

Evaluation for Pre-Service **Secondary Mathematics Teachers** (2012 NCTM Standards)

Use the rubric below. Please read carefully. *This rubric is intended to be developmental.* Note the intentional growth over time: beginning with limited awareness; to “emerging,” beginning understanding and attempts to apply; then “ready to teach,” application at the level of readiness to be “the teacher”; and then, “exceeds readiness,” demonstrating the understanding and behaviors of a teacher who has been teaching for at least the better part of a year.

This evaluation is used with our candidates in their Methods Practicum *and* in their Student Teaching.

1 - 4 = Limited: The teacher candidate demonstrates little awareness of the expectations of the standard element.

5 - 8 = Emerging: The teacher candidate demonstrates awareness of the expectations of the standard element and is beginning to his or her understanding.

9 - 12 = Ready to Teach: The teacher candidate demonstrates understanding of the expectations of the standard and demonstrates application at the level of someone ready to take the responsibility of the teacher.

13 - 16 = Exceeds Readiness: The teacher candidate demonstrates application of standard at the level of a teacher toward the end of his or her first year of teaching.

3/14/18

Standards 1 and 2 address the candidate’s knowledge and practice of mathematics.

CONTENT KNOWLEDGE

1—Effective teachers of secondary mathematics demonstrate and apply knowledge of major mathematics concepts, algorithms, procedures, connections, and applications within and among mathematical content domains.

	1 – 4 Limited	5 – 8 Emerging	9 – 12 Ready to Teach	13 – 16 Exceeds Readiness	Which domains did you observe?
1a Demonstrates and applies knowledge of major mathematics concepts, algorithms, procedures, connections, and applications within and among mathematical content domains (Number, Algebra, Geometry, Trigonometry, Statistics, Probability, Calculus, and Discrete Mathematics) as outlines in the <i>NCTM CAEP Mathematics Content for Secondary</i> .		<i>Basic Level of Knowledge of math concepts, algorithms, procedures.</i>	Demonstrates and applies knowledge of major mathematics concepts, algorithms, procedures, connections, & applications within and among mathematical content domains (Number, Algebra, Geometry, Trigonometry, Statistics, Probability, Calculus, & Discrete Mathematics).	<i>Exceptional Level of Knowledge of math concepts, algorithms, procedures and applications in varied contexts & connections.</i>	

IntASC Standard 4

MATHEMATICAL PRACTICES

2—Effective teachers of secondary mathematics solve problems, represent mathematical ideas, reason, prove, use mathematical methods, attend to precision, identify elements of structure, generalize, engage in mathematical communication, and make connections as essential mathematical practices. They understand that these practices within and among mathematical domains and in their teaching.

	1 – 4 Limited	5 – 8 Emerging	9 – 12 Ready to Teach	13 – 16 Exceeds Readiness	NO Opportunity To Demonstrate
2a: Uses problem solving to develop conceptual understanding, makes sense of a wide variety of problems and perseveres in solving them, applies and adapts a variety of strategies in solving problems confronted within the field of mathematics and other contexts, and formulates and tests conjectures in order to frame generalizations.		Uses problem solving to develop conceptual understanding. Makes sense of problems.	Uses problem solving to develop conceptual understanding. Makes sense of problems & perseveres in solving problems. Applies & adapts strategies in solving problems. Formulates & tests	Uses problem solving to develop conceptual understanding. Makes sense of a wide variety of problems & perseveres in solving them. Applies & adapts a variety of strategies in solving problems confronted within	

