NCTM Standards (2020) Reviewer Rubrics – Middle Level (Initial Preparation)

All programs involved in compiling and submitting program reports should take full advantage of **available resources** to support this process at www.nctm.org/caep.

Standard 1: Knowing and Understanding Meaningful Mathematics

Standard 1: Candidates demonstrate and apply understandings of major mathematics concepts, procedures, knowledge, and applications within and among mathematical domains of Number and Operations; Algebra and Functions; Statistics and Probability; Geometry, Trigonometry, and Measurement.

Program Evidence of Candidates' Attainment of Standard 1:
- Assessments, rubrics, and data charts are aligned with standard components.
- Alignment to standard component(s) is provided within assessment rubrics per criterion.
- Data charts are aligned with assessment rubric and report completer/candidate performance by the level (individually scored items) at which it is collected.
- Assessment rubrics contain discernible levels of performance.
- Assessments are required of all candidates.

Decision Criteria: Attainment of Standard 1 is based on three considerations:
1) State-required mathematics content area licensure exams aligned to components of NCTM Standard 1 for Middle Level accompanied by completer performance data from a minimum of two academic years for an initial report or a minimum of one academic year for a response to conditions or revised report. Performance data must include, at minimum, mean and range or standard deviation values.
2) At least one additional assessment accompanied by completer/candidate performance data from a minimum of two applications for an initial report or a minimum of one application for a response to conditions or revised report. Assessments can be selected from:
   - Grades in required mathematics or mathematics education courses aligned to components of NCTM Standards (2020) for Middle Level and overall GPAs in required mathematics coursework accompanied by completer performance data.
     - A transcript analysis is required for completers where mathematics or equivalent coursework was not taken at program's institution that includes required undergraduate content major coursework alignment to components of NCTM Standards (2020).
     - Guidelines and templates for the use of course grades are available at the NCTM website.
   - Content-based assessment such as projects, course portfolio, or other course products aligned to the components of NCTM Standard 1 for Middle Level accompanied by candidate performance data.
3) A preponderance of evidence drawn from the components:
   - Preponderance of evidence is defined as "an overall confirmation that candidates meet standards in the strength, weight, or quality of evidence," rather than satisfactory performance for each component. A commonly accepted definition of preponderance of evidence is a requirement that more than 50% of the evidence favors a given outcome. NCTM program review decisions are based on the preponderance of evidence at the standard level using this definition. Specifically, more than 50% of the components (including required components) must be met at level 3 or level 4.
   - Required components 1a, 1b, 1c, and 1d must be met at level 3 or level 4 in order to satisfy the preponderance of evidence for Standard 1.

*1a) Essential Concepts in Number and Operations. Candidates demonstrate and apply understandings of major mathematics concepts, procedures, knowledge, and applications of number including flexibly applying procedures, and using real and rational numbers in contexts, attending to units, developing solution strategies and evaluating the correctness of conclusions. Major mathematical concepts in Number include number systems (particularly rational numbers); algorithmic and recursive thinking; number and set theory; ratio, rate of change, and proportional reasoning; and structure, relationships, operations, and representations.

Level 1 The Beginning Candidate	Level 2 The Developing Candidate	Level 3 The Competent Candidate	Level 4 The Accomplished Candidate
Candidate does not demonstrate or apply understandings of major mathematics concepts procedures, knowledge or applications in Number.	Candidate demonstrates understandings of major mathematics concepts, procedures and/or knowledge of number. Candidate is not able to apply the major mathematical concepts in Number.	Candidate demonstrates and applies understandings of major mathematics concepts, knowledge, and applications in Number. Candidate uses technology to enhance their learning in Number.	Candidate demonstrates and applies understandings of major mathematics concepts, knowledge, and applications in Number. Candidate uses technology to enhance their learning of Number. Candidate makes connections within and among mathematical domains.

*1b) Essential Concepts in Algebra and Functions. Candidates demonstrate and apply understandings of major mathematics concepts, procedures, knowledge, and applications of algebra and functions including how mathematics can be used systematically to represent patterns and relationships among numbers and other objects, analyze change, and model everyday events and problems of life and society. Essential Concepts in Algebra and Functions include algebra that connects mathematical structure to symbolic, graphical, and tabular descriptions; connecting algebra to functions; induction; and develops families of functions of discrete and continuous variables as a fundamental concept of mathematics.

Level 1 The Beginning Candidate	Level 2 The Developing Candidate	Level 3 The Competent Candidate	Level 4 The Accomplished Candidate
Candidate does not demonstrate or apply understandings of major mathematics concepts, procedures, knowledge or applications in Algebra and Functions.	Candidate demonstrates understanding of major mathematics concepts, procedures and/or knowledge of number. Candidate is not able to apply the major mathematical concepts in Algebra and Functions.	Candidate demonstrates and applies understandings of major mathematics concepts, procedures, knowledge, and applications in Algebra and Functions. Candidate uses technology to enhance their learning of Algebra and Functions.	Candidate demonstrates and applies conceptual understanding, procedural fluency, and factual knowledge of major mathematical concepts in Algebra and Functions. Candidate uses technology to enhance their learning of Algebra and Functions. Candidate makes connections within and among mathematical domains.

