessary for entry as a junior into a parallel bachelor degree program leading to certification in 4-8 Education.

Students studying 4-8 Education should be concerned primarily with the process of teaching and learning with emphasis on the specific cognition and development of middle level students. The Association for Middle Level Education (AMLE) provides professional guidelines for the 4-8 Education degree. These competencies from the Pennsylvania Department of Education (PDE) and AMLE have been accessed in designing a curriculum agreement that demonstrates students' understanding of the fundamentals of the middle-level grades and provides the necessary background for success in advanced coursework in the major.

To that end, the associate degree in 4-8 Education must meet competencies in:

- Philosophy of Middle Level Education with Field Experience;
- Cognition and Young Adolescent Development;
- Special Education/Inclusive Practices;
- English Language Learners (ELL); and
- Field Experiences.

Pennsylvania Department of Education 4-8 Program Specific Guidelines – from which these above five components originate – include the following candidate competencies, found in their entirety in **Appendix C** of this document:

- Middle level education philosophy, adolescent development, student transition, instructional strategies, technology and materials, classroom management and professionalism
- Content and pedagogy including English/language arts and reading, mathematics, science, and social studies
- Assessment skills including using data, monitoring and modifying interventions and instruction, using multiple developmentally appropriate assessments, implementing technology in student assessment measures, using multiple assessment strategies that effectively measure student mastery of curriculum in more than one way, and designing assessments that target academic standards and assessment anchor content in subject areas

Competencies also include Field Experiences, as well as Accommodations and Adaptations for Students with Disabilities in an Inclusive Setting and Meeting the Needs of English Language Learners, which are required of all instructional and educational specialist preparation programs, the latter two of which are required by January 1, 2011.

REQUIRED MAJOR-SPECIFIC CONTENT AREA

Under this Agreement, community college students are required to acquire 9 to 12 credits of Major-Specific Coursework. A fully transferable associate degree in the field of 4-8 Education must include certain competencies according to PDE and AMLE. Acquisition of these competencies will allow 4-8 Education majors to identify and solve problems specific to middle level teaching and learning. Competencies included within a course must be clearly documented in all internal and external references to course descriptions including in catalogs, course lists, syllabi, etc.

Individual institutions may determine how the competencies are met within the required coursework. For example, one institution may choose to embed the competencies in two 3-credit courses with two separate 1-credit laboratory courses, while another institution teaches the same competencies in three 3-credit courses that include hands-on activities. How an institution incorporates the competencies into the associate degree program does not affect the transferability of the associate degree under this Agreement in as much as all of the competencies are met.

This agreement requires that 4-8 Education students fulfill the following competencies through Major-Specific Content Area coursework, again, as determined by the individual institutions. Additionally, because the Pennsylvania State Board of Education adopted changes that affect all of Pennsylvania's instructional and educational specialist programs by requiring 9 college-level credits (or 270 hours or an equivalent combination thereof) for Adaptations and Accommodations for Diverse Students in Inclusive Settings and 3 credits (or 90 hours or equivalent combination thereof) to meet the Instructional Needs of English Language Learners, it is highly recommended that 4-8 Education programs include up to 3 credits of coursework each in ELL Teaching English Language Learners and Adaptations and Accommodations for Diverse Students in Inclusive Settings.

Further, it is also recommended that 4-8 Education programs also include up to 3 credits (or 90 embedded hours) of Technology in required credit coursework since Technology is interwoven into *all* of the 4-8 competencies. Also recommended are 40 of the 190 required credit hours of field experience, to be embedded within the required courses as per institutional preference.

Competency to be Addressed	Course Credit Recommendation
I.A. Philosophy of Middle Level Education	3 cr
I.B. Adolescent Development	3 cr
V. Effective Instructional Strategies for Students with Disabilities in Inclusive Settings	3 cr or 90 embedded hours*
I.-II. Meeting the Instructional Needs of English Language Learners	3 cr or 90 embedded hours*
Technology	3 cr or 90 embedded hours*
Field Experience: Stage 1: Observation and Stage 2: Exploration	40 embedded hours*
TOTAL	**15 cr OR 6 cr with:** • **90 embedded hours of Effective Instructional Strategies for Students with Disabilities in Inclusive Settings;** • **90 embedded hours of ELL Instructional Needs; and** • **90 embedded hours of Technology**

As previously noted, students are required to earn a minimum cumulative grade of B or better in the associates degree (equivalent of a 3.0 GPA on a 4.0 scale). **See Appendix A: Program-to-Program Articulation Model for 4-8 Education.**

*Embedded hours refer to hours incorporated into regular coursework in such a way that the embedded competency is explored through its connection to a particular course. Institutions may embed the recommended competency hours as they deem appropriate.

GENERAL CONTENT AREAS

REQUIRED General Content

Under this Agreement, a fully transferable associate degree in the field of 4-8 Education must include the following primary general content areas in order to assist students in achieving the Pennsylvania Academic Standards (22 Pa. Code § 4.12).

To review required competencies for the general content courses please see Appendix C.

Required General Content	Course Credit Recommendation
Writing	3 cr
Literature (Writing-Intensive General or Young Adolescent)	3 cr
Speaking & Listening	3 cr
Mathematics	6 cr
Science (Science & Technology, Environment & Ecology)	6-8 cr (two 3-credit courses or two 4-credit courses)
Social Studies (History, Geography, Civics & Economics, and Government)	3 cr
Psychology (General or Adolescent/Cognition)	3 cr
TOTAL	**27 cr OR 29 cr (if science courses are 4-credits each)**

OPTIONAL General Content

Students *must* complete a minimum of 12-credit hours of general coursework in each of the four academic content areas (reading/language arts, math, science, social studies). Students must complete a total of 30 credits of concentrated coursework in *one* of the four areas *or* 21-credits in *two* of the four areas. As per the 4-8 Program Specific Guidelines, students who choose two 21-credit concentrations must include math or science as one of the two areas..