			conjectures to frame generalizations.	the field of mathematics & other contexts, and formulates. Tests conjectures in order to frame generalizations.	
<u>2b</u> : Reasons abstractly, reflectively, and quantitatively with attention to units, constructing viable arguments and proofs, and critiquing the reasoning of others; represents and models generalizations using mathematics; recognizes structure and expresses regularity in patterns of mathematical reasoning; uses multiple representations to model and describe mathematics; and utilizes appropriate mathematical vocabulary and symbols to communicate mathematical ideas to others.		Demonstrates the behaviors described by 2b most of the time, but not all.	Demonstrates the behaviors described by 2b consistently without being redirected or prompted.	Demonstrates the behaviors described by 2b consistently & frequently goes deeper to consider further implications of the math being studied.	
<u>2c</u> : Formulates, represents, analyzes, and interprets mathematical models derived from real-world contexts or mathematical problems.		Formulates, represents, analyzes, & interprets mathematical models derived from mathematical problems.	Formulates, represents, analyzes, & interprets mathematical models derived from real-world contexts or mathematical problems.	Formulates, represents, analyzes, and interprets mathematical models derived from real-world contexts or mathematical problems in order to learn more about the mathematics.	
<u>2d</u> : Organizes mathematical thinking and uses the language of mathematics to express ideas precisely, both orally and in writing to multiple audiences.		Organizes mathematical thinking & tries to use the language of mathematics to communicate.	Organizes mathematical thinking & uses the language of mathematics to express ideas orally & in writing to multiple audiences.	Organizes mathematical thinking & uses the language of mathematics to express ideas precisely, both orally & in writing to multiple audiences.	
<u>2e</u> : Demonstrates the interconnectedness of mathematical ideas and how they build on one another and recognizes and applies mathematical connections among mathematical ideas and across various content areas and real-world contexts.		Demonstrates the interconnectedness of mathematical ideas & how they build on one another.	Demonstrates the interconnectedness of mathematical ideas & how they build on one another. Recognizes & applies mathematical connections among mathematical ideas & across various content areas & real-world contexts.	Demonstrates the interconnectedness of mathematical ideas & how they build on one another. Recognizes & applies mathematical connections among mathematical ideas & across various content areas & real-world contexts. Seeks to extend this learning.	
<u>2f</u> : Model how the development of mathematical understanding within and among mathematical domains intersects with the practices of problem solving, reasoning, communicating, connecting, and representing.					

InTASC Standard 4

Content Pedagogy

3— Effective teachers of secondary mathematics apply knowledge of curriculum standards for mathematics and their relationship to student learning within and across mathematical domains. They incorporate research-based mathematical experiences and include multiple instructional strategies and mathematics-specific technological tools in their teaching to develop all students' mathematical understanding and proficiency. They provide students with opportunities to do mathematics—talking about it and connecting it to both theoretical and real-world contexts. They plan, select, implement, interpret, and use formative and summative assessments for monitoring student learning, measuring student mathematical understanding, and forming practice.

	1 – 4 Limited	5 – 8 Emerging	9 – 12 Ready to Teach	13 – 16 Exceeds Readiness	NO Opportunity To Demonstrate
<u>3a</u> : Applies knowledge of curriculum standards for secondary mathematics and their relationship to student learning within and across mathematical domains.		Is knowledgeable about the curriculum standards for secondary math.	Applies knowledge of curriculum standards for secondary math & their relationship to student learning within & across mathematical domains.	Applies knowledge of curriculum standards for secondary math & their relationship to student learning within & across mathematical domains & helps students see these relationships.	
<u>3b</u> : Analyzes and considers research in planning for and leading students in rich mathematical learning experiences.		Has some awareness of research in planning for & leading students in math learning.	Considers & uses research in planning for & leading students in rich mathematical learning experiences.	Analyzes & considers research in planning for & leading students in rich mathematical learning experiences.	
<u>3c</u> : Plans lessons and units that incorporate a variety of strategies, differentiated instruction for diverse populations, and mathematics-specific and instructional technologies in building all students' conceptual understanding and procedural proficiency.		Plans lessons that incorporate a variety of strategies.	Plans lessons & units that incorporate a variety of strategies, differentiated instruction, & mathematics-specific & instructional technologies in building all students' conceptual understanding & procedural proficiency.	Plans lessons & units that incorporate a variety of strategies, differentiated instruction for diverse populations, & mathematics-specific & instructional technologies in building all students' conceptual understanding & procedural proficiency.	
<u>3d</u> : Provides students with opportunities to communicate about mathematics and makes connections among mathematics, other content areas, everyday life, and the workplace.		Provides students with opportunities to communicate about mathematics.	Provides students with opportunities to communicate about mathematics. Makes connections among mathematics, other content areas, everyday life, & the workplace.	Communication about math & the connection among mathematics & other content areas, everyday life, & the workplace are the norm in the classroom.	
<u>3e</u> : Implements techniques related to student engagement and communication including selecting high quality tasks, guiding mathematical discussions, identifying key mathematical ideas, identifying and addressing student misconceptions, and employing a range of questioning strategies.		Implements techniques related to student engagement & communication	Implements techniques related to student engagement & communication. Selects high quality tasks. Guides mathematical discussions. Identifies key mathematical ideas. Identifies & addresses student misconceptions, & employs a range of questioning strategies.	Demonstrates the behaviors of the candidate "ready to teach." Purposeful math discussions are the norm in the classroom.	