*1c) Essential Concepts in Statistics and Probability. Candidates demonstrate and apply understandings of major mathematics concepts, procedures, knowledge, and applications of statistics and probability including how statistical problem solving and decision making depend on understanding, explaining, and quantifying the variability in a set of data to make decisions. They understand the role of randomization and chance in determining the probability of events. Essential Concepts in Statistics and Probability include quantitative literacy; visualizing and summarizing data; statistical inference; probability; exploratory data analysis and applied problems and modeling.

Level 1 The Beginning Candidate	Level 2 The Developing Candidate	Level 3 The Competent Candidate	Level 4 The Accomplished Candidate
Candidate does not demonstrate an understanding of statistical thinking or apply understandings of major concepts, procedures and knowledge of Statistics and Probability.	Candidate demonstrates an understanding of statistical thinking, concepts and procedures. Candidate is not able to apply the major mathematical concepts in Statistics and Probability.	Candidate demonstrates an understanding of statistical thinking, and the major concepts, procedures, knowledge and applications of Statistics and Probability. Candidate uses technology to enhance their learning of Statistics and Probability.	Candidate demonstrates an understanding of statistical thinking, and the major concepts, procedures, knowledge and applications of Statistics and Probability. Candidate uses technology to enhance their learning of Statistics and Probability. Candidate makes connections within and among mathematical domains.

*1d) Essential Concepts in Geometry, Trigonometry, and Measurement. Candidates demonstrate and apply understandings of major mathematics concepts, procedures, knowledge, and applications of geometry including using visual representations for numerical functions and relations, data and statistics, and networks, to provide a lens for solving problems in the physical world. Essential Concepts in Geometry, Trigonometry, and Measurement include measurement; transformations; scale; graph theory; geometric arguments; reasoning and proof; applied problems and modeling; development of axiomatic proof; and the Pythagorean theorem.

Level 1 The Beginning Candidate	Level 2 The Developing Candidate	Level 3 The Competent Candidate	Level 4 The Accomplished Candidate
Candidate does not demonstrate or apply understandings of major mathematics concepts, procedures, knowledge or applications in Geometry, Trigonometry and Measurement.	Candidate demonstrates understanding of major mathematics concepts, procedures and/or knowledge in Geometry, Trigonometry and Measurement. Candidate is not able to apply the major mathematical concepts in Geometry, Trigonometry, and Measurement.	Candidate demonstrates and applies understandings of major mathematics concepts, procedures, knowledge, and applications of Geometry, Trigonometry, and Measurement. Candidate uses technology to enhance their learning of Geometry, Trigonometry, and Measurement.	Candidate demonstrates and applies understandings of major mathematics concepts, procedures, knowledge, and applications of Geometry, Trigonometry, and Measurement. Candidate uses technology to enhance their learning of Geometry, Trigonometry, and Measurement. Candidate makes connections within and among mathematical domains.

Standard 2: Knowing and Using Mathematical Processes

Standard 2: Candidates demonstrate, within or across mathematical domains, their knowledge of and ability to apply the mathematical processes of problem solving; reason and communicate mathematically; and engage in mathematical modeling. Candidates apply technology appropriately within these mathematical processes.

Program Evidence of Candidates' Attainment of Standard 2:
- Assessments, rubrics, and data charts are aligned with standard components.
- Alignment to standard component(s) is provided within assessment rubrics per criterion.
- Data charts are aligned with assessment rubric and report completer/candidate performance by the level (individually scored items) at which it is collected.
- Assessment rubrics contain discernible levels of performance.
- Assessments are required of all candidates.

Decision Criteria: Attainment of Standard 2 is based on two considerations:
1) At least two assessments aligned to components of NCTM Standards (2020) for Middle Level accompanied by candidate performance data from a minimum of two applications for an initial report or a minimum of one application for a response to conditions or revised report. Assessments can be selected from:
   - Grades in required mathematics or mathematics education courses aligned to components of NCTM Standards (2020) and overall GPAs in required mathematics coursework accompanied by completer performance data.
     - ➢ A transcript analysis is required for completers where mathematics or equivalent coursework was not taken at program's institution that includes required undergraduate content major coursework alignment to components of NCTM Standards (2020).
     - ➢ Guidelines and templates for the use of course grades are available at the [NCTM website](#).
   - Projects, course or student teaching/internship portfolio, or course products aligned to components of NCTM Standard 2 for Middle Level accompanied by candidate performance data.
2) A preponderance of evidence drawn from the components:
   - Preponderance of evidence is defined as "an overall confirmation that candidates meet standards in the strength, weight, or quality of evidence," rather than satisfactory performance for each component. A commonly accepted definition of preponderance of evidence is a requirement that more than 50% of the evidence favors a given outcome. NCTM program review decisions are based on the preponderance of evidence at the standard level using this definition. Specifically, more than 50% of the components (including required components) must be met at level 3 or level 4.
   - Required components 2a, 2b, and 2c must be met at level 3 or level 4 in order to satisfy the preponderance of evidence for Standard 2.

