**­­Assessment 4 – Student Teaching Rubric Math**

**NCTM standards 2A, 2B, 2C, 2D, 3A, 3B, 3C, 3E, 3F, 3G, 4B, 4C, 4D, 4E, 5A, 5C, 6A, 6B, 7C**

ST RUBRIC Math

3= target met.

2= target met, but developing

1= target developing but NOT met

N/A=not observed at all- item missing. Evidence of standard completely missing from the lessons/instruction/observations.

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|  | 3 | 2 | 1 |
| **2a.1)** Use problem solving to develop conceptual understanding. | Use problem solving to develop conceptual understanding with scaffolded questions and maintain the cognitive complexity of the task with those questions. | Use problem solving to develop conceptual understanding with scaffolded questions and the intent to maintain the cognitive complexity of the task but the candidate asks leading questions. | Use of problem-solving to develop conceptual understanding is limited or unclear. Teacher questions directly guide students to the solution. |
| **2a.2)** Use problem solving to ... make sense of a wide variety of problems and persevere in solving them. | Creates opportunities to showcase a variety of students’ problem-solving strategies and encourages students to make sense of problems and persevere in solving them. | Encourages students to make sense of problems and persevere in solving them with a variety of problem-solving strategies. | Does not encourage students to make sense of problems and persevere in solving them and only one strategy is used in the classroom. |
| **2a.3)** Use problem solving to … …apply and adapt a variety of strategies in solving problems confronted within the field of mathematics and other contexts. | Planning includes opportunities for students to be engaged in problem solving activities within the field of mathematics and other contexts such as making connections to real world situations. Connections to real world contexts are student driven. | Planning includes opportunities for students to participate in problem solving activities within the field of mathematics. The candidate provides the examples or leading questions to help students make connections to real-world contexts. | Planning includes opportunities for students to participate in problem solving activities within the field of mathematics but there are not examples of connections to real-world contexts. |
| **2a.4)** Use problem solving to … …formulate and test conjectures in order to frame generalizations. | Planning includes mathematical activities that allow for students to formulate and test conjectures in order to frame generalizations. | Planning includes mathematical activities that allow for student discovery and with candidate’s guidance, students formulate and test conjectures in order to frame generalizations. | Planning includes mathematical activities that could allow for student discovery but the candidate leads the discussion and demonstrates a generalization. |
| **2b.1)** Reason abstractly, reflectively, and quantitatively with attention to units, constructing viable arguments and proofs, and critiquing the reasoning of others; | Reasons abstractly, reflectively, and quantitatively with attention to units, constructing viable arguments and proofs, and critiquing the reasoning of others. Candidate encourages students to critique the reasoning of others.  There is clear evidence that students critique the reasoning of others. | Reasons abstractly, reflectively, and quantitatively with attention to units, constructing viable arguments and proofs, and critiquing the reasoning of others.  Candidate encourages students to critique the reasoning of others. | Communicates mathematical reasoning using inappropriate strategies for flawed arguments. Mathematical arguments are vague or not precise.  No attempt is made for students to critique the reasoning of others. |
| **2b.2)** Represent and model generalizations using mathematics. Recognize structure and express regularity in patterns of mathematical reasoning | Represents and models generalizations using mathematics while providing opportunities for students to recognize patterns of mathematical reasoning. | Represents and models generalizations using mathematics while recognizing patterns of mathematical reasoning for the students. | Attempts to represent and model generalizations using mathematics. Incorrect or misleading models or incorrect generalizations are used. |
| **2b.3)** Use multiple representations to model and describe mathematics; | Uses multiple representations to model and describe mathematics using a variety of representations and recognizes and clarifies the connections between representations. | Uses multiple representations to model and describe mathematics using representations but no attempt is made to recognize the connections between the various representations. | Communicate mathematical ideas using a single representation. |
| **2b.4)** Utilize appropriate mathematical vocabulary and symbols to communicate Mathematical ideas to others. | Uses appropriate vocabulary and symbols to communicate mathematical ideas to others and clearly communicates to students that they are expected to communicate their reasoning using precise mathematical vocabulary in either written or spoken form. | Uses appropriate vocabulary and symbols to communicate mathematical ideas to others. | Most but not all vocabulary and symbols are used correctly to communicate mathematical ideas to others. |
| 2c.1) Formulate and represent, mathematical models derived from real-­‐world contexts or mathematical problems. | Designs experiences that allow students to formulate and represent mathematical models derived from a variety of real-world contexts to build mathematical understanding. | Candidate motivates or illustrates the formulation and representation of mathematical models derived from a limited set of real-world contexts. | Candidate illustrates the representation of a mathematical model. The context appears contrived. |
| 2c.2) Analyze, and interpret mathematical models derived from real-­‐world  contexts or mathematical problems. | Designs experiences that allow students to analyze and interpret mathematical models derived from a variety of real-world contexts to build mathematical understanding. | Candidate motivates or illustrates the analysis and interpretation of mathematical models derived from a variety of real-world context. | Candidate analyzes or interprets mathematical models. The context appears contrived. |