If community college students are certain of the academic content area in which they would like to focus, they could take 15-21 or 15-30 hours in the select content area(s). Course content must be aligned with Pennsylvania's academic standards and recommendations for essential middle level teacher content knowledge, pedagogical content knowledge, teaching skills, and clinical experience – all of which have been advised by professional associations relevant to each discipline and intended to promote academic achievement and connected networks of knowledge within and among those disciplines.

Courses with the following content and competencies should be listed as options, with community college advisors directing students based on their individual interests and on the program policies of the four-year institution in which students intend to enroll.

Optional Content Area Recommendation	Course Credit Recommendation
Government	3 cr
Geography	3 cr
Physical Science, Life Science, Earth and Space Science Investigations, and Numeracy Skills in Teaching Science	6-8 cr (two 3-credit courses or two 4-credit courses)
TOTAL	**12 cr (or 14 cr, if Sciences are 4-credits each)**

Institutions may determine how the competencies identified in these primary content areas are met. For example, one institution may choose to embed the Lab Science competencies in four 3-credit courses, while another institution may teach the same competencies in three 4-credit courses. How an institution incorporates the competencies into the associate degree program does not affect the transferability of the degree under this Agreement in so long as all of the competencies are met.

Additionally, it is an institutional responsibility for the advising that takes place at both the community college and 4-year level. Furthermore, student advisors at the community college should be in communication with the appropriate advisors at the 4-year institution for clarification of transfer concerns.

The Pennsylvania Department of Education 4-8 Program Specific Guidelines do not address arts and humanities, health and wellness, or information literacy in the standards and competencies. However, while some four-year institutions may include these skills as required components of their core curriculum, it is essential to note that the concepts of these disciplines are crucial to encouraging students' development of critical and creative thinking, problem solving, and performance skills.

Further, the knowledge gained through an exploration of arts and humanities, health and wellness, and information literacy enhances the learning atmosphere by challenging students to understand and interpret our world meaningfully and experience and appreciate multiple perspectives of expression.

Therefore, while there are no requirements mandated by the articulation agreement, it is strongly recommended that arts and humanities, health and wellness, and information literacy – along with technology, multicultural appreciation, and writing across the curriculum – be integrated into multiple major courses as each individual institution deems relevant and appropriate.

As a reminder, students are required to earn a minimum cumulative grade of B or better in the associate's degree (equivalent of a 3.0 GPA on a 4.0 scale).

See Appendix A: Program-to-Program Articulation Model for 4-8 Education.

REQUIRED SPECIFIC CONCENTRATION CONTENT AREAS

All students wishing to enter the middle level teacher program will meet the aforementioned competencies in professional education plus complete coursework that addresses the subject matter content and pedagogy competencies in at least one of the following areas of concentration:

A. **English/Language Arts and Reading – 9 credits**
B. **Mathematics – 9 credits**
C. **Science – 12 credits**
D. **Social Studies – 9 credits**

Dual concentration options may be pursued at the four-year institution. Students should be advised that foundational coursework is necessary and that to be certified to teach at the middle grade level they must take a 21- or 30-credit focus and pass the appropriate test(s).

Herein, candidate competencies for subject matter content and pedagogy are provided succinctly. The reader is referred to the PDE 4-8 Program Articulation Guidelines relating to those specific content areas (e.g., Mathematics) or to **Appendix C** of this document for more detailed descriptions.

As with Major Specific Content Areas, institutions may determine how the competencies identified in these Specific Concentration Content Areas are met. How an institution incorporates the competencies into the associate degree program does not affect the transferability of the degree under this Agreement in so long as all of the competencies are met.

In all Concentrations, students are advised to work closely with an advisor, the 4-8 Education Coordinator, and a transfer counselor to select appropriate courses related to their associate degree program, transfer-major, and personal interests. Contact should be made with an advisor, the 4-8 Education Coordinator, and a transfer counselor at the expected four-year institution as soon as possible during associate's degree coursework to ensure that the four-year institution's general education requirements are appropriately woven into the student's associate degree curriculum.

1. **English/Language Arts and Reading Concentration – 9 credits**
   Students selecting the English/Language Arts and Reading Concentration must complete associate degree level coursework with competencies in the following subject matter content and pedagogy:
   - Foundations in research
   - Word level instruction
   - Text level comprehension
   - Reading-writing connection
   - Communication
   - Assessment in literacy

   Of the 9 credits earned within this concentration, 3 credits should reflect writing and writing-intensive English/literature, 3 should reflect literature, and 3 credits should reflect literacy competencies.

2. **Mathematics Concentration – 9 Credits**
   Students selecting the Mathematics Concentration must complete associate degree level coursework with competencies in the following subject matter content and pedagogy:
   - Develop, implement, assess, and modify curriculum and lessons based on factual, conceptual, strategic, procedural, and attitudinal mathematical knowledge
   - Numbers and operations
   - Algebra and functions
   - Geometry and measurement
   - Data analysis, statistics, probability
   - Calculus concepts and applications

- Mathematical modeling and applications of mathematical understandings

Of the 9 credits earned within this concentration, 3 credits should reflect coursework that meets the competency of Develop, implement, assess, and modify curriculum and lessons based on factual, conceptual, strategic, procedural, and attitudinal mathematical knowledge, and 6 should reflect coursework that meets either the algebra and functions; geometry and measurement; or calculus concepts and applications competencies.

3. **Science Concentration – 12 credits**
Students selecting the Science Concentration must complete associate degree level coursework with competencies in the following subject matter content and pedagogy:
- Develop, implement, assess, and modify curriculum and lessons based on factual, conceptual, strategic, procedural, and attitudinal science knowledge
- Ecology standards
- Physical sciences
- Life sciences
- Earth and space sciences
- Science and inquiry

Of the 12 credits earned within this concentration, 6 credits should reflect laboratory science coursework. Please note that students in the Science Concentration must complete one course in each of the four science areas listed above to meet the required 12-credit focus.

