**SCHOOL OF EDUCATION · SUNY OSWEGO**

Teacher Work Sample
Guidelines Mathematics Education- Revised September 2012

Guidelines for Preparation & Rubric

**What is a Teacher Work Sample?**

A Teacher Work Sample (TWS) is a product that demonstrates your ability to plan, deliver, and assess a standards based instructional sequence; document student performance; and reflect upon the effects of your instruction on student learning. Through your Teacher Work Sample, you will provide evidence of your performance relative to the following standards:

**1 Learning-Teaching Contextual Factors:** The candidate uses information about the learning/teaching context and student individual differences to plan culturally-relevant instruction and assessments of student learning.

**2 Learning Goals & Objectives:** The candidate sets significant, challenging, varied and appropriate learning goals/objectives.

**3 Assessment Plan:** The candidate uses multiple assessment modes and approaches aligned with learning goals/objectives to assess student learning before, during and after instruction.

**4 Instructional Sequence:** The candidate designs instruction for specific learning objectives, student characteristics and needs, and learning contexts.

**5 Analysis of Student Learning:** The candidate uses assessment data to profile student learning and communicate information about student progress and achievement.

**6 Evaluation and Reflection:** The candidate analyzes the relationship between his or her instruction and student learning in order to improve teaching practice.

**Required Components and Format of the Teacher Work Sample**

Your Teacher Work Sample must include all six components listed above. Suggested page numbers (single spacing, double space between sections or paragraphs) for each section are provided; consult your instructor for more information.

If you submit your TWS as hard copy, it must be word-processed, **single-spaced**, and error-free; you should provide a Table of Contents that lists the sections of your Teacher Work Sample and the page numbers. If submitted as an e-copy, save your files –include your full name in the file name and by section using a numbered system: example 1.1 Learning-TeachingJohn Smith or 2.3 Learning goals John Smith. This method ensures your instructor knows who submitted the file when the file is opened, and also keys the instructor as to what order to read the files.

Your instructor will determine the number of lessons and the duration of the instructional sequence required for your Teacher Work Sample, however typically lessons cover 3 blocks or 6 (~45 min) periods- 5 lessons followed by a summative test. You will submit your Teacher Work Sample to your instructor by the deadline date listed in your course syllabus. Your Teacher Work Sample will be evaluated using the scoring rubric in this document.

1 Guidelines and rubric adapted in July 2002 and modified most recently in September, 2012 as a model for use in teacher education classes at SUNY Oswego, based on a similar document in use at Idaho State University, dated October 2001. The *Renaissance Partnership for Improving Teacher Quality* (http://fp.uni.edu/itq) has developed the TWS approach to documenting K-12 student learning with support from US Department of Education Title II funding.

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**1 Learning-Teaching Context** (approximately 2 pages)



In this section of your Teacher Work Sample, you must describe the context in which you teach including the culturally-relevant characteristics of the school, classroom, and students. The Learning-Teaching Context section of your Teacher Work Sample must incorporate your knowledge of individual differences; learner characteristics (e.g., race, class, gender, ability, linguistic community, etc); and the social, cultural, and physical environmental factors that impact learning and teaching. *You should describe only those factors in the learning-teaching context that directly impact your teaching and student learning. For each factor you describe, you must analyze how that factor impacts the teaching of your instructional sequence and your students’ learning.*

School characteristics. Provide a brief description of the school including the type of school and grade/subject configuration. (See New York State data at www.nysed.gov.) Then describe major characteristics of the school that impact your instructional planning, delivery, and assessment. You should include any district or state mandates, such as required texts, curricula, and content standards, services available in the school for students with special needs, and the culturally-relevant characteristics of the local neighborhood in which the school is located. *Remember, for each factor you describe, you must analyze how that factor impacts the teaching of your instructional sequence and your students’ learning.*

Classroom characteristics. Describe the classroom in which you are teaching the instructional sequence presented in your Teacher Work Sample. You should describe the classroom rules and routines, physical arrangements, grouping patterns, and scheduling that affect learning and teaching (e.g., push-ins, pull-outs, teaming, etc). *Again, for each factor you describe, you must analyze how that factor impacts the teaching of your instructional sequence and your students’ learning.*