*2a) Problem Solving. Candidates demonstrate a range of mathematical problem-solving strategies to make sense of and solve nonroutine problems (both contextual and noncontextual) across mathematical domains.

Level 1 The Beginning Candidate	Level 2 The Developing Candidate	Level 3 The Competent Candidate	Level 4 The Accomplished Candidate
Candidate solves nonroutine problems (contextual or noncontextual) when given a strategy.	Candidate solves nonroutine problems (contextual and noncontextual) when given a strategy.	Candidate demonstrates use of mathematical problem-solving strategies to make sense of and solve contextual and noncontextual problems in more than one mathematical domain.	Candidate demonstrates coordination and unprompted use of multiple mathematical problem-solving strategies when making sense of and solving contextual and noncontextual problems across mathematical domains. Candidate can compare strategies and make connections across domains.

*2b) Reasoning and Communicating. Candidates organize their mathematical reasoning and use the language of mathematics to express their mathematical reasoning precisely, both orally and in writing, to multiple audiences.

Level 1 The Beginning Candidate	Level 2 The Developing Candidate	Level 3 The Competent Candidate	Level 4 The Accomplished Candidate
Candidate is unable to organize their own mathematical reasoning and does not use the language of mathematics.	Candidate is able to organize their own mathematical reasoning using the language of mathematics with prompting and support. Candidate is able to express their mathematical reasoning orally or in writing.	Candidate is able to organize their own mathematical reasoning and use the language of mathematics to express their mathematical reasoning precisely, both orally and in writing, to multiple audiences.	Candidate is able to organize their own mathematical reasoning and use of the language of mathematics to express their mathematical reasoning precisely, both orally and in writing, to multiple audiences. Candidate seeks out opportunities to share their mathematical reasoning with professors, peers, and colleagues.

*2c) Mathematical Modeling and Use of Mathematical Models. Candidates understand the difference between the mathematical modeling process and models in mathematics. Candidates engage in the mathematical modeling process and demonstrate their ability to model mathematics.			
Level 1 The Beginning Candidate	**Level 2** The Developing Candidate	**Level 3** The Competent Candidate	**Level 4** The Accomplished Candidate
Candidate does not demonstrate the ability to use the process of mathematical modeling or is unable to formulate and interpret mathematical models.	Candidate uses the process of mathematical modeling and formulates and represents but needs assistance in analyzing and interpreting models.	Candidate uses the process of mathematical modeling to formulate, represent, analyze, and interpret mathematical models using a variety of tools, including technology from real-world contexts or mathematical problems. Candidate can articulate the difference between a mathematical model and the mathematical modeling process.	Candidate uses the process of mathematical modeling to formulate, represent, analyze and interpret mathematical models derived from real-world context and mathematical problems. The candidate seeks opportunities to extend and reformulate models based on analysis. Candidate can demonstrate the mathematical modeling process.

Standard 3: Knowing Students and Planning for Mathematical Learning

Standard 3: Candidates use knowledge of students and mathematics to plan rigorous and engaging mathematics instruction supporting students' access and learning. The mathematics instruction developed provides equitable, culturally responsive opportunities for all students to learn and apply mathematics concepts, skills, and practices.

Program Evidence of Candidates' Attainment of Standard 3:
- Assessments, rubrics, and data charts are aligned with standard components.
- Alignment to standard component(s) is provided within assessment rubrics per criterion.
- Data charts are aligned with assessment rubric and report completer/candidate performance by the level (individually scored items) at which it is collected.
- Assessment rubrics contain discernible levels of performance.
- Assessments are required of all candidates.

Decision Criteria: Attainment of Standard 3 is based on two considerations:
1) At least one assessment aligned to components of NCTM Standards (2020) for Middle Level accompanied by candidate performance data from a minimum of two applications for an initial report or a minimum of one application for a response to conditions or revised report. Assessments can be selected from lesson/unit plans, observations of teaching (student teaching, internship, practicum, etc.), or other assessments that particularly address how knowledge of students was used when instructional choices were made.
2) A preponderance of evidence drawn from the components:
   - Preponderance of evidence is defined as "an overall confirmation that candidates meet standards in the strength, weight, or quality of evidence," rather than satisfactory performance for each component. A commonly accepted definition of preponderance of evidence is a requirement that more than 50% of the evidence favors a given outcome. NCTM program review decisions are based on the preponderance of evidence at the standard level using this definition. Specifically, more than 50% of the components (including required components) must be met at level 3 or level 4.
   - Required component 3a must be met at level 3 or level 4 in order to satisfy the preponderance of evidence for Standard 3.

*3a) Student Diversity. Candidates identify and use students' individual and group differences when planning rigorous and engaging mathematics instruction that supports students' meaningful participation and learning.