4. **Social Studies Concentration – 9 credits**
Students selecting the Social Studies Concentration must complete associate degree level coursework with competencies in the following subject matter content and pedagogy:
- Develop, implement, assess, and modify curriculum and lessons based on principles and standards that demonstrate the study of culture; time; people, places, and environments; individuals, groups, and institutions; power, authority, and governance; production, distribution, and consumption; science, technology, and society, global connections; and civic ideals and practices
- Geographic literacy
- Research and history
- Economics
- Government and citizenship

Of the 9 credits earned within this concentration, 3 should reflect coursework that meets the geographic literary competency, 3 should reflect coursework that meets the global connections competency, and 3 should reflect coursework that meets the government competency.

REQUIRED FIELD EXPERIENCE

Pennsylvania Department of Education requires all education students to obtain 190 hours of pre-student teacher field experience. In order to fulfill this requirement, it is recommended that 10 hours of field experience be included as an integral part of all education courses. This enables students to immediately apply the knowledge gathered in each course to their observations and periphery participation in the field.

Level 1: Observation
Candidates are observers in a variety of education and education related settings (e.g., community organizations, tutoring programs). Programs are expected to design this phase so that candidates participate before formal admission to the teacher education program. Apart from community and after-school programs, there must be a range of school and classroom experiences (e.g., urban, suburban, rural; high- and low-performing schools)—all taking place in middle level grades—so that candidates have

a broad experience and learn as much as possible about middle level learners and middle level education philosophy.

Level 2: Exploration
This stage may be called the "assistant" phase of field experience—it is where the candidate works under a certified teacher's direction with a small group of students. Activities could include tutoring, helping with reading assignments, and so forth. Ideally, this stage would also occur before admission to the teacher preparation program.

REQUIRED CLEARANCES PORTFOLIO
Prior to transferring to a bachelor degree institutions, students must provide proof of the following clearances, completed from within one year:

- PA Act 34 Criminal History Record Check (CHRC)
- Act 114 Federal Criminal History Record Fingerprint Card
- Act 151 PA Child Abuse History Clearance

In addition, students must provide proof of negative TB test results and passing results from the appropriate required exams.

See Appendix B: Required Education Program Acceptance Tasks for more details.

Appendix A: Program-To-Program Articulation Agreement for 4-8 Education

REQUIRED MAJOR-SPECIFIC CONTENT	REQUIRED GENERAL CONTENT	REQUIRED SPECIFIC CONCENTRATION CONTENT AREA: English/Language Arts and Reading	REQUIRED SPECIFIC CONCENTRATION CONTENT AREA: Mathematics	REQUIRED SPECIFIC CONCENTRATION CONTENT AREA: Science	REQUIRED SPECIFIC CONCENTRATION CONTENT AREA: Social Studies
6 credits including: 1. Philosophy of Middle Level Education 3 cr. 2. Adolescent Development 3 cr. **Together with:** • *90 embedded hours of Effective Instructional Strategies for Students with Disabilities in Inclusive Settings;* • *90 embedded hours of ELL Instructional Needs; and* • *90 embedded hours of Technology* **OR 15 credits including:** 1. Philosophy of Middle Level Education 3 cr. 2. Adolescent Development 3 cr. 3. Effective Instructional Strategies for Students with Disabilities in Inclusive Settings 3 cr. 4. Meeting the Instructional Needs of English Language Learners 3 cr. 5. Technology 3 cr.	**27 credits** (OR 29 **IF** science courses are 4-credits each) **including:** 1. Writing 3 cr. 2. Literature (Writing-Intensive General or Young Adolescent) 3 cr. 3. Speaking & Listening 3 cr. 4. Mathematics 6 cr. 5. Science (Science & Technology, Environment & Ecology) 6-8 cr. (two 3 credit courses or two 4-credit courses) 6. Social Studies 3 cr. (History, Geography, Civics & Economics, and Government) 7. Psychology 3 cr. (General or Adolescent/Cognition)	**9 credits including:** 1. Writing or writing-intensive English/literature coursework 3 cr. 2. Literature 3 cr. 3. Literacy 3 cr.	**9 credits including:** 1. Develop, implement, assess, and modify curriculum and lessons based on factual, conceptual, strategic, procedural, and attitudinal mathematical knowledge 3 cr. 2. Algebra and functions; geometry and measurement; **OR** calculus concepts and applications competencies 6 cr.	**12 credits including:** 1. One course in <u>each of the four science areas 12 cr.</u> • Of which: Laboratory science is 6 cr.	**9 credits including:** 1. Geographic literary 3 cr. 2. Global connections 3 cr. 3. Government 3 cr.

Appendix B: Required Education Program and University College/School of Education Acceptance Tasks

Required Education Program Acceptance Tasks
• Completion of Associates Degree
• Negative TB test results
• Pennsylvania Background Check (Act 34)
• Pennsylvania Child Abuse History Clearance (Act 151)
• Fingerprint-based FBI record check (Act 114)
To Maintain Acceptance in Education Program
• Minimum cumulative grade of B or better in the associates degree (equivalent of a 3.0 GPA on a 4.0 scale)
• Obtain current Pennsylvania qualifying/passing scores for the appropriate PA qualifying examinations. Qualifying scores established by Pennsylvania Secretary of Education (See www.teaching.state.pa.us/teaching/ and choose "Testing Requirements")
• Documentation of (40 hours) Level I and II Field Experience within each course
• Maintenance of clearances current to within one year and as per individual institutional Code of Conduct policies (Certificate of No Offense)

Appendix C: Candidate Competencies

The following list is taken directly from the Pennsylvania Department of Education Framework for Grades 4-8 Program Guidelines. This section outlines the competencies required for certification by Chapter 354: "The preparing institution shall ensure that candidates complete a well planned sequence of professional educator courses and field experiences to develop an understanding of the structure, skills, core concepts, facts, methods of inquiry and application of technology related to each academic discipline the candidates plan to teach or in the academic disciplines related to the non-instructional certificate categories in which they plan to serve." (22 Pa. Code §354.25(b) (3)).