Student characteristics. Describe the students in the classroom including the number of students and their ages and gender, cultural and socioeconomic backgrounds, native language(s) and levels of English proficiency, range of abilities, and special needs. *Remember, for each factor you describe, you must analyze how that factor impacts the teaching of your instructional sequence and your students’ learning.*

**2 Learning Goals/Objectives** (approximately 1-2 pages)



In this section of your Teacher Work Sample, you must list the learning goals/objectives that guide the planning, delivery, and assessment of your instructional sequence in the left hand column of the chart on the next page. The objectives associated with each goal must clearly define what you expect students to know and be able to do as a result of the instructional sequence. The instructional sequence you use for your Teacher Work Sample must include goals and observable learning outcomes addressing the following areas: (1) content and (2) at least one attitude or dispositional goal. Some goals must be at the application or higher level of Bloom’s taxonomy. Definitions of the areas and sample achievement goals/objectives are available from your instructor.

This section of your Teacher Work Sample must also present a narrative rationale for selecting the learning goals/objectives for your instructional sequence. In your rationale, you must identify how your learning goals/objectives incorporate important ideas and accurate content that are linked to national standards.

**3 Assessment Plan** (approximately 2-3 pages)



In this section of your Teacher Work Sample, you must design an assessment plan used to monitor student progress toward the learning goals/objectives, and summarize your plan in a chart. You should include at least one assessment measure for assessing student content understanding **before instruction** (pre-assessments) and **after instruction** (post or summative assessments). You should also include a variety of assessments including embedded assessment for each lesson through a set of questions asked in each lesson. These assessments should correlate to the developmental levels and individual needs of all students in your classroom, and reflect sound practice with clear, high expectations for performance.

Assessment methods must be varied and may include paper-and-pencil assessments (i.e., multiple-choice tests and quizzes, written problems, etc.); performance assessments (i.e., building 3-D figures, or using dynamic software, etc); and personal communications (i.e., questions posed and answered during instruction). The key to writing this section of your Teacher Work Sample is the alignment between your learning goal/objectives and your assessment methods. Your chart should list each goal/objective; the assessment(s) used to describe student performance; a rationale for each assessment that explains why you chose or developed the assessment; and any adaptations of the assessments for the individual differences and special needs of the students in your classroom, using the format below.

[You must include copies of the individual lesson’s assessments (with solutions filled in) in *each lesson* *plan*.]

DURING STUDENT TEACHING:

1. One assessment must be a pre-and post-assessment of student learning relative to one of your content objectives. You should plan to record scores on pre- and post-tests from at least one class (minimum of 15-20 students) to make reasonable inferences about student learning. For your first assessment, you should plan to photocopy multiple examples from students at high, average, and low levels of performance for analysis; you will select a few representative examples to include in your Analysis of Student Learning section below.
2. The other assessment *could* [not required] be an alternative assessment of a higher-order thinking skill objective. Give a brief rationale for why you chose this second assessment.

3. Copy of pre-/post-tests (with answers filled in). Post Test must include one extended response and it is assumed the state scoring rubric is the rubric used.

*If you include* another alternative assessment to assess your broad goals, include the alternative assessment and the rubric.

**Chart in Support of Standards 2 & 3:**



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| **Goals/Standards (In the individual lesson plan you will write a behavioral/learning objective)** | **Assessments & Performance Criteria**  | **Rationale**  | **Planning for Accessibility/Adaptations**  |
| Describe or list **3-4 *key*** domains, clusters, then performance indicators from the CCSS. | Pre- and post-assessment of content understanding Other kinds of assessments…  | Why you chose or developed each assessment for each goal/objective  | How you adapted each assessment for specific individual differences and special needs of students in your classroom (gifted, students with disabilities, ELL) |
| Describe 2-3 *key* mathematical practices. |  |  |  |
| Describe ONE attitudinal goal |  |  |  |
| Describe ONE technology goal |  |  |  |

\*\*see slide 12 in this link that matches the NCTM processes with the CCSS mathematical practices. All lesson plans from Fall 2012 will reference the CCSS. <http://ffennell.com/presentations/FennellCCSSPracticesandMore21stCenturyPartnershipJan2012.pdf>



This section of your Teacher Work Sample must include the required number of individual lesson plans for the learning activities in your instructional sequence. A learning activity can take many forms including, but not limited to, direct whole-group instruction, learning centers, teacher-directed activity, hands-on inquiry, small-group experiences, cooperative learning, etc. The learning activities in your Teacher Work Sample must *incorporate at least three different instructional strategies,* including one lesson using technology (spreadsheets, dynamic geometry, graphing calculator, etc), and one lesson using hands-on concrete materials. The specific format for writing a lesson plan is found at the end of this document.