<u>3f</u> : Plans, selects, implements, interprets, and uses formative and summative assessments to inform instruction by reflecting on mathematical proficiencies essential for all students.		Plans formative & summative assessment to inform instruction.	Plans, selects, implements, interprets, & uses formative & summative assessments to inform instruction by reflecting on mathematical proficiencies essential for all students.	Demonstrates the behaviors of the candidate "ready to teach." Assessments appropriately challenge students & allow students to recognize their learning.	
<u>3g</u> : Monitors students' progress, makes instructional decisions, and measures students' mathematical understanding and ability using formative and summative assessments.		Uses formative & summative assessment to make instructional decisions.	Monitors students' progress, makes instructional decisions, & measures students' mathematical understanding & ability using formative & summative assessments.	Demonstrates the behaviors of the candidate "ready to teach." Helps students use the results of assessment to guide them in their ownership for their learning.	

InTASC Standards 5 & 6

Mathematical Learning Environment

4— Effective teachers of secondary mathematics exhibit knowledge of adolescent learning, development, and behavior. They use this knowledge to plan and create sequential learning opportunities grounded in mathematics education research where students are actively engaged in mathematics they are learning and building from prior knowledge and skills. They demonstrate a positive disposition toward mathematical practices and learning, include culturally relevant perspectives in teaching, and demonstrate equitable and ethical treatment of and high expectations for all students. They use instructional tools such as manipulatives, digital tools, and virtual resources to enhance learning while recognizing the possible limitations of such tools.					
	1 – 4 Limited	5 – 8 Emerging	9 – 12 Ready to Teach	13 – 16 Exceeds Readiness	NO Opportunity To Demonstrate
<u>4a</u> : Exhibits knowledge of adolescent learning, development, and behavior and demonstrates a positive disposition toward mathematical processes and learning.		Exhibits some knowledge of adolescent learning & demonstrates positive disposition toward math learning.	Exhibits knowledge of adolescent learning, development, & behavior & demonstrates a positive disposition toward mathematical processes & learning.	Demonstrates the behaviors of a candidate "ready to teach." Recognizes not all students themselves have a positive disposition toward math learning & helps students realize math is "doable."	
<u>4b</u> : Plans and creates developmentally appropriate, sequential, and challenging learning opportunities grounded in mathematics education research in which students are actively engaged in building new knowledge from prior knowledge and experience.		Plans developmentally appropriate learning opportunities.	Plans & creates developmentally appropriate, sequential, & challenging learning opportunities grounded in mathematics education research in which students are actively engaged in building new knowledge from prior knowledge & experience.	Demonstrates the behaviors of a candidate "ready to teach." Continues to seek new ways to challenge students in their use of math.	
<u>4c</u> : Incorporates knowledge of individual differences and the cultural and language diversity that exists within classrooms and includes culturally relevant perspectives as a means to motivate and engage students.		Includes knowledge of individual differences as a means to motivate & engage students.	Incorporates knowledge of individual differences & the cultural and language diversity that exists within classrooms &	Demonstrates the behaviors of a candidate "ready to teach." Continues to explore ways to motivate & engage students.	

			includes culturally relevant perspectives as a means to motivate & engage students.		
4d: Demonstrates equitable and ethical treatment of and high expectations for all students.		Seeks to treat students equitably.	Demonstrates equitable & ethical treatment of & high expectations for all students.	Demonstrates the behaviors of a candidate "ready to teach." Continues to seek ways to challenge all students.	
4e: Applies mathematical content and pedagogical knowledge to select and use instructional tools such as manipulatives and physical models, drawings, virtual environments, spreadsheets, presentation tools, and mathematics-specific technologies (e.g. graphing tools, interactive geometry software, computer algebra systems, and statistical packages); and makes sound decisions about when such tools enhance teaching and learning, recognizing both the insights to be gained and possible limitations of such tools.		Applies math content & pedagogical knowledge to select & use instructional tools such as manipulatives & physical models, drawings, virtual environments, spreadsheets, presentation tools, & math-specific technologies (e.g. see standard at left.).	Applies math content & pedagogical knowledge to select & use instructional tools such as manipulatives & physical models, drawings, virtual environments, spreadsheets, presentation tools, & math-specific technologies (e.g. see standard at left.). Makes sound decisions about when such tools enhance teaching & learning, recognizing both the insights to be gained & possible limitations of such tools.	Demonstrates the behaviors of a candidate "ready to teach." Continues to explore ways to use tools, manipulatives, & technology to strengthen student opportunities to learn. Students recognize the value of these tools & initiate their use appropriately.	