Level 1 The Beginning Candidate	Level 2 The Developing Candidate	Level 3 The Competent Candidate	Level 4 The Accomplished Candidate
Candidate does not use students' individual differences or group differences in planning rigorous and engaging mathematics instruction.	Candidate uses students' individual or group differences in planning rigorous and engaging mathematics instruction for a subset of students.	Candidate uses students' individual and group differences in planning rigorous and engaging mathematics instruction that supports meaningful participation and learning across a full range of students.	Candidate uses students' individual and group differences in planning rigorous and engaging mathematics instruction that supports meaningful participation and learning by each and every student.

3b) Students' Mathematical Strengths. Candidates identify and use students' mathematical strengths to plan rigorous and engaging mathematics instruction that supports students' meaningful participation and learning.

Level 1 The Beginning Candidate	Level 2 The Developing Candidate	Level 3 The Competent Candidate	Level 4 The Accomplished Candidate
Candidate does not use students' mathematical strengths in planning rigorous and engaging mathematics instruction.	Candidate uses students' mathematical strengths in planning rigorous and engaging mathematics instruction for a subset of students.	Candidate uses students' mathematical strengths in planning rigorous and engaging mathematics instruction that supports meaningful participation and learning across a full range of students.	Candidate uses students' mathematical strengths in planning rigorous and engaging mathematics instruction that supports meaningful participation and learning by each and every student.

3c) Positive Mathematical Identities. Candidates understand that teachers' interactions impact individual students by influencing and reinforcing students' mathematical identities, positive or negative, and plan experiences and instruction to develop and foster positive mathematical identities.

Level 1 The Beginning Candidate	Level 2 The Developing Candidate	Level 3 The Competent Candidate	Level 4 The Accomplished Candidate
Candidate does not recognize that teachers' interactions impact individual students by influencing and reinforcing student's mathematical identities, positive or negative; or candidate does not plan experiences and instruction to develop and foster students' positive mathematical identities for a subset of students.	Candidate understands that teachers' interactions impact individual students by influencing and reinforcing student's mathematical identities, positive or negative. Candidate plans experiences and instruction to develop and foster students' positive mathematical identities for a subset of students.	Candidate understands that teachers' interactions impact individual students by influencing and reinforcing student's mathematical identities, positive or negative. Candidate plans experiences and instruction to develop and foster students' positive mathematical identities across a full range of students.	Candidate understands that teachers' interactions impact individual students by influencing and reinforcing student's mathematical identities, positive or negative. Candidate plans experiences and instruction to develop and foster students' positive mathematical identities for each and every student.

Standard 4: Teaching Meaningful Mathematics

Standard 4: Candidates implement effective and equitable teaching practices to support rigorous mathematical learning for a full range of students. Candidates establish rigorous mathematics learning goals, engage students in high cognitive demand learning, use mathematics specific tools and representations, elicit and use student responses, develop conceptual understanding and procedural fluency, and pose purposeful questions to facilitate student discourse.

Program Evidence of Candidates' Attainment of Standard 4:
- Assessments, rubrics, and data charts are aligned with standard components.
- Alignment to standard component(s) is provided within assessment rubrics per criterion.
- Data charts are aligned with assessment rubric and report completer/candidate performance by the level (individually scored items) at which it is collected.
- Assessment rubrics contain discernible levels of performance.
- Assessments are required of all candidates.

Decision Criteria: Attainment of Standard 4 is based on two considerations:
1) At least two assessments aligned to components of NCTM Standards (2020) for Middle Level accompanied by candidate performance data from a minimum of two applications for an initial report or a minimum of one application for a response to conditions or revised report. Evidence provided for this standard must be enacted instruction. A unit plan alone is insufficient; it must actually be implemented in a classroom. The components described in Standard 4 may not be evident in a single day of instruction, but they must be evident within a unit of instruction. Therefore, a unit plan that was implemented, along with lesson observations and reflections on teaching, would combine to provide evidence across Standard 4 components. Evidence can also be from other teaching performances and reflections, such as student interviews and transcript analysis, or standards performance instruments, such as the edTPA.
2) A preponderance of evidence drawn from the components:
   - Preponderance of evidence is defined as "an overall confirmation that candidates meet standards in the strength, weight, or quality of evidence," rather than satisfactory performance for each component. A commonly accepted definition of preponderance of evidence is a requirement that more than 50% of the evidence favors a given outcome. NCTM program review decisions are based on the preponderance of evidence at the standard level using this definition. Specifically, more than 50% of the components (including required components) must be met at level 3 or level 4.
   - There are no required components for Standard 4.

4a) Establish Rigorous Mathematics Learning Goals. Candidates establish rigorous mathematics learning goals for students based on mathematics standards and practices.

Level 1 The Beginning Candidate	Level 2 The Developing Candidate	Level 3 The Competent Candidate	Level 4 The Accomplished Candidate
Candidate establishes mathematics learning goals for students which lack rigor.	Candidate establishes mathematics learning goals for students which demonstrate some level of rigor but are not situated within mathematics standards and practices, or the purposes for learning mathematics.	Candidate establishes rigorous mathematics learning goals for students situated within mathematics standards and practices, and the purposes for learning mathematics.	Candidate establishes rigorous mathematics learning goals for students situated within learning progressions, mathematics standards and practices, and the purposes for learning mathematics. Candidate recognizes and uses connections when establishing goals.