Typically lessons cover 3 blocks or 6 (~45 min) periods- 5 lessons followed by one summative test. If your classroom instruction covers more than 5 lessons, choose five lessons (usually the first five) to include in the TWS followed by your summative assessment- meeting all criteria listed.

You must include copies of the project-based or pencil and paper assessments (with solutions filled in) in *each lesson* *plan*. You should word process assessments. You may fill in the answers in a different color, or hand write solutions and scan the pages to submit electronically.

Instructional sequence:

* Instructional sequence. Your instructional sequence should include all the examples/worksheets, activities, games you'll use for each lesson as well as the homework for each lesson. You can have a page of problems/content examples after your lesson plan. You should have one quiz/test (insert this in Section 2 Assessment plan) with answers of about 30-40 min in length.
* Answers should always be provided to individual lessons- you do not need a blank copy of assignments- provide a neatly completed answer key.
* **Begin** with a letter of introduction-Example of Community connections- -Write a letter to parents explaining how to contact you, what you are teaching, what info is available on the web.
* **Second,** place your mathematical “Problem of the Week.” This must be an example of problem solving where the answer is not obvious, and students persevere in solving the given problem.
* **Follow** with Lesson #1, etc.
* Must include one part of one lesson to a topic from History of Mathematics- this may or may not overlap with your multicultural connections.
* At least one lesson must use technology (graph calculator, spreadsheets, dynamic applets, etc)
* At least one lesson that uses hands-on concrete materials (you do not need to include the actual materials- a description or picture is fine.)
* Use assigned lesson plan format and include the questions!
* Include other community connections, multicultural connections *as appropriate.*

**5 Analysis of Student Learning with Examples of Student Work**



METHODS: You will comment on at least 3 *potential areas* of your lesson that might be difficult for students, common potential errors in computation, or other potential misconceptions.

STUDENT TEACHING: (approximately 1-2 pages, plus student work samples and any charts/graphs/tables created to support your analysis)

In this section of your Teacher Work Sample, you must provide a narrative summary, examples of student work, and graphs or charts to describe the student learning that occurred as a result of the instructional sequence. Your analysis of student learning should provide data for **at least two of the learning goals/objectives** addressed in the instructional sequence. You must analyze your data to report the performance of the whole class and subgroups of the class on a pre-assessment and post-assessment ( use preposttestanalysis.xls).

Whole class analysis. Present data for all the students in the class on a pre-assessment and post-assessment to draw conclusions about the extent to which the whole class attained at least one content objective addressed in the instructional sequence. Provide a graphic representation to compare pre- and post-assessment results and explain what the graph illustrates. Also describe and analyze student performance on one of your skill, attitude/disposition, or higher-order thinking objectives. Include representative examples of student work to support your analysis.

Subgroup analysis. Select a diversity characteristic that you expect to have an impact on student learning to analyze (e.g., gender, race, socioeconomic status, ability level, language proficiency, level of family support, etc). Form one or more student subgroup(s) based on that distinguishing characteristic. Explain why it is important to understand the learning of student in these subgroup(s) in relation to both of the learning objectives you have chosen to assess. Use the disaggregated achievement data from these subgroup(s) to draw conclusions about the extent to which student in these subgroup(s) attained both of your learning objectives. Provide a graphic representation to compare pre- and post-assessment results from these subgroup(s) as you did for the whole group above. Explain what the graph(s) and your other assessment data for these subgroup(s) illustrate about the learning of student in these subgroup(s) in comparison to the whole class.

Address the following:

Analyzes and reflects on diagnostic formative and summative assessments for student misconceptions and mathematical error patterns.