I. Middle Level Education
Candidates will demonstrate their ability and understanding of:

A. Philosophy of middle school education

1. Believe that all young adolescents can learn and accept responsibility to help them do so;
2. Hold high, realistic expectations for the learning and behavior of all young adolescents;
3. Implement the middle level curriculum;
4. Distinguish the rationale and characteristic components of developmentally responsive middle level schools;
5. Translate the implications of young adolescent development in the context of the school organization and components of successful middle level programs and schools;
6. Assist and be supportive of all young adolescents developing to their full potential;
7. Implement the philosophical foundations of developmentally responsive middle level programs and schools;
8. Participate fully in the team process as a structure for school improvement and student learning.

B. Adolescent development

1. Recognize and implement the major concepts, principles, theories, and research related to young adolescent development;
2. Identify the range of individual differences of all young adolescents and the implications of these differences for teaching and learning;
3. Describe issues of young adolescent health and sexuality;
4. Identify how the development of all young adolescents occurs in the context of classrooms, families, peer groups, communities and society;
5. Respect and appreciate the range of individual developmental differences of all young adolescents;
6. Utilize student assistance and student support programs that attend to the social and emotional needs of young adolescents.

C. Student transition

1. Design and implement strategies that provide students with appropriate skills in making the transition from an elementary school environment to the middle school environment and then to the high school environment;
2. Develop supports for students moving to an environment with multiple teachers, changing classrooms and required course decisions;
3. Recognize and plan for supporting student adjustment to the changing relationships with teachers and the impact of peer pressure;
4. Incorporate knowledge of adolescent development into educating students in goal setting and decision making;

D. Instructional strategies

1. Employ teaching/learning strategies that take into consideration and capitalize upon the developmental characteristics of all young adolescents;
2. Create positive, productive learning environments where developmental differences are respected and supported, and individual potential is encouraged;

3. Create learning opportunities that reflect an understanding of the development of al young adolescent learners;
4. Engage young adolescents in activities related to their interpersonal, community, and societal responsibilities;
5. Deliver curriculum that is relevant, challenging, integrative, and exploratory;
6. Make connections among subject areas when planning and delivering curriculum;
7. Incorporate young adolescents' ideas, interests, and experiences into instruction;
8. Use direct and explicit comprehension instruction;
9. Use effective instructional principles explicitly in course content;
10. Motivate students within the context of each subject;
11. Design successful interventions responsive to the needs of individual middle level students;
12. Strategically tutor students whose assessments indicate the need for additional instruction.

E. Technology and materials

1. Incorporate technology into instruction on a regular and frequent basis;
2. Use materials designed explicitly for middle level grades;
3. Engage students with instructional text to support teaching in specific subjects;
4. Utilize children's and young adult literature, classic texts in different genres, commercial reading series, electronic-based information and locally created materials;
5. Make decisions about curriculum and resources that reflect an understanding of young adolescent development;
6. Integrate technology in curriculum planning and in lesson delivery;
7. Assess and select curriculum materials that are academically challenging and personally motivating for young adolescents;
8. Integrate a range of technologies in curriculum, instruction, and assessment;
9. Use appropriate technology during instruction to enhance the understanding of subject matter.

F. Classroom management

1. Create and maintain supportive learning environments that promote the healthy development of all young adolescents;
2. Demonstrate effective adolescent behavior strategies for the classroom;
3. Use appropriate organizational techniques for the classroom;

G. Professionalism

1. Act as positive role models, coaches, and mentors for all young adolescents;
2. Communicate deep content knowledge in subjects taught;
3. Serve on advisory program, co-curricular activities and other programs supporting the curriculum;
4. Uphold high professional standards;
5. Interact with various professionals that serve young adolescents (e.g., school counselors, social service workers, home-school coordinators);
6. Participate fully in teaming and collaborative grade and building level structures;
7. Utilize research/data-based decision-making.

II. Subject Matter Content and Pedagogy
Candidates will be able to:

A. English/Language arts and reading

1. Foundations in Research
    a. Demonstrate expertise in language and reading development;
    b. Implement foundational knowledge from current literacy research;
    c. Provide effective instruction in word-level strategies that result in student literacy gains;
    d. Demonstrate an understanding of the relationship between decoding and comprehension in reading instruction, critical literacy knowledge and skills in decoding;
    e. Implement effective instructional principles embedded in content, including language arts teachers using content-area texts and content-area teachers providing instruction and practice in reading and writing skills specific to their subject area;
    f. Demonstrate concepts, knowledge, and skills essential for direct and explicit reading instruction, particularly in comprehension;
2. Word Level Instruction
    a. Provide phonemic awareness and phonics instruction for students who struggle in decoding;
    b. Provide instruction in deep syntax, semantics, morphology and speaking in vocabulary development;
2. Text Level Comprehension
    a. Explicitly address comprehension instruction directly to academic anchors and standards, conduct assessment and design appropriate interventions;
    b. Provide instruction in vocabulary and text comprehension;
    c. Provide direct explicit comprehension instruction in the strategies proficient readers use to understand what they read, e.g., summarizing, monitoring one's own comprehension;
    d. Implement text-based collaborative learning, which involves students interacting with one another around a variety of texts;
    e. Demonstrate proficiency with strategic tutoring, which provides students with intense individualized reading, writing, and content instruction based on assessment;
    f. Provide instruction from multiple sources of diverse texts, which are texts at a variety of difficulty levels and on a variety of topics;
3. Reading-Writing Connection
    a. Develop effective skills in writing;
    b. Provide intensive writing instruction including instruction connected to the kinds of writing tasks students will have to perform well in high school and beyond;
    c. Supply prompts that support thinking;
    d. Develop ideas in writing that go beyond the superficial;
    e. Direct instruction in reading strategies for the content areas;
    f. Use content-area texts and content-area instruction and practice in reading and writing skills specific to subject areas;
    g. Make overt connections between and across the curriculum, students' lives, literature, and literacy; Provide strategies for reading content;
    h. Provide rubrics that students review, use, and even develop;
3. Instructional Approaches and Materials
    a. Design models and guides that lead students to understand how to approach each task;
    b. Include technology as a tool for and a topic of literacy instruction, including using technology-based reading materials;
    c. Utilize a variety of text material at different difficulty levels and on a variety of topics;