4b) Engage Students in High Cognitive Demand Learning. Candidates select or develop and implement high cognitive demand tasks to engage students in mathematical learning experiences that promote reasoning and sense making.

Level 1 The Beginning Candidate	Level 2 The Developing Candidate	Level 3 The Competent Candidate	Level 4 The Accomplished Candidate
Candidate selects tasks without regard to engaging students in high cognitive demand mathematical learning experiences.	Candidate selects or develops tasks that could engage students in high cognitive demand mathematical learning experiences, but implementation fails to maintain a high cognitive demand with students.	Candidate selects or develops and implements tasks to engage a full range of students in high cognitive demand mathematical learning experiences that promote reasoning and sense making.	Candidate analyzes, modifies, sequences, and implements tasks to engage each and every student in high cognitive demand mathematical learning experiences that promote reasoning and sense making.

4c) Incorporate Mathematics-Specific Tools. Candidates select mathematics-specific tools, including technology, to support students' learning, understanding, and application of mathematics and to integrate tools into instruction.

Level 1 The Beginning Candidate	Level 2 The Developing Candidate	Level 3 The Competent Candidate	Level 4 The Accomplished Candidate
Candidate selects tools without regard to supporting students' learning, understanding, and application of mathematics.	Candidate selects mathematics-specific tools, including technology, to support students' learning, understanding, and application of mathematics but is unable or unsuccessful in integrating tools into instruction.	Candidate selects mathematics-specific tools, including technology, to support a full range of students' learning, understanding, and application of mathematics and integrates tools into instruction.	Candidate selects mathematics-specific tools, including technology, to support each and every students' learning, understanding, and application of mathematics and integrates tools into instruction.

4d) Use Mathematical Representations. Candidates select and use mathematical representations to engage students in examining understandings of mathematics concepts and the connections to other representations.

Level 1 The Beginning Candidate	Level 2 The Developing Candidate	Level 3 The Competent Candidate	Level 4 The Accomplished Candidate
Candidate selects mathematical representations without regard to supporting students' learning, understanding, and application of mathematics.	Candidate selects mathematical representations to support students' learning, understanding, and application of mathematics but is unable or unsuccessful in implementing or connecting representations during instruction.	Candidate selects mathematical representations to support students' learning, understanding, and application of mathematics and implements and connects representations during instruction.	Candidate selects and connects mathematical representations to support students' learning, understanding, and application of mathematics and implements and facilitates students in making connections between representations.

4e) Elicit and Use Student Responses. Candidates use multiple student responses, potential challenges, and misconceptions, and they highlight students' thinking as a central aspect of mathematics teaching and learning.

Level 1 The Beginning Candidate	Level 2 The Developing Candidate	Level 3 The Competent Candidate	Level 4 The Accomplished Candidate
Candidate is unable to elicit or use student responses reflecting their thinking to inform instruction.	Candidate elicits multiple student responses reflecting their thinking, including potential challenges or misconceptions. Candidate is unable to use student responses to inform the mathematics teaching and learning process.	Candidate elicits multiple student responses, potential challenges, and misconceptions. Candidate notices and tracks multiple student responses, as well as challenges or misconceptions as students are solving problems. Candidate uses students' multiple methods and/or challenges and/or misconceptions to engage the full range of students in extending their mathematical learning.	Candidate considers individual and group differences when eliciting multiple student responses, potential challenges, and misconceptions. Candidate notices and tracks multiple student responses as well as challenges or misconceptions as students are solving problems. Candidate uses students' multiple methods and/or challenges and/or misconceptions to engage each and every student in extending their mathematical learning.

4f) Develop Conceptual Understanding and Procedural Fluency. Candidates use conceptual understanding to build procedural fluency for students through instruction that includes explicit connections between concepts and procedures.

Level 1 The Beginning Candidate	Level 2 The Developing Candidate	Level 3 The Competent Candidate	Level 4 The Accomplished Candidate
Candidate designs instruction that does not include both conceptual understanding and procedural fluency.	Candidate designs instruction that includes both conceptual understanding and procedural fluency, but the conceptual understanding does not serve as a foundation for or is not connected to developing procedural fluency.	Candidate designs and implements instruction that uses conceptual understanding to build procedural fluency, including explicit connections between concepts and procedures.	Candidate designs and implements instruction that uses conceptual understanding to build procedural fluency, including explicit connections between concepts and procedures. Candidate facilitates students making connections between procedures and concepts.

4g) Facilitate Discourse. Candidates pose purposeful questions to facilitate discourse among students that ensures that each student learns rigorous mathematics and builds a shared understanding of mathematical ideas.