Draws appropriate and meaningful conclusions about the impact of instruction on learning for all students.

Analysis of assessment data clearly evidences the impact on and progress towards learning goals of whole class and individual students of varying performance/ability.

**6 Evaluation and Reflection** (approximately 1-2 pages)



For the final section of your Teacher Work Sample, you must write a reflective essay in which you evaluate the effectiveness of your instructional sequence and reflect on your teaching practice and its impact on student learning.

METHODS: (TWS not implemented). You must address the following questions:

* Were you able to implement the principles of culturally-relevant teaching in your instructional sequence? Provide examples where you think you could enhance this aspect of your teaching in the future.
* Develop a plan improve your knowledge and understanding of both content and mathematics education pedagogy with clearly defined steps to meet these goals, including a plan for continued participation in mathematics education professional organizations.
* Discuss the strengths and challenges of the chosen technology integration.

STUDENT TEACHING: You must address the following questions:

* Were the goals/objectives for your instructional sequence met? Provide evidence for your response.
* How did you change your planned instructional sequence as the lessons were actually taught (reflection in action)?
* How might you teach this instructional sequence differently if you were to do it again (reflection on action)- referencing knowledge of salient and current research results in mathematics education.
* Were you able to implement the principles of culturally-relevant teaching in your instructional sequence? Provide examples where you think you (1) were particularly successful and (2) could enhance this aspect of your teaching in the future?
* Develop a plan improve your knowledge and understanding of both content and mathematics education pedagogy with clearly defined steps to meet these goals, including a plan for continued participation in mathematics education professional organizations.
* Discuss the strengths and challenges of the technology integration.
* Make meaningful suggestions regarding technology implementation for the future that connect the technology and the learning objectives.

See the rubric.

**Teacher Work Sample Rating For Mathematics**

**SUNY Oswego**

Use the following rating scale to evaluate the teacher candidate’s performance on the Teacher Work Sample using the criteria indicated below. These criteria are aligned with NCTM Standards, a set of knowledge, dispositions, and performances deemed essential for beginning adolescence mathematics educators and the expectations that SUNY Oswego has for its Adolescence Mathematics Education teacher candidates.

3 = Met - The teacher candidate has demonstrated clear evidence of meeting the target criteria.

2 = Met, but still Developing - The teacher candidate demonstrates evidence toward meeting the target criteria, and meets it.

1 = Not Met, but showing signs of development - The teacher candidate does not demonstrate evidence of meeting the target criteria.

0 = No Credit - The teacher candidate has not demonstrated evidence of meeting the target criteria.