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| 2d) Organize mathematical thinking and use the language of mathematics to express ideas precisely, both orally and in writing to multiple audiences. | Organizes mathematical thinking and uses the language of mathematics to express ideas precisely to multiple audiences such as to peers, teachers, and all students. | Organizes mathematical thinking and uses the language of mathematics express ideas to most of the students. | Organizes mathematical thinking. Uses imprecise language of mathematics. |
| **3a)** Apply knowledge of curriculum standards for secondary mathematics and their relationship to student learning within and across mathematical domains. | Instruction applies knowledge of mathematics curriculum standards for secondary mathematics within and across mathematical domains with clearly matched learning outcomes using an investigatory approach. | Instruction applies knowledge of mathematics curriculum standards for secondary mathematics within and across mathematical domains. | Instruction applies knowledge of mathematics curriculum for secondary mathematics within or across mathematical domains but the goals of instruction are vague and unclear or not appropriate. |
| 3b) Analyze and consider research in planning for and leading students in rich  mathematical learning experiences. | Instruction analyzes and considers research and planning for mathematics instruction and incorporates research-based methods when leading students in rich mathematical experiences and the cognitive complexity of the task is always maintained. | Instruction analyzes and considers research and planning for mathematics instruction. Attempts are made to lead students in rich mathematical experiences but the cognitive complexity of the task is not always maintained. | Instruction analyzes and considers research and planning for mathematics instruction. Attempts are made to lead students in rich mathematical experiences but the cognitive complexity of the task is not maintained and the teacher always gives the answer. |
| **3c.1)** Plan lessons and units that incorporate a variety of strategies, differentiated instruction for diverse populations. | Instruction includes a variety of instructional strategies differentiated for all diverse populations. | Instruction includes 2 instructional strategies differentiated for most diverse populations. | Lesson plan includes one instructional strategy that could be differentiated for diverse populations. |
| **3c.2)** Plan lessons and units that incorporate mathematics-specific and instructional technologies in building all students’ conceptual understanding and procedural proficiency. | Instruction appropriately incorporates mathematics-specific technology and instructional technologies and builds all students’ conceptual understanding and procedural proficiency through the use of multiple opportunities and solution avenues. | Instruction appropriately incorporates mathematics specific technology and instructional technologies in an attempt to build most students’ conceptual understanding and procedural proficiency. | Instruction appropriately incorporates mathematic specific technology in an attempt to build students’ conceptual understanding or procedural proficiency, or only uses one avenue for students to demonstrate conceptual understanding and procedural proficiency. |
| 3e.1) Implement techniques related to student engagement and communication including  selecting high quality tasks, guiding mathematical discussions, identifying key mathematical ideas, identifying and addressing student misconceptions. | Implements techniques for actively engaging students in learning and doing mathematics by selecting high quality tasks and guides productive mathematical discussions centered on key mathematical ideas and applies instructional techniques that assist in identifying and addressing student misconceptions. Uses students’ misconceptions as opportunities for learning. | Implements techniques for actively engaging students in learning and doing mathematics by selecting high quality tasks and attempts to guide productive mathematical discussions centered on key mathematical ideas and attempts to apply instructional techniques that assist in identifying and addressing student misconceptions. | Implements techniques for actively engaging students in learning and doing mathematics by selecting high quality tasks and attempting to apply instructional techniques that assist in identifying and addressing student misconceptions. |
| 3e.2) Implement techniques related to student engagement and communication including and employing a range of questioning strategies. | Employs a variety of questioning strategies including accessing procedural proficiency and conceptual understanding and using both lower order and higher order questions, asking open-ended questions, and allowing students to explain their reasoning in their own words and re-voice the mathematical thinking of others. | Employs two questioning strategies including accessing procedural proficiency or conceptual understanding and using at least one of the following: both lower order and higher order questions, asking open-ended questions, and allowing students to explain their reasoning in their own words and re-voice the mathematical thinking of others. | Employs one questioning strategy including accessing procedural proficiency or conceptual understanding. |
| **3f.1)** Plan, select, implement, interpret, and use formative and summative assessments to inform instruction by reflecting on mathematical proficiencies essential for all students. | Plans, selects, and implements formative and summative assessments to effectively measure mathematical proficiencies for all students.  Evidence of implementing task, questions, evidence (TQE) lesson planning process (Nolan). Relevant questions are used as a formative assessment. Other written evidence is used as a formative and summative assessment. | Lesson plans are designed with formative and summative assessments to effectively measure mathematical proficiencies for most students.  Evidence of implementing task, questions, evidence (TQE) lesson planning process (Nolan). Relevant questions are used as a formative assessment. Other written evidence is used as a formative and summative assessment. | Lesson plans are designed with formative or summative assessments to effectively measure mathematical proficiencies for some students. |