InTASC Standards 1, 2, & 3

IMPACT ON STUDENT LEARNING

5—Effective teachers of secondary mathematics provide evidence demonstrating that as a result of their instruction, secondary students' conceptual understanding, procedural fluency, strategic competence, adaptive reasoning, and application of major mathematics concepts in varied disposition toward mathematics. They show the new student mathematical knowledge has been developmentally appropriate, require active engagement, and include mathematics-specific technology in building new knowledge.					
	1 – 4 Limited	5 – 8 Emerging	9 – 12 Ready to Teach	13 – 16 Exceeds Readiness	NO Opportunity To Demonstrate
5a: verifies that secondary students demonstrate conceptual understanding; procedural fluency; the ability to formulate, represent, and solve problems; logical reasoning and continuous reflection on that reasoning; productive disposition toward mathematics; and the application of mathematics in a variety of contexts within major mathematical domains.		Plans to look for evidence of student learning as described at the left.	Verifies that secondary students demonstrate conceptual understanding; procedural fluency; the ability to formulate, represent, & solve problems; logical reasoning & continuous reflection on that reasoning; productive disposition toward mathematics; & the application of mathematics in a variety of contexts within major mathematical domains.	Demonstrates the behaviors of a candidate "ready to teach." Based on the verified evidence of student demonstration of learning as described at the left, candidate adjusts his/her teaching during the lesson.	

<u>5b</u> : Engages students in developmentally appropriate mathematical activities and investigations that require active engagement and includes mathematical-specific technology in building new knowledge.		Attempts to engage students in developmentally appropriate math activities.	Engages students in developmentally appropriate math activities & investigations that require active engagement & includes math-specific technology in building new knowledge.	Demonstrates the behaviors of a candidate "ready to teach." Continues to seek improved ways to meet the students' needs as math learners & users, including new math-specific technology as they become available.	
<u>5c</u> : Collects, organizes, analyzes, and reflects on diagnostic, formative and summative assessment evidence and determines the extent to which students' mathematical proficiencies have increased as a result of their instruction.		Gathers data to evaluate student learning. The data and analysis focus on test scores.	Collects, organizes, analyzes, & reflects on diagnostic, formative & summative assessment evidence & determines the extent to which students' mathematical proficiencies have increased as a result of their instruction.	Demonstrates the behaviors of a candidate "ready to teach." Uses his/her analysis of student learning to adjust subsequent planning & teaching.	

Standard 9 & 10

PROFESSIONAL KNOWLEDGE & SKILLS

6—Effective teachers of secondary mathematics are lifelong learners and recognize that learning is often collaborative. They participate in professional development experiences specific to mathematics and mathematics education, draw upon mathematics education research to inform practice, continuously reflect on their practice, and utilize resources from professional mathematics organizations.					
	1 – 4 Limited	5 – 8 Emerging	9 – 12 Ready to Teach	13 – 16 Exceeds Readiness	NO Opportunity To Demonstrate
<u>6a</u> : Takes an active role in his/her professional growth by participating in professional development experiences that directly relate to the learning & teaching of mathematics.		Looks for professional development opportunities to improve teaching.	Takes an active role in his/her professional growth by participating in professional development experiences that directly relate to the learning & teaching of mathematics.	Demonstrates the behaviors of a candidate "ready to teach." Takes the lead to share PD learning with colleagues.	
<u>6b</u> : Engages in continuous and collaborative learning that draws upon research in mathematics education to inform practice; enhances learning opportunities for all students' mathematical knowledge; involves colleagues, other school professionals, families, and various stakeholders; and advances his/her development as a reflective practitioner.		Engages in continuous & collaborative learning that draws upon research in mathematics education to inform practice.	Engages in continuous & collaborative learning that draws upon research in math education to inform practice; enhances learning opportunities for all students' math knowledge; involves colleagues, other school professionals, families, & various stakeholders; & advances his/her development as a reflective practitioner.	Demonstrates the behaviors of a candidate "ready to teach." Candidate's pedagogy continues to develop as he/she explicitly applies this learning to enhance students' mathematical knowledge.	
<u>6c</u> : Utilizes resources from professional mathematics education organizations such as print, digital, and virtual resources/collections.		Looks for resources from professional math education organizations.	Utilizes resources from professional math education organizations such as	Demonstrates the behaviors of a candidate "ready to teach." Seeks	

			print, digital, and virtual resources/collections.	to be "up-to-date" as a math educator.	
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Standard 9 & 10