d. Adapt and modify instruction, use technology appropriately, and adapt curriculum successfully;
e. Design follow-up lessons that cause students to move beyond their initial thinking.
f. Develop skills in listening;
g. Plan lessons that connect with each other, with test demands, and with students' growing knowledge and skills;

4. Assessment in Literacy
    a. Conduct ongoing, formative assessment of students, which is informal, and often daily assessment of how students are progressing under current instructional practices;
    b. Apply assessment skills, extensive practice, and the application of assessment results to design effective individualized interventions that are essential literacy teaching skills;
    c. Recognize students having difficulty in reading, writing and speaking, and assist in diagnosing their areas of need;
    d. Design and test the effectiveness of appropriate interventions;
    e. Translate diagnostic information about student learning into successful teaching strategies which require formal preparation.

B. Mathematics

1. Develop, implement, assess and modify curriculum and lessons as evidenced by their ability to teach students how to:
    a. Demonstrate factual knowledge needed to have students understand a mathematical problem or phenomenon;
    b. Demonstrate the conceptual knowledge necessary to enable a student to determine what kind of a math problem is presented through a coherent representation of the situation;
    c. Demonstrate strategic knowledge of the approaches needed to solve problems;
    d. Implement procedural knowledge (or computational skill) such as addition, subtraction, or solving equations;
    e. Model procedural skills that require teachers to have deep content knowledge in order to understand and apply mathematical concepts to a wide range of classroom learning situations and to help middle level students at all levels of ability and achievement to improve their knowledge of mathematics.
2. Numbers and Operations, Algebra and Functions—candidates will be able to develop, implement, assess and modify curriculum and lessons as evidenced by their ability to teach students how to:
    a. Illustrate the different roles numbers and operations play;
    b. Illustrate the structure of the rational number system and the real number system;
    c. Develop a deep understanding of rational numbers and operations on rational numbers;
    d. Teach the mathematics that underlies standard algorithms;
    e. Make sense of large and small numbers and use scientific notation;
    f. Demonstrate mastery in the different roles algebra plays as a study of patterns, as a symbolic language useful in many areas of life, and as a tool for problem solving;
    g. Develop a deep expertise of variables and functions;
    h. Represent physical situations symbolically:
    i. Graph linear, quadratic, exponential functions and their inverses;
    j. Solve linear and quadratic equations and inequalities;
    k. Exhibit fluency in working with symbols.
3. Geometry and Measurement—candidates will be able to develop, implement, assess and modify curriculum and lessons as evidenced by their ability to teach students how to:
    a. Represent the roles geometry and measurement play in middle level mathematics;
    b. Identify two- and three-dimensional shapes and know their properties;
    c. Develop spatial reasoning through physical and mental activities;
    d. Connect geometry to other mathematical topics;

e. Connect geometry to nature and to art;
f. Apply measurement processes;
g. Use measurement techniques and formulas proficiently.

4. Data Analysis, Statistics, and Probability—candidates will be able to develop, implement, assess and modify curriculum and lessons as evidenced by their ability to teach students how to:
    a. Operationalize and experience data analysis, probability and statistics in real world everyday applications;
    b. Design simple investigations and collect data (through random sampling or random assignment to treatments) to answer specific questions;
    c. Use a variety of ways to display data, including bar graphs and pie charts for categorical data, interpret and use histograms, line graphs, stem-and-leaf plots, and box plots for continuous data, and interpret and use scatter plots, regression lines, and correlations for bivariate data;
    d. Explore and interpret data by observing patterns and departures from patterns in data displays, with particular emphasis on shape, center, and spread;
    e. Anticipate patterns by studying, through theory and simulation, those produced by simple probability models;
    f. Draw conclusions with measures of uncertainty by applying basic concepts of probability;
    g. Demonstrate and provide examples about current uses of statistics and probability in fields relevant to middle level teaching and learning such as the sciences and social studies.
5. Calculus Concepts and Applications
    a. Demonstrate mastery of functions, including logarithmic, exponential, and trigonometric function;
    b. Apply data analysis and matrices;
    c. Introduce finite mathematics and discrete mathematics
6. Mathematical Modeling and Applications of Mathematical Understanding — candidates will be able to develop, implement, assess and modify curriculum and lessons as evidenced by their ability to teach students how to:
    a. Build new mathematical knowledge through problem solving, solve problems that arise in math and other discipline areas, and know how to apply appropriate strategies to solve these problems;
    b. Provide ways in which mathematics can be applied to a variety of real world situations;
    c. Use reasoning and proof successfully, make and investigate mathematical conjectures, develop and test arguments and proofs, and use various forms of reasoning in mathematics and related applied contexts;
    d. Make mathematical connections, enabling middle level students to recognize and use connections among ideas in mathematics, apply math in contexts outside of mathematics, and demonstrate their understanding of how mathematical ideas interconnect within and outside the discipline;
    e. Represent and apply representations of mathematical ideas, select and apply mathematical representations to solve problems, and use them to interpret phenomena from math, the sciences, and the social sciences; and
    f. Use technology in mathematics instruction and learning.