| **3f.2)** Implement, interpret, and use formative and summative assessments to inform instruction by reflecting on mathematical proficiencies essential for all students. | Plans, selects, and implements a variety of formative and summative assessments effectively implemented to inform instruction by reflecting on mathematical proficiencies for all students. Implements assessment results for subsequent instructional planning for all students. | Plans, selects, and implements a variety of formative and summative assessments effectively implemented to inform instruction by reflecting on mathematical proficiencies for most students. Implement assessment results for subsequent instructional planning for most students. | One formative or summative assessment implemented to inform instruction for only some students. |
| 3g) Monitor students’ progress, make instructional decisions, and measure students’ mathematical understanding and ability using formative and summative assessments. | Implements techniques that monitor all students’ progress using a variety of assessment tools, and makes effective instructional decisions that gauge advancement towards the learning outcomes, and demonstrates the ability to use, modify and/or design both formative and summative assessments, and design assessment processes that distinguish among developmental levels of students’ mathematical knowledge and skills. | Implements techniques that monitor most students’ progress using a variety of assessment tools, and makes effective instructional decisions that gauge advancement towards the learning outcomes, and uses both formative and summative assessments to measure students’ mathematical understanding and ability. | Implements techniques that monitor some students’ progress using one assessment tool, and uses either formative or summative assessments to measure students’ mathematical understanding and ability. |
| **4b.1)** Plan and create **sequential learning opportunities** grounded in mathematics education research in which students are actively engaged in building new knowledge from prior knowledge and experiences. | Instruction includes sequenced learning opportunities grounded in mathematics education research in which all students are actively engaged. New and appropriate mathematical knowledge is being built consistently for all students. | Instruction includes sequenced mathematics learning opportunity grounded in education research in which most students are mostly engaged. New and appropriate mathematical knowledge is being built for most students. | Instruction includes one learning opportunity in which less than half of the students are engaged. Little new and appropriate mathematical knowledge is being created. |
| **4b.2)** Plan and create developmentally appropriate, and **challenging learning opportunities** grounded in mathematics education research in which students are actively engaged in building new knowledge from prior knowledge and experiences. | Instruction incorporates developmentally appropriate and challenging learning opportunities where all students are actively engaged in building new knowledge from prior knowledge and experiences. | Instruction incorporates appropriate learning activities where most students are actively engaged in building new knowledge from prior knowledge or experiences. The chosen activity even though appropriate may not be challenging for all. | Instruction incorporates learning activities where some students are engaged but the lesson may fail to build upon knowledge from prior knowledge or experiences. |
| 4c.1) Incorporate knowledge of **individual differences** that exists within classrooms as a means to motivate and engage students. | Instruction incorporates knowledge of all individual differences that exists within the classroom to motivate and engage students, | Instruction incorporates knowledge of most of the individual differences in the cultural. | Instruction incorporates limited knowledge of the individual differences in the that exists within the classroom. |
| 4c.2) Incorporate knowledge of the **language diversity** that exists within classrooms as a means to motivate and engage students. | Instruction incorporates knowledge of all the language diversity that exists within the classroom to motivate and engage students.  Instruction emphasizes the acquisition of academic language as specified in the lesson plans with the intent that all students are working towards using that vocabulary orally and in writing in a meaningful context. | Instruction incorporates knowledge of most of the language diversity that exists within the classroom to motivate and engage students,  Instruction emphasizes the acquisition of academic language as specified in the lesson plans with the intent that most students are working towards using that vocabulary orally and in writing in a meaningful context. | Instruction incorporates limited knowledge of the language diversity that exists within the classroom to motivate and engage students.  Instruction only sometimes emphasizes the acquisition of academic language as specified in the lesson plans with the intent that only a few students are working towards using that vocabulary orally and in writing in a meaningful context. |