Level 1 The Beginning Candidate	Level 2 The Developing Candidate	Level 3 The Competent Candidate	Level 4 The Accomplished Candidate
Candidate is unable to pose questions that focus on rigorous learning goals and is not able to facilitate discourse among students in support of building shared understanding of mathematical ideas.	Candidate poses questions that focus students on the rigorous mathematical goals or making connections; or candidate facilitates discourse among students to build shared understanding of mathematical ideas, but discourse is limited to a subset of students.	Candidate poses questions that focus students on the rigorous mathematical goals or making connections. Candidate facilitates discourse among students to build shared understanding of mathematical ideas and ensure that a full range of students engage in rigorous mathematics.	Candidate poses questions that focus students on the rigorous mathematical goals and making connections. Candidate facilitates discourse among students to build shared understanding of mathematical ideas and ensures that each and every student engages in rigorous mathematics.

Standard 5: Assessing Impact on Student Learning

Standard 5: Candidates assess and use evidence of students' learning of rigorous mathematics to improve instruction and subsequent student learning. Candidates analyze learning gains from formal and informal assessments for individual students, the class as a whole, and subgroups of students disaggregated by demographic categories, and they use this information to inform planning and teaching.

Program Evidence of Candidates' Attainment of Standard 5:
- Assessments, rubrics, and data charts are aligned with standard components.
- Alignment to standard component(s) is provided within assessment rubrics per criterion.
- Data charts are aligned with assessment rubric and report completer/candidate performance by the level (individually scored items) at which it is collected.
- Assessment rubrics contain discernible levels of performance.
- Assessments are required of all candidates.

Decision Criteria: Attainment of Standard 5 is based on two considerations:
1) At least one assessment aligned to components of NCTM Standards (2020) for Middle Level accompanied by candidate performance data from a minimum of two applications for an initial report or a minimum of one application for a response to conditions or revised report. Evidence for Standard 5 must show the full range of the assessment cycle and demonstrate actual implementation of assessment strategies through analysis of the results of data from work with middle level students. The evidence can come from field experiences or student teaching or internships. An assessment of impact on students' learning could include student work samples, performance assessments such as the edTPA, case studies of Middle Level classrooms, student interviews, and classroom action research projects.
2) A preponderance of evidence drawn from the components:
   - Preponderance of evidence is defined as "an overall confirmation that candidates meet standards in the strength, weight, or quality of evidence," rather than satisfactory performance for each component. A commonly accepted definition of preponderance of evidence is a requirement that more than 50% of the evidence favors a given outcome. NCTM program review decisions are based on the preponderance of evidence at the standard level using this definition. Specifically, more than 50% of the components (including required components) must be met at level 3 or level 4.
   - There are no required components for Standard 5.

5a) Assessing for Learning. Candidates select, modify, or create both informal and formal assessments to elicit information on students' progress toward rigorous mathematics learning goals.

Level 1 The Beginning Candidate	Level 2 The Developing Candidate	Level 3 The Competent Candidate	Level 4 The Accomplished Candidate
Candidate uses informal and/or formal assessments, but assessments do not measure rigorous mathematics learning goals.	Candidate uses informal or formal assessments to elicit progress toward rigorous mathematics learning goals.	Candidate selects, creates, or adapts assessments and uses both informal and formal assessments to elicit progress toward rigorous mathematics learning goals for a full range of students.	Candidate selects, creates, or adapts assessments and uses both informal and formal assessments to elicit progress toward rigorous mathematics learning goals for students' individual learning.

5b) Analyze Assessment Data. Candidates collect information on students' progress and use data from informal and formal assessments to analyze progress of individual students, the class as a whole, and subgroups of students disaggregated by demographic categories toward rigorous mathematics learning goals.

Level 1 The Beginning Candidate	Level 2 The Developing Candidate	Level 3 The Competent Candidate	Level 4 The Accomplished Candidate
Candidate does not use data from assessments to analyze progress toward rigorous mathematics learning goals.	Candidate uses data from informal or formal assessments to analyze progress toward rigorous mathematics learning goals for selected students, the class as a whole, or subgroups of students disaggregated by demographic categories.	Candidate uses data from informal and formal assessments to analyze progress toward rigorous mathematics learning goals for selected students, the class as a whole, and subgroups of students disaggregated by demographic categories, when directed.	Candidate consistently uses data from informal and formal assessments to analyze progress toward rigorous mathematics learning goals for each individual student, the class as a whole, and subgroups of students disaggregated by demographic categories.

5c) Modify Instruction. Candidates use the evidence of student learning of individual students, the class as a whole, and subgroups of students disaggregated by demographic categories to analyze the effectiveness of their instruction with respect to these groups. Candidates propose adjustments to instruction to improve student learning for each and every student based on the analysis.

Level 1 The Beginning Candidate	Level 2 The Developing Candidate	Level 3 The Competent Candidate	Level 4 The Accomplished Candidate
Candidate does not use evidence of student learning to analyze the effectiveness of their instruction, or they analyze effectiveness of instruction without proposing adjustments to instruction.	Candidate uses evidence of student learning to analyze the effectiveness of their instruction and proposes adjustments to instruction, but those adjustments are not explicitly connected to the analysis of the data for selected students, the class as a whole, or subgroups of students disaggregated by demographic categories.	Candidate uses evidence of student learning to analyze the effectiveness of their instruction and proposes adjustments to instruction that are explicitly connected to the analysis of the data for selected students, the class as a whole, and subgroups of students disaggregated by demographic categories when directed.	Candidate consistently uses evidence of student learning to analyze the effectiveness of their instruction and propose adjustments to instruction that are explicitly connected to the analysis of the data and address the learning needs of each individual student, the class as a whole, and subgroups of students disaggregated by demographic categories without prompting.