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| Criteria: The candidate… | Rating: |
|  *Section 1: Learning-Teaching Context* |
| 1a. NCTM 7.1 Demonstrates in-depth knowledge of the characteristics of the community, school and classroom that may affect student learning. | 3 2 1 0 |
| 1b. NCTM 7.1 Draws appropriate and specific conclusions regarding implications for teaching and learning.  | 3 2 1 0 |
| *Section 2: Learning Goals and Objectives* |
| 2a. NCTM 8.4 Demonstrates the ability to write clear learning goals and objectives; explains how these are explicitly aligned with national, state, or local standards and local curricular goals.  | 3 2 1 0 |
| 2b. NCTM 8.1 Develops goals and objectives with appropriate mathematics curricula that are appropriate for *all* learners including those with special needs such as the gifted, challenged and speakers of other languages. | 3 2 1 0 |
| *Section 3: Assessment Plan* |
| 3a. NCTM 7.5 Plans fair and equitable on-going assessment of learning goals and objectives through varied and well-aligned formative and summative assessments.  | 3 2 1 0 |
| 3b. NCTM 8.3 Uses assessment strategies that are valid for measuring the stated learning objectives; provides well-informed rationale consistent with national standards for the selected assessments and their design.  | 3 2 1 0 |
| 3c. NCTM 8.3 Uses assessment strategies that are designed to continuously evaluate misconceptions, including listening to and understanding the ways students think about mathematics. | 3 2 1 0 |
| 3d. NCTM 8.1 Explains how goals and objectives are responsive to the learners’ developmental characteristics, diversity, and prior skills, knowledge and experiences and adapted to meet the meet the needs of most students.  | 3 2 1 0 |
| *Section 4: Instructional Sequence* |
| 4a. NCTM 7.2 Plans lessons and activities using a variety of instructional strategies and stimulating curricula (based upon research results in the teaching and learning of mathematics) that are sequenced logically to move students towards achievement of the objectives. | 3 2 1 0 |
| 4b. NCTM 7.3 All lessons, learning activities and resources are aligned with learning objectives. All learning objectives are covered in the instructional sequence. |  3 2 1 0 |
| 4c. NCTM 8.4 Content is accurate. Focus of the content is congruent with the big ideas or structure of mathematics. | 3 2 1 0 |
| 4d. NCTM 8.2 All lessons within the unit are logically organized and appear to be useful in moving students toward achieving the learning objectives.  | 3 2 1 0 |
| 4e. NCTM 8.3 Selects and uses appropriate concrete materials for learning mathematics. | 3 2 1 0 |
| 4f. NCTM 8.8 Leads classes in mathematical problem solving and in developing in-depth conceptual understanding, and helps students develop and test generalizations.  | 3 2 1 0 |
| 4g. NCTM 8.5 Joins and participates in a professional mathematics organization, and uses print and on-line resources.  | 3 2 1 0 |
| 4h. NCTM 8.7 Uses a variety of instructional strategies throughout the unit plan. | 3 2 1 0 |
| 4i. NCTM 6.1 Uses knowledge of mathematics to *select* appropriate technological tools to build understanding of mathematical concepts and develop important mathematical ideas (such as but not limited to, spreadsheets, dynamic statistical packages, graphing calculators, data-collection devices, and presentation software.) | 3 2 1 0 |
| 4j. NCTM 6.1 Uses knowledge of mathematics to *implement* appropriate technological tools to facilitate instruction, build understanding of mathematical concepts and develop important mathematical ideas (such as but not limited to, spreadsheets, dynamic statistical packages, graphing calculators, data-collection devices, and presentation software.) | 3 2 1 0 |
| 4k. NCTM 8.9 Technologies selected are well aligned with curricular goals. | 3 2 1 0 |
| 4l. NCTM 7.2 Incorporates the historical development of mathematics including contributions from diverse cultures  | 3 2 1 0 |
| 4m. NCTM 7.1 Provides opportunities for teacher and student collaboration with other classrooms, families, and/or community members beyond the classroom.  | 3 2 1 0 |
| *Section 5: Analysis of Student Learning* |
| 5a. NCTM 7.5 Analyzes and reflects on diagnostic formative and summative assessments for student misconceptions and mathematical error patterns. | 3 2 1 0 |
| 5b. NCTM 8.3 Draws appropriate and meaningful conclusions about the impact of instruction on learning for all students. | 3 2 1 0 |
| 5c. NCTM 7.4 Analysis of assessment data clearly evidences the impact on and progress towards learning goals of whole class and individual students of varying performance/ability. | 3 2 1 0 |
| *Section 6: Evaluation and Reflection* |
| 6a. NCTM 8.3 Engages in on-going and critical reflection regarding the learning outcomes for all students. Suggested modifications in instruction congruent with learning goals, referencing knowledge of salient and current research results in mathematics education | 3 2 1 0 |
| 6b. NCTM 8.6 Strives to continuously to improve their knowledge and understanding of both content and mathematics pedagogy with clearly defined steps to meet these goals.  | 3 2 1 0 |
| 6c.NCTM 6.1Discusses the strengths and challenges of the technology integration. | 3 2 1 0 |
| 6d. NCTM 6.1Makes meaningful suggestions regarding technology implementation for the future that connect the technology and the learning objectives. | 3 2 1 0 |

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| Name: |  | Section Time: |  |  #: |  |

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| Educational Task: |
| Grade Level, approximate number of students, types of students: |
| Materials and Sources, including at least one NCTM resource in your TWS (in Methods this WILL be an article from Mathematics Teacher or Teaching Mathematics in the Middle School; in Student Teaching it may be an article or other web-based NCTM resource) |
| CCSS Math Performance Indicator(s) [PI]: (Give Domain, cluster then choose 1 or 2 specific PI)**CCSS Mathematical Practices (choose 2):****CCSS ELA Appendix for Technical Subjects, p. 75: (state 1 or 2)** |
| **Performance Objectives:** *State in the format, The students will demonstrate the ability to \_\_\_\_\_\_\_\_\_\_ [what you want the students to learn] by \_\_\_\_\_\_\_\_\_\_ [indicates how you know that the students learn the objective].* |
| General Safety Precautions or Lab safety protocols: |