C. Science

1. Develop, implement, assess and modify curriculum and lessons as evidenced by their ability to:
    a. Demonstrate proficiency with science learning that requires curricula based on factual knowledge and conceptual development;
    b. Assist students to build on their natural curiosity to develop skills and knowledge in the sciences;
    c. Effectively assess each child's knowledge and conceptual skill development;

d. Adapt instructional goals to the existing knowledge and skills of the learners, as well as choose instructional techniques that will be the most effective;
e. Use and interpret scientific explanations of the natural world;
f. Generate and evaluate scientific evidence and explanations;
g. Understand the nature and development of scientific knowledge and participate productively in scientific practices and discourse;
h. Implement pedagogy for the concepts that students find most difficult, as well as ways to support their understanding of those concepts;
i. Use curriculum materials that are particularly effective for teaching specific topics;
j. Assess student knowledge in multiple ways;
k. Provide unifying themes incorporated into science content and methods to include concepts such as systems, models, patterns, scale, change, and the importance of evidence and measurement;
l. Implement research-based instruction to develop professional knowledge and skills in science and science teaching with a curriculum and management that reflects the importance of science teaching as an essential profession with its own specialized needs and functions;
m. Demonstrate proficiency with sufficient laboratory, computer technology, curriculum, and other resources to support the most effective teaching of science at a designated level of teaching specialization;
n. Develop descriptions, explanations, predictions, and models using evidence, recognizing and analyzing alternative explanations and predictions;
o. Use prior knowledge to pose problems and generate data rather than thinking about science as truths to be memorized;
p. Explicitly teach data collection, interpreting data, testing inferences, and the search for patterns in data;
q. Directly have students test ideas through experimentation;
r. Provide explanatory frameworks for students to study: systems, order, and organization; evidence, models and explanation; evolution and equilibrium; form and function;
s. Explain observations and test models against additional data and identify strengths and limitations of various explanatory models;
t. Use patterns in observations to develop explanations and predictions;
u. Develop causal models to explain patterns in observed or collected data;
v. Demonstrate scientific arguments and reasoning in order to make ideas public and learn to revise models in light of data that do not work;
w. Categorize conceptions and preconceptions of science and scientific knowledge;
x. Clarify misunderstandings of science and scientific inquiry processes;
y. Recognize student preconceptions, student reasoning patterns, problematic explanations for observed phenomena;
z. Promote conceptual change in student understanding of scientific knowledge and processes;

2. Standards – apply their knowledge of established local, Pennsylvania, and national standards (e.g., those published by the National Science Education Teachers Association, the PA Academic Standards, etc.) and incorporate those standards in their teaching:
   a. Unifying themes and processes in science;
   b. Science as inquiry;
   c. Physical science, chemistry and physics;
   d. Biological science;
   e. Earth and space science;
   f. Science and technology;
   g. Science in personal and social perspectives;
3. Ecology standards – understand and know Pennsylvania's grade 4 - 8 Academic Standards for Environment and Ecology including:
   a. Watersheds and wetlands;
   b. Renewable and non-renewable resources;

c. Environmental health;
d. Agriculture and society;
e. Integrated pest management;
f. Threatened, endangered and extinct species;
g. Humans and environment;
h. Environmental laws and regulations.

4. Physical sciences—demonstrate an understanding of the nature of science by specific applications to the physical sciences regarding:
   a. Forces and motion;
   b. Physical properties of matter;
   c. Chemical properties of matter;
   d. Energy and interactions between matter and energy (light, heat, electricity, magnetism, sound);
   e. Laboratory investigations in the physical sciences.
5. Life sciences—demonstrate an understanding the nature of science by specific applications to the life sciences regarding:
   a. Structure and function of living things (characteristics of organisms);
   b. Reproduction and heredity;
   c. Adaptation and evolution (organisms and their environments;
   d. Ecological behavior and systems (regulation and behavior);
   e. Relationships between organisms and the environment;
   f. Laboratory investigations in the life sciences.
6. Earth and space sciences—demonstrate an understanding of the nature of science, applied to earth and space sciences regarding:
   a. Structure and function of earth systems;
   b. Earth features and processes;
   c. Cycles in earth systems;
   d. Energy;
   e. Weather and climate;
   f. Solar system and the universe (objects in the sky, changes in the earth and sky);
   g. Investigations in the earth and space sciences.
7. Science and inquiry:
   a. Teach science as a process of inquiry;
   b. Illustrate the process of scientific inquiry by having students think critically and logically to make the relationships between evidence and explanations;
   c. Model how scientists "do science" in different disciplines, such as scientific inquiry and methods in the physical, life, earth, and space sciences; types of scientific investigations;
   d. Explore approaches to scientific reasoning and investigative strategies through learner-centered principles of instruction such as engaging students in activities or discussions;
   e. Demonstrate scientific reasoning through showing how scientists develop analyze, and test different explanations for their findings;
   f. Communicate scientific procedures and explanations by using the range of scientific investigations appropriate to a discipline and to a problem;
   g. Represent the historical development of science and the role of logical reasoning and verifiable evidence;
   h. Construct scientific arguments and present and defend results of a scientific investigation.