| 4c.3) Incorporate **culturally relevant perspectives** as a means to motivate and engage students. | Instruction incorporates knowledge of culturally relevant perspectives as means to motivate and engage students and incorporates resources related to cultural, ethnic, linguistic, gender, and learning differences in their teaching.  Candidate explicitly models appreciation of cultural diversity.  Candidate provides many contextual representations that represent a wide variety of cultures, ethnic groups, geographic regions, and social roles. | Instruction incorporates knowledge of culturally relevant perspectives as means to motivate and engage students and incorporates resources related to cultural, ethnic, linguistic, gender, and learning differences in their teaching.  Candidate is beginning to model an appreciation for diversity and has made attempts to teach students to an appreciation of diversity.  Candidate provides some contextual representations that represent various cultures, ethnic groups, geographic regions, and social roles. | Instruction incorporates limited knowledge culturally relevant perspectives that exists within the classroom to motivate and engage students.  Candidate pays little attention to culturally relevant perspectives. |
| **4d)** Demonstrate equitable and ethical treatment of and high expectations for all students during observation and by host teacher. | Demonstrates equitable and ethical treatment and high expectations for all students during observation and by host teacher.  Candidate exhibits persistence and tenacity in helping all students reach full potential. | Demonstrates equitable and ethical treatment and high expectations for most students during observation or by host teacher. | Demonstrates equitable or ethical treatment or high expectations that are extended to only some students. |
| **4e.1)** Apply 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). | Candidate consistently chooses appropriate tools and technologies, and students are actively engaged in their use of the tool.  Candidate demonstrates a wide variety of such tools. | Candidate chooses appropriate tools and technologies at a demonstration level. Students copy the teachers' use of appropriate tools.  Candidate demonstrates the use of 2-3 such tools. | The tool selected does not clearly relate to mathematical content and/or pedagogical knowledge. The tool may appear to be selected randomly or used as a demonstration only or is an inappropriate game.  Candidate demonstrates the use of only 1 such tool. |
| **4e.2)** Apply mathematical content and pedagogical knowledge to make sound decisions about when such tools in (4e.1) to enhance teaching and learning, recognizing both the insights to be gained and possible limitations of such tools. | Instruction demonstrates an ability to apply mathematical content and pedagogical knowledge to make sound decisions about when instructional tools enhance teaching and learning.  Candidate consistently recognizes and can clearly articulate to the host teacher and supervisor both the insights to be gained and possible limitations of selecting such tools. | Instruction demonstrates an ability to apply mathematical content and pedagogical knowledge to make sound decisions about when instructional tools enhance teaching and learning.  Candidate recognizes the insights to be gained or possible limitations of selecting such tools but needs assistance in articulating the choices. | Instruction demonstrates the ability to use instructional tools to possibly enhance teaching and learning but fails to recognize the insights to be gained or possible limitations of selecting such tools. |
| **IMPACT ON STUDENT LEARNING** | | | |
| 5a.1) Verify that secondary students demonstrate conceptual understanding; procedural fluency. | Instruction includes multiple pieces of evidence that students demonstrate conceptual understanding and procedural fluency. | Instruction includes one piece of evidence that students demonstrate conceptual understanding and procedural fluency. | Instruction includes one piece of evidence that students demonstrate conceptual understanding or procedural fluency. |
| 5a.2) Verify that secondary students demonstrate the ability to formulate, represent, and solve problems; logical reasoning and continuous reflection on that reasoning. | Instruction includes multiple pieces of evidence that students demonstrate the ability to formulate, represent, and solve problems and that related logical reasoning and continued reflection on that reasoning is appropriate. | Instruction includes one piece of evidence that students demonstrate the ability to formulate, represent, and solve problems, and that the students exhibit some continued reflection on that reasoning. | Instruction includes one piece of evidence that the students demonstrate the ability to formulate or represent or solve problems, but that students do not reflect on that reasoning. |
| 5a.3) Verify that secondary students demonstrate productive disposition toward mathematics; and the application of mathematics in a variety of contexts within major mathematical domains. | Instruction includes evidence that secondary students demonstrate productive disposition towards mathematics and that they are able to apply mathematics in a variety of contexts within major mathematical domains and students can articulate on their own how to apply the mathematics. | Instruction includes evidence that secondary students demonstrate productive disposition towards mathematics and that they are able to apply mathematics in two contexts within major mathematical domains, and students can articulate with the candidates help how to apply the mathematics. | Instruction includes one piece of evidence that secondary students demonstrate productive disposition towards mathematics. |