Standard 6: Social and Professional Context of mathematics Teaching and Learning

Standard 6: Candidates are reflective mathematics educators who collaborate with colleagues and other stakeholders to grow professionally, to support student learning, and to create more equitable mathematics learning environments.

Program Evidence of Candidates' Attainment of Standard 6:
- Assessments, rubrics, and data charts are aligned with standard components.
- Alignment to standard component(s) is provided within assessment rubrics per criterion.
- Data charts are aligned with assessment rubric and report completer/candidate performance by the level (individually scored items) at which it is collected.
- Assessment rubrics contain discernible levels of performance.
- Assessments are required of all candidates.

Decision Criteria: Attainment of Standard 6 is based on two considerations:
1) At least one assessment aligned to components of NCTM Standards (2020) for Middle Level accompanied by candidate performance data from a minimum of two applications for an initial report or a minimum of one application for a response to conditions or revised report. The evidence for this standard suggests the documentation of professional development and collaboration as well as the documentation and critique of the conditions of schooling. Assessments could include analysis and reflection from teaching that highlight professional goals, artifacts that demonstrate collaboration with families and colleagues, or audits of beliefs regarding classroom/school policies that might advocate for better access/achievement for underrepresented groups and students.
2) A preponderance of evidence drawn from the components:
   - Preponderance of evidence is defined as "an overall confirmation that candidates meet standards in the strength, weight, or quality of evidence," rather than satisfactory performance for each component. A commonly accepted definition of preponderance of evidence is a requirement that more than 50% of the evidence favors a given outcome. NCTM program review decisions are based on the preponderance of evidence at the standard level using this definition. Specifically, more than 50% of the components (including required components) must be met at level 3 or level 4.
   - Required component 6a must be met at level 3 or level 4 in order to satisfy the preponderance of evidence for Standard 6.

*6a) Promote Equitable Learning Environments. Candidates seek to create more equitable learning environments by identifying beliefs about teaching and learning mathematics, and associated classroom practices that produce equitable or inequitable mathematical learning for students.

Level 1 The Beginning Candidate	Level 2 The Developing Candidate	Level 3 The Competent Candidate	Level 4 The Accomplished Candidate
Candidate is unable to identify beliefs and practices that produce inequitable mathematical learning experiences and outcomes for students.	Candidate identifies beliefs and classroom practices that produce inequitable mathematical learning experiences and outcomes for students. Candidate identifies beliefs that produce equitable mathematical learning experiences and outcomes for students.	Candidate identifies beliefs and classroom practices that produce equitable and inequitable mathematical learning experiences and outcomes for students. Candidate seeks out information to increase equitable practices and/or eliminate inequitable practices to further mathematical learning.	Candidate identifies personal beliefs, classroom practices, and systemic structures that produce equitable and inequitable mathematical learning experiences and outcomes for students. Candidate seeks out information to increase equitable practices and/or eliminate inequitable practices to further mathematical learning for individual students. Candidate demonstrates ways to help traditionally marginalized students experience success.

6b) Promote Positive Mathematical Identities. Candidates reflect on their impact on students' mathematical identities and develop professional learning goals that promote students' positive mathematical identities.

Level 1 The Beginning Candidate	Level 2 The Developing Candidate	Level 3 The Competent Candidate	Level 4 The Accomplished Candidate
Candidate reflects on their impact on students' mathematical identities but does not develop professional learning goals to better promote students' positive mathematical identities.	Candidate reflects on their impact on students' mathematical identities and develops professional learning goals that promote students' positive mathematical identities but without identifying specific strategies or resources.	Candidate reflects on their impact on students' mathematical identities and develops professional learning goals that promote students' positive mathematical identities, including specific strategies for meeting these goals.	Candidate reflects on their impact on individual student's mathematical identities and develops professional learning goals that promote students' positive mathematical identities, including specific strategies and professional resources for meeting these goals.

6c) Engage Families and Community. Candidates communicate with families to share and discuss strategies for ensuring the mathematical success of their children.

Level 1 The Beginning Candidate	Level 2 The Developing Candidate	Level 3 The Competent Candidate	Level 4 The Accomplished Candidate
Candidate communicates information to families about mathematical ideas and processes.	Candidate communicates information to families about mathematical ideas and processes and suggests good mathematics resources for families to contribute to the mathematical success of their children.	Candidate communicates with families about the mathematical ideas and processes that students are exploring, suggests good mathematics resources, and provides opportunities for the candidate and families to discuss strategies for ensuring the mathematical success of their children.	Candidate communicates with families about the mathematical ideas and processes that students are exploring, suggests good mathematics resources, and provides opportunities for the candidate and families to discuss strategies for ensuring the mathematical success of their children. Candidate seeks out opportunities in the community to understand and interact with families.