D. Social studies

1. Develop, implement, assess and modify curriculum and lessons as evidenced by their ability to apply the standards and thematic strands of social studies as identified by the National Council for the Social Studies (http://www.ncss.org/standards/) including:
   a. The study of culture;

   b. Time, continuity and change—helping students to know how to understand and reconstruct the past;
   c. People, places, and environments—giving students the perspective of a world beyond "their personal locations";
   d. Individual development and identity—affected by culture, groups, and by institutions;
   e. Individuals, groups, and institutions—knowledge about how institutions (social, economic, religious, governmental) are formed and operate;
   f. Power, authority, and governance—the historical development and functions of governmental institutions, the exercise of power, individual rights, and related concepts;
   g. Production, distribution, and consumption—focuses on the economy, production of goods and services, resource allocation, and labor, capital, and management;
   h. Science, technology, and society—deals with the development and use of technology, the pace of change and its impact on society, and promoting broader access to technology within and across societies;
   i. Global connections—theme of interdependence;
   j. Civic ideals and practices—described as topics, values, and issues related to citizenship, rights and responsibilities;
2. Principles – demonstrate implementation of the five overarching principles for social studies instruction:
   a. Social studies teaching and learning are powerful when they are meaningful;
   b. Social studies teaching and learning are powerful when they are integrated;
   c. Social studies teaching and learning are powerful when they are values-based;
   d. Social studies teaching and learning are powerful when they are challenging by expecting students to strive to accomplish the instructional goals, both as individuals and as group members;
   e. Social studies teaching and learning are powerful when the learning is active.
3. Standards –demonstrate the ability to incorporate into instructional planning the local, Pennsylvania, and national learning standards, grades 4 through grade 8, for social studies, specifically:
   a. Geography
   b. Basic geographic literacy
   c. Physical characteristics of places and regions
   d. Human characteristics of places and regions
   e. The interactions between places and people
   f. History
   g. Historical analysis and skills development
   h. Pennsylvania history
   i. United States history
   j. Economics
   k. Economic systems
   l. Markets and functions of governments
   m. Scarcity of choice
   n. Economic interdependence
   o. Work and earnings
   p. Civics and government
   q. Principles and documents of governments
   r. Rights and responsibilities of citizenship
   s. How governments work
4. Geography and world cultures – demonstrate proficiency in:
   a. Basic geographic literacy, including the ability to use geographic tools and knowledge of places and regions;
   b. Physical characteristics of places and regions, with attention to understanding the physical system and its properties;

c. Human characteristics of places and regions—including knowledge and understanding of population, culture, exploration and settlement, economic activity and political activity;
d. Interactions between people and places—how physical environments affect people, and how humans affect the places where they live and work.

5. Research and history:
   a. Equip students with tools to comprehend, interpret, and conduct historical research;
   b. Outline and delineate historical developments;
   c. Make effective use of inquiry and analysis tools (documents, web resources, analyses, as well as relevant subject matter in other disciplines such as economics, political science, and the natural sciences);
   d. Differentiate the contributions of individuals and groups;
   e. Use and understanding documents, artifacts, and the significance of historical places;
   f. Describe historical implications of continuity and change;
   g. Distinguish between conflict and cooperation among groups;
   h. Categorize the discipline of history with key concepts such as time, change, cause and causation, evidence;
   i. Interpret historical accounts.
6. Economics – demonstrate proficiency in representing, clarifying and imparting the basic understanding of:
   a. Economic systems;
   b. Markets;
   c. Economic interdependence;
   d. Economic aspects of work and earnings.
7. Government and citizenship:
   a. Represent, clarify and communicate the principles, structures, documents, and operation of government in a democratic society
      i. United States of America
      ii. Commonwealth of Pennsylvania;
   b. Represent, clarify and communicate the citizenship rights and responsibilities;
   c. Analyze relationships among nations and peoples;
   d. Clarify and analyze how government works, including the branches of government at the state and federal levels;
   e. Acquire knowledge and understanding international relations
      i. American foreign policy
      ii. The role of the United States in world affairs, and roles of international organizations.

III. Assessment Skills

A. Use assessment data to guide instruction;
B. Monitor the results of interventions and alter instruction accordingly;
C. Use multiple assessments (authentic, screening, diagnostic, formative, benchmark, and summative) that are developmentally appropriate for young adolescent learners;
D. Implement technology in student assessment measures;
E. Use multiple assessment strategies that effectively measure student mastery of the curriculum in more than one way;
F. Design assessments that target academic standards and assessment anchor content standards in subject areas.

ADDENDUM
GENERAL STATEWIDE PROGRAM-TO-PROGRAM ARTICULATION in PENNSYLVANIA

WHEREAS, the General Assembly of the Commonwealth of Pennsylvania enacted Act 114 of 2006, which added to the Public School Code of 1949, Article XX-C entitled "Transfers of Credits Between Institutions of Higher Education" (referred to in this Agreement as the "Statewide Transfer System");

WHEREAS, Act 114 of 2006 requires all community colleges in Pennsylvania and Pennsylvania State System of Higher Education (PASSHE) universities to participate in the Statewide Transfer System;

WHEREAS, Act 114 of 2006 permits independent and state-related institutions of higher education in Pennsylvania, as each is defined in Article XX-C, to elect to participate in the Statewide Transfer System;

WHEREAS, the General Assembly of the Commonwealth of Pennsylvania enacted Act 50 of 2009, which requires institutions participating in the Statewide Transfer System to accept the transfer of Associate of Arts and Associate Science degrees into parallel baccalaureate programs and recognize all competencies attained within the associate degree program;

WHEREAS, Act 50 of 2009 defines an Associate of Arts (AA) or Associate of Science (AS) degree containing a minimum of 60 college-level credits and designed primarily for transfer to a baccalaureate institution;

WHEREAS, Act 50 of 2009 requires the Transfer Articulation Oversight Committee (TAOC), as established in section 2004-C of the Public School Code of 1949, to identify Associate of Arts and Associate of Science degree programs for transfer with full junior standing into parallel baccalaureate degrees annually; and,

WHEREAS, Act 50 of 2009 requires members of the Transfer Articulation Oversight Committee established in section 2004-C of the Public School Code of 1949, to identify modifications that may be required in existing associate or baccalaureate degrees to satisfy external accreditation or licensure requirement;

All Institutions participating in the Statewide Transfer System enter into this Articulation Agreement and mutually agree as follows:

1. The statewide program-to-program articulation agreement ensures that students who complete an AA or AS degree from a participating institution will have their coursework and credits transfer into a parallel baccalaureate program with full junior standing and without the need for course-by-course equivalency.

2. Students are subject to the admissions and transfer credit policies of the participating institutions. The admissions and transfer credit policies for all of the institutions participating in Pennsylvania's college credit transfer system can be found at www.PAcollegetransfer.com.