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| Part of Lesson | **Teacher and Student Actions** | **Questions.** These can repeat for different parts of the lesson if appropriate. Include both lower order and higher order questions for each lesson. Include questions that indicate you have checked for understanding for **classroom procedures, and procedural and conceptual understanding.** |
| Launch/Anticipatory SetState prior knowledge needed, then explain how you will access prior knowledge and draw the students into this particular lesson.Also explain how you will launch the “problem” the students will solve during the explore. Some problems need more extensive launches than others. | **Teacher Actions:** **Student Actions:** |  |
| ExploreDescribe what the teacher will do and how the students will be engaged in the lesson/activity. | **Teacher Actions:** **Student Actions:** |  |
| Summary/ClosureDescribe how you will summarize the lesson. This is a most important part of a problem solving lesson where the students share their strategies. The teacher should facilitate the discussion and the students should be actively engaged. | **Teacher Actions:** **Student Actions:** |  |
| AssessmentClearly describe how the teacher will know if the students met the objective. Assessment should be embedded within the activities. The assessment may include a separate independent component. |  |
| Modification for Advanced Learners | Briefly describe here. DO NOT state that advanced learners will help others. You need a meaningful activity/extension of the lesson. |
| Modifications for one type of disability-state the name of the disability here.  | Briefly describe here. DO NOT state that learning disabled students will receive help from advanced learners. |
| Modifications for ELL. | Briefly describe here. DO NOT state that those learning English will receive help from other students. |

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| Reflection on the learning objectives.Appears once in TWS  | METHODS: You will comment on at least 3 *potential areas* of your lesson that might be difficult for students, common potential errors in computation, or other potential misconceptions.STUDENT TEACHING: (approximately 1-2 pages, plus student work samples and any charts/graphs/tables created to support your analysis) In this section of your Teacher Work Sample, you must provide a narrative summary, examples of student work, and graphs or charts to describe the student learning that occurred as a result of the instructional sequence. Your analysis of student learning should provide data for **at least two of the learning goals/objectives** addressed in the instructional sequence. You must analyze your data to report the performance of the whole class and subgroups of the class on a pre-assessment and post-assessment ( use file preposttestanalysis.xls). See TWS Rubric for full directions. |

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| Evaluation and Reflection You may delete the question set that does not pertain to you.Appears once in TWS | METHODS: (TWS not implemented in school setting). You must address the following questions: * Were you able to implement the principles of culturally-relevant teaching in your instructional sequence? Provide examples where you think you) could enhance this aspect of your teaching in the future. ?
* Develop a plan improve your knowledge and understanding of both content and mathematics education pedagogy with clearly defined steps to meet these goals, including a plan for continued participation in mathematics education professional organizations.
* Discuss the strengths and challenges of the technology integration.
* Make meaningful suggestions regarding technology implementation for the future.
* Were the goals/objectives for your instructional sequence met? Provide evidence for your response and reference knowledge of salient and current research results in mathematics education.

STUDENT TEACHING: You must address the following questions: * Discuss the strengths and challenges of the technology integration.
* Make meaningful suggestions regarding technology implementation for the future.
* Were the goals/objectives for your instructional sequence met? Provide evidence for your response and reference knowledge of salient and current research results in mathematics education.
* How did you change your planned instructional sequence as the lessons were actually taught (reflection in action)?
* Were you able to implement the principles of culturally-relevant teaching in your instructional sequence? Provide examples where you think you (1) were particularly successful and (2) could enhance this aspect of your teaching in the future.
* How might you teach this instructional sequence differently if you were to do it again (reflection on action)? Why?
* Develop a plan improve your knowledge and understanding of both content and mathematics education pedagogy with clearly defined steps to meet these goals, including a plan for continued participation in mathematics education professional organizations.
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