| **5c)** Collect, organize, analyze, and reflect on diagnostic, formative, and summative assessment evidence and determine the extent to which students’ mathematical proficiencies have increased as a result of their instruction. | Instruction and post observation interviews provide evidence that the candidate collected, organized, analyzed and reflected on diagnostic, formative and summative assessments and determined the extent to which all students’ mathematical proficiencies have increased as a result of their instruction. Assessment results are accurately interpreted and described how the assessment evidence will inform future instruction.  Data on student learning is clearly displayed and organized by student learning outcomes. Data analysis determines the extent to which students mathematical proficiencies have increased as a result of their instruction including an oral or written reflection on how the assessment evidence will inform future instruction. | Instruction and post observation interviews provide evidence that the candidate collected, organized, analyzed and reflected on diagnostic, formative and summative assessments and determined the extent to which most students’ mathematical proficiencies have increased as a result of their instruction. Assessment results are accurately interpreted.  Data on student learning is displayed. Data analysis determines the extent to which most students’ mathematical proficiencies have increased as a result of their instruction. | Instruction and post observation interviews provide weak evidence that the candidate collected, organized, analyzed and reflected on diagnostic, formative and summative assessments but the candidate did not reflect upon and determine the extent to which students’ mathematical proficiencies have increased as a result of their instruction. Assessment results are inaccurately or incompletely interpreted. |
| 6a) Take an active role in their professional growth by participating in professional development experiences that directly relate to the learning and teaching of mathematics. | Teacher candidate takes a highly active role in their professional growth by participating in (and then implementing within lesson planning) a variety of professional development experiences that directly relate to the learning and teaching of mathematics such as a face-to-face conference or other professional development for mathematics teachers or STEM education, or a live webinar specifically related to mathematics education. | Teacher candidate takes a role in their professional growth by participating in (and then implementing within lesson planning) one professional development experience that directly relates to the learning and teaching of mathematics such as the replay of a webinar specifically related to mathematics education. | Teacher candidate takes a role in their professional growth by participating in (and then implementing within lesson planning) one professional development experience but the experience is not related to the learning and teaching of mathematics. |
| **6b.1)** Engage in continuous and collaborative learning that draws upon research in mathematics education to inform practice; enhance learning opportunities for all students’ mathematical knowledge development. | Engages in continuous and collaborative learning (and then implemented within lesson planning) that draws heavily upon research and mathematics education through the use of multiple sources to inform practice and enhances learning opportunities for all students’ mathematical knowledge development. | Engages in continuous and collaborative learning (and then implemented within lesson planning) that draws upon research and mathematics education through the use of one source to inform practice and enhances learning opportunities for most students’ mathematical knowledge development. | Engages in intermittent learning (and then implemented within lesson planning) that draws upon some research in mathematics education through use of one source to inform practice attempts to enhance learning opportunities for students. |
| **6b.2)** Engage in continuous and collaborative learning that enhances learning opportunities for all students’ mathematical knowledge development and advances their development as a reflective practitioner. | Engages in continuous and collaborative learning (and then implemented within lesson planning) that enhances multiple learning opportunities for all students’ mathematical knowledge development to advance their own development as a highly reflective practitioner. | Engages in mostly continuous and collaborative learning (and then implemented within lesson planning) that enhances learning opportunities for most students’ mathematical knowledge development to advance their own development as a reflective practitioner. | Engages in some collaborative learning (and then implemented within lesson planning) that enhances some learning opportunities for less than half of the students’ mathematical knowledge development. |
| **6b.3)** Engage in continuous and collaborative learning that involves colleagues, other school professionals, families, and various stakeholders. | Engages in continuous and collaborative learning that involves frequent contact with multiple colleagues, other school professionals, families, and various stakeholders. | Engages in mostly continuous and collaborative learning that involves some contact with colleagues, other school professionals, families or various stakeholders. | Engages in intermittent collaborative learning that involves a few limited colleagues. |
| **7c)** Develop knowledge, skills, and professional behaviors across both middle and high school settings; examine the nature of mathematics, how mathematics should be taught, and how students learn mathematics; and observe and analyze a range of approaches to mathematics  teaching and learning, focusing on tasks, discourse, environment, and assessment. | Observations provide robust evidence the teacher candidate has developed knowledge, skills and professional behaviors across both middle and high school settings. Candidate can articulate how mathematics should be taught and how students learn mathematics. Candidates observed and analyzed a wide range of approaches to mathematics teaching and learning focusing on tasks, a wide variety of questions, and evidence of student learning.  Evidence documents ways in which the teacher candidate drew upon research and mathematics education and professional development in mathematics education to inform practice. | Observations provide evidence the teacher candidate has developed knowledge, skills and professional behaviors across both middle and high school settings. Candidate can articulate how mathematics should be taught and how students learn mathematics. Candidates observed and analyzed a range of approaches to mathematics teaching and learning focusing on tasks, a variety of questions, and evidence of student learning. | Observations provide some evidence that the teacher candidate has developed knowledge, skills, and professional behaviors but the evidence is from only one of middle school or high school. |