3. The AA or AS degree must include a minimum of 60 college-level credits designed and acceptable for transfer, not including developmental or remedial courses or career, technical or applied courses.

4. The transfer of coursework with a grade less than a C (2.0 on a 4.0 scale) in the AA or AS will be consistent with the policies of native students at the participating college or university.

5. Students and institutional personnel will be able to find out which institutions offer articulated programs by accessing a searchable database located at www.PAcollegetransfer.com. PDE will maintain this database through program information provided to TAOC by the individual participating institutions.

6. **Responsibilities of Associate Degree Institutions**
   a. The AA or AS degree leading to a parallel bachelor degree will include the minimum number of credits and competencies of major-specific coursework as defined by the Agreement.

b. Any remaining AA or AS degree requirements will be accepted from arts and sciences electives designed and acceptable for transfer, not including developmental, remedial, career, technical or applied courses.

c. By awarding the AA or AS, the Associate Degree Institution is validating that the student has met the competency requirements outlined in the Agreement.

7. Responsibilities of Bachelor Degree Institutions

a. The Bachelor Degree Institution will recognize all competencies attained within the AA or AS degree and accept a transfer student who has earned the associate degree with full junior standing into a parallel baccalaureate degree program.

b. All decisions made with respect to the transfer process shall be based on the principle of equivalence of expectations and requirements for native and transfer students.

c. A transfer student's admission into the parallel baccalaureate degree will be subject to the Bachelor Degree Institution's specific requirements for admission to that major and be consistent with such requirements for native students.

8. Agreement Revision and Assessment

a. Once a statewide program-to-program articulation agreement has been approved by TAOC, no amendments to the agreement can be offered by any party within the initial six (6) months of the agreement. After that time, a TAOC member with a proposed amendment to an approved agreement should submit the change to PDE.

Amendments that are offered as clarifying or technical but do not alter the substantive portions or intent of the agreement must be forwarded to TAOC. TAOC representatives will have at least thirty (30) days to review, comment and approve or deny the proposed amendments.

Amendments that seek to alter the substantive nature or intent of the agreement in any part must be forwarded to the appropriate PAC for review and consideration. The PAC will then make a recommendation to the TAOC, and TAOC shall approve or deny the proposed amendments.[1]

b. PDE and TAOC will exercise responsibility for monitoring the effectiveness of the Agreement and its implementation.

c. PDE shall collect data annually from the participating institutions that will enable the Department and TAOC to assess the effectiveness of the implementation of the Agreement in fostering a seamless transfer process and the academic success of transfer students at the senior institutions.

9. Transfer Appeal Process

a. In accordance with Pennsylvania's Statewide Transfer System, each Bachelor Degree Institution shall have a procedure through which a transfer student can appeal a decision that he/she believes is not consistent with this Agreement.

b. The Transfer Appeal Process shall be published, at minimum, in the institution's catalog and posted to the Commonwealth's official website of the Statewide Transfer System, www.PAcollegetransfer.com.

10. Institutional Resolution of Disputes

a. In the event that an Associate Degree Institution considers the decision of a Bachelor Degree Institution to be inconsistent with this Agreement, the Associate Degree Institution shall consult directly with the Bachelor Degree Institution and attempt to resolve the matter.

[1] Approved by TAOC and added to agreement on August 18, 2011.

b. If the institutions are unable to resolve the issue, the Associate Degree Institution may submit their concern to PDE for consideration by the TAOC Dispute Resolution Committee. The Dispute Resolution Subcommittee will act according to the policies and procedures developed by TAOC as part of the Statewide Transfer System. The determination made by the Dispute Resolution Subcommittee will be binding upon the parties.

11. **Implementation Date and Applicability**

Having fulfilled the requirements outlined in the Program-to-Program Articulation Agreement, students transferring with an AA or AS degree from a participating institution will be considered by the receiving baccalaureate degree institution to have received adequate preparation in the field of study at the foundation level and therefore eligible to transfer as a junior into advanced major coursework.

Participating institutions will enact the Agreement in accordance to the timeline outlined by the TAOC, but no later Fall 2013.[2]

Continuation of the agreement remains in effect until such time as all cooperating institutions of the Statewide Transfer System formally approve any revisions.

GLOSSARY OF TERMS

Articulation: The aligning of curriculum between institutions of higher education to ensure the efficient and effective movement of students among those institutions.

Associate of Arts (AA) and Associate of Science (AS) Degree: A degree consisting of at least 60 college-level credits and designed for transfer into a baccalaureate degree program.

Foundation Coursework: Courses at a level of comprehension usually associated with freshman and sophomore students and typically offered during the first half of a baccalaureate degree program. Such coursework typically does not have course prerequisites.

Native Student: A student who entered a given college or university without first matriculating at another college.

Parallel Baccalaureate Degree: A bachelor degree program in a comparable field of study and with similar foundation-level major-specific competencies as an associate degree program.

Receiving Institution: The college or university where a transfer student plans to enroll and to apply previously earned credit toward a degree program.

Transfer Credit: The credit granted by a college or university for college-level courses or other academic work completed at another institution.

Transfer Student: A student who enters a participating college or university after earning college-level credit at another college or university.

Transfer: The process by which a student moves from one postsecondary institution to another. Also refers to the mechanics of credit, course and curriculum exchange between institutions.

Advanced Coursework: Courses with advanced depth of content knowledge in the field of study and carry the expectation of more complex competencies identified in the expected student learning outcomes is referred to as advanced coursework. These courses often have prerequisites and are usually beyond the "Introduction to…" or "Foundation of…" level.

[2] Agreements approved by TAOC prior to August 31, 2011 must be implemented by the institutions by Fall 2012. Agreements approved by TAOC after August 31, 2011 but before May 1, 2012 must be implemented by the institutions by Fall 2013.