6d) Collaborate with Colleagues. Candidates collaborate with colleagues to grow professionally and support student learning of mathematics.

Level 1 The Beginning Candidate	Level 2 The Developing Candidate	Level 3 The Competent Candidate	Level 4 The Accomplished Candidate
Candidate identifies potential collaboration or professional learning opportunities that focus on learning and teaching in mathematics education.	Candidate collaborates with colleagues or participates in professional development and/or learning communities that focus on learning and teaching in mathematics education.	Candidate collaborates with colleagues to support student learning of mathematics. Candidate participates in professional development and/or learning communities that focus on learning and teaching in mathematics education.	Candidate collaborates with colleagues to support student learning of mathematics. Candidate participates in professional development and/or learning communities that focus on learning and teaching in mathematics education. Candidate participates in professional development opportunities based on targeted professional learning needs.

Standard 7: Middle Level Field Experiences and Clinical Practice

Standard 7: Effective teachers of middle level mathematics engage in a planned sequence of field experiences and clinical practice under the supervision of experienced and highly qualified mathematics teachers. They develop a broad experiential base of knowledge, skills, effective approaches to mathematics teaching and learning, and professional behaviors in settings that involve a diverse range and varied groupings of students. Candidates experience a full-time student teaching/internship in middle level mathematics supervised by university or college faculty with middle level or secondary mathematics teaching experience or equivalent knowledge base.[1]

Program Evidence of Candidates' Attainment of Standard 7:
- Descriptions of field experiences, clinical practice, and student teaching/internship that include sequencing, levels, candidate responsibilities, qualifications of supervisors, and diversity of settings and students and that clearly address Elements 7a and 7b are included.

Decision Criteria: Attainment of Standard 7 is based on two considerations:
1) Information provided in Section I – Context #1, #2 (Description of the field and clinical experiences required for the program), and #6 (Faculty Information) of the program report.
2) A preponderance of evidence drawn from the components:
   - Preponderance of evidence is defined as "an overall confirmation that candidates meet standards in the strength, weight, or quality of evidence," rather than satisfactory performance for each component. A commonly accepted definition of preponderance of evidence is a requirement that more than 50% of the evidence favors a given outcome. NCTM program review decisions are based on the preponderance of evidence at the standard level using this definition. Specifically, more than 50% of the components (including required components) must be met at level 2 or level 3.
   - Required components 7a and 7b must be met at level 2 or level 3 in order to satisfy the preponderance of evidence for Standard 7.

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[1] This standard is not a requirement for CAEP, but it is an NCTM requirement for a program to obtain National Recognition from the Council. The 2020 NCTM Standard 7 for Math programs was not based on the *Guidelines* outlined by CAEP's SPA Standards Review Committee. Instead, it is a specialty licensure area-specific requirement set by NCTM.

*7a) Design of Field Experiences and Clinical Practice. Candidates participate in a diverse range of field experiences and clinical practice in middle level settings with highly qualified mathematics teachers. (Evidence from Section I, Context 1 and 2)

Level 1 Unacceptable	Level 2 Acceptable	Level 3 Target
Descriptions of field experiences/internship do not adequately describe: The sequence of pre-student teaching/internship field experiences in middle level mathematics OR Do not ensure that participation in field experiences include varied settings and reflect cultural, ethnic, linguistic, gender and learning differences.	Descriptions of field experiences/internship describe how candidates: Engage in a planned sequence of pre-student teaching/internship field experiences in middle level mathematics with highly qualified mathematics teachers. Participate in field experiences that occur in varied settings and reflect cultural, ethnic, linguistic, gender, and learning differences.	Descriptions of field experiences/internship describe how candidates: Engage in a planned sequence of pre-student teaching/internship field experiences collaboratively designed with specific structures and assessments to ensure that effective teaching practices are implemented. Participate in middle level field and student teaching/internship experiences with highly qualified mathematics teachers that provide opportunities for teaching and reflection specifically tied to the developmental needs of different levels of standards appropriate for the grade levels. Participate in middle level field experiences designed to explicitly and overtly enhance candidate's abilities to address the needs of diverse students including consideration of cultural, ethnic, linguistic, gender and learning differences.

*7b) Supervision of Field Experiences. Supervisors for the full-time student teaching/internship in middle school mathematics have secondary or middle level mathematics teaching experience or equivalent knowledge base. (Evidence from Section I, Context 1, 2 and 6.)

Level 1 Unacceptable	Level 2 Acceptable	Level 3 Target
Supervisor does not have relevant secondary teaching experience or equivalent knowledge base. No procedures for how candidate will get the support and supervision is provided.	Candidates are supervised during the full-time student teaching/internship in middle level mathematics by a university or college supervisor with secondary or middle level mathematics teaching experience or equivalent knowledge base.	Candidates are supervised during the full-time student teaching/internship in middle school mathematics by a university or college supervisor with secondary or middle level mathematics teaching experience or equivalent knowledge base who has ongoing involvement in secondary or middle level partnerships.