Assess the student teacher’s performance on the skills, dispositions, and behaviors indicated below. These reflect SUNY Oswego’s School of Education Conceptual Framework.

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| **Professionalism.** The teacher understands the ethical, moral, and legal complexities of schooling and the professional behaviors and dispositions expected of educators as delineated by institutional, school district, state and national standards, and has developed and acts upon a complementary set of values in relation to ethical, moral, and legal issues. |  | | |
| - Attendance and punctuality | 2 | 1 | 0 |
| - Communication and collaboration with cooperating teacher | 2 | 1 | 0 |
| - Timeliness of lesson planning and task completion | 2 | 1 | 0 |
| - Interactions with students | 2 | 1 | 0 |
| - Interactions with professional staff, faculty, and administrators | 2 | 1 | 0 |
| - Recordkeeping | 2 | 1 | 0 |
| **Instructional Technology.** The teacher identifies appropriate opportunities and skillfully uses a variety of effective instructional technologies to encourage students’ development of critical thinking, problem solving, and performance skills. | 2 | 1 | 0 |
| **Leadership and Collaboration.** Demonstrates commitment to working with cooperating teachers and other school professionals in a shared leadership role to support student learning. | 2 | 1 | 0 |

Comments about strengths:

Comments about target areas for growth and/or improvement:

Cooperating Teacher’s Signature:

Date

Student Teacher’s Signature:

Supervisor’s Signature: Date

Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_