

GEORGE MASON UNIVERSITY
COLLEGE OF EDUCATION AND HUMAN DEVELOPMENT
GRADUATE SCHOOL OF EDUCATION
Mathematics Education Leadership

EDCI 646 DL1 or DL3: Mathematics Education Leadership for School Change
3 Credits, Fall 2014

DL3 – Tuesdays, 4:30-7:10, online (as noted in schedule)
DL1 – Wednesdays, 4:30-7:10, online (as noted in schedule)

PROFESSOR:

Name: Dr. Courtney Baker

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COURSE DESCRIPTION:

A. Prerequisites/Corequisites

Admission to the Mathematics Education Leadership Master's Degree Program or instructor permission.

B. University Catalog Course Description

Surveys current literature and large-scale studies in mathematics education. Engages students in research, study, and discussion of factors that affect teaching and learning of mathematics in school settings.

C. Expanded Course Description

This course is designed for master's level students in the mathematics education leadership cohort program.

DELIVERY METHOD:

This course will be delivered online using a **synchronous** format via the Blackboard learning management system (LMS) housed in the MyMason portal. You will log in to the Blackboard course site using your Mason email name (everything before "@masonlive.gmu.edu) and email password. The course site will be available on August 25, 2014.

The delivery of this course combines discussion, independent study, student group presentations, writing, and online meetings/assignments. Access to Blackboard and GMU email are required to participate successfully in this course. All communication and announcements from the instructor will be sent via Blackboard or to students' George Mason University email addresses.

In our online learning community, we must be respectful of one another. Please be aware that innocent remarks can be easily misconstrued. Sarcasm and humor can be easily taken out of

context. When communicating, please be positive and diplomatic. I encourage you to learn more about Netiquette.

Because of the online nature of the course, students need at minimum access to a computer with internet access, a microphone and headphones in order to participate in online class meetings effectively. More information about technology specifications can be found at <http://masononline.gmu.edu/faqs/> (the Online Learning site for George Mason University).

TECHNICAL REQUIREMENTS:

To participate in this course, students will need the following resources:

- Access to a Windows or Macintosh computer with at least 2 GB of RAM and to a fast, reliable broadband Internet connection (e.g., cable, DSL). For optimum visibility of course material, the recommended computer monitor and laptop screen size is 13-inches or larger. For the amount of computer hard disk space required to take an online course, consider and allow for the space needed to: 1) install the required and recommended software and, 2) save your course assignments.
- You will need computer speakers or headphones to listen to recorded content.
- A headset microphone for use with the Blackboard Collaborate web conferencing tool
- High-speed Internet access with a standard up-to-date browser, either Internet Explorer or Mozilla Firefox. Opera and Safari are not compatible with Blackboard;
- Consistent and reliable access to their GMU email and Blackboard, as these are the official methods of communication for this course. To access Blackboard Courses log into <http://mymason.gmu.edu>, select the Courses Tab.
- To access Blackboard Collaborate select Tools from the Blackboard Course Menu, then select Blackboard Collaborate.
- Students may be asked to create logins and passwords on supplemental websites and/or to download trial software to their computer or tablet as part of the course requirements.
- You will need access to Microsoft Office.
- For hardware and software purchases, visit [Patriot Computers](#).
- The following software plug-ins for PCs and Macs respectively, available for free downloading by clicking on the link next to each plug-in:
 - Adobe Acrobat Reader: <http://get.adobe.com/reader>
 - Windows Media Player: <http://windows.microsoft.com/en-US/windows/downloads/windows-media-player>
 - Apple QuickTime Player: www.apple.com/quicktime/download/
- **Note:** If you are using an employer-provided computer or corporate office for class attendance, please verify with your systems administrators that you will be able to install the necessary applications and that system or corporate firewalls do not block access to any sites or media types.

EXPECTATIONS:

- **Course Week:**
Our course week will begin on the day that our synchronous meetings take place as indicated on the Schedule of Classes.
- **Log-in Frequency:**
Students must log-in for all scheduled online synchronous meetings. In addition, students must actively check the course Blackboard site and their GMU email for communications from the instructor, at a minimum this should be 3 times per week.
- **Participation:** Students are expected to actively engage in all course activities throughout the semester, which include viewing of all course materials, completing course activities and assignments, and participating in course discussions and group interactions.
- **Technical Competence:** Students are expected to demonstrate competence in the use of all course technology. Students are expected to seek assistance if they are struggling with technical components of the course.
- **Technical Issues:** Students should expect that they could experience some technical difficulties at some point in the semester and should, therefore, budget their time accordingly. Late work will not be accepted based on individual technical issues.
- **Workload:** Expect to log in to this course **at least 3 times a week** to read announcements, participate in the discussions, and work on course materials. Remember, this course is **not** self-paced. There are **specific deadlines** and **due dates** listed in the **CLASS SCHEDULE** section of this syllabus to which you are expected to adhere. It is the student's responsibility to keep track of the weekly course schedule of topics, readings, activities and assignments due.
- **Advising:** If you would like to schedule a one-on-one meeting to discuss course requirements, content or other course-related issues, and you are unable to come to the Mason campus, we can meet via telephone or web conference. Send me an email to schedule your one-on-one session and include your preferred meeting method and suggested dates/times.
- **Netiquette:** Our goal is to be **collaborative**, not combative. Experience shows that even an innocent remark in the online environment can be misconstrued. I suggest that you always re-read your responses carefully before you post them to encourage others from taking them as personal attacks. **Be positive in your approach to others and diplomatic with your words.** I will do the same. Remember, you are not competing with each other but sharing information and learning from one another as well as from the instructor.

LEARNER OUTCOMES or OBJECTIVES:

This course is designed to enable students to:

- A. Develop skillful and flexible use of different instructional formats – whole group, small group, partner, and individual – in support of learning goals.
- B. Design, select, and/or adapt worthwhile mathematics tasks and sequence examples to support a particular learning goal.
- C. Construct and evaluate multiple representations of mathematical ideas or processes, establish correspondences between representations, and understand the purposes of doing so.
- D. Use questions to effectively probe mathematical understanding and make productive use of responses.
- E. Develop learners’ abilities to give clear and coherent public mathematical communications in a classroom setting.
- F. Manage diversities of the classroom and school –cultural, disability, linguistic, gender socio-economic, developmental – and use appropriate strategies to support the mathematical learning of all students.
- G. Analyze and evaluate student ideas and work, and design appropriate responses.
- H. Use professional resources such as professional organization networks, journals, and discussion groups to be informed about critical issues related to mathematics teaching and learning, e.g., policy initiatives and curriculum trends.
- I. Use leadership skills to improve mathematics programs at the school and district levels.
- J. Read, interpret, and discuss methodologies for implementing school change in mathematics education and for coping with the emotional aspects of change.
- K. Explore and discuss the various aspects of the work of a mathematics leader including: working with different populations (i.e., new and experienced teachers, administrators, parents, and school cultures); managing discussions; identifying and implementing structures for professional development (i.e., Lesson Study, Content-Focused Coaching, Professional Learning Communities); and transitioning into the role of a mathematics specialist.

(***Outcomes A – H are quoted directly from page 6-7 of the 2010 AMTE *Standards for Elementary Mathematics Specialists: A Reference for Teaching Credentialing and Degree Programs*)

PROFESSIONAL STANDARDS (Association of Mathematics Teacher Educators (AMTE)):

EDCI 646 is designed to enable mathematics education leaders to use strategies to implement and evaluate school change in mathematics teaching and learning. Students need knowledge of effective instruction in mathematics as well as vehicles for change so that they can be a catalyst for school improvement in mathematics. The course was developed according to the *Standards for Elementary Mathematics Specialists* of the Association of Mathematics Teacher Educators (AMTE, 2010).

REQUIRED TEXTS:

Felux, C. & Snowdy, P. (2006). *The math coach field guide: Charting your course*. Sausalito, CA: Math Solutions.

Lewis, C. & Hurd, J. (2011). *Lesson study step-by-step: How teacher learning communities improve instruction*. Portsmouth, NH: Heinemann.

West, L. & Staub, F. C. (2003). *Content-focused coaching: Transforming mathematics lessons*. Portsmouth, NH: Heinemann.

NOTE: The *Lesson Study Step-By-Step* (Lewis & Hurd, 2011) and *Content-focused coaching* (West & Staub, 2003) texts both include DVDs with video clips we will be using in class. Be sure your copy includes these materials with the book.

ADDITIONAL RESOURCES (Optional):

Andrews, D., & Lewis, M. (2002). The experience of a professional community: Teachers developing a new image of themselves and their workplace. *Educational Research*, 44, 237-254.

Cochran-Smith, M. & Lytle, S. (1999). The teacher research movement a decade later. *Educational Researcher*, 28(7), 15-25.

Evitts, T. A. (2004). Action research: A tool for exploring change. *Mathematics Teacher*, 97(5), 366-370.

Hatch, T., White, M. E., & Faigenbaum, D. (2005). Expertise, credibility, and influence: How teachers can influence policy, advance research, and improve performance. *Teachers College Record*, 107, 1004-1035.

Lewis, C., Perry, R., & Hurd, J. (2004). A deeper look at lesson study. *Educational Leadership*, 61(5), 18-22.

Lewis, C. C., & Tsuchida, I. (1998). A lesson is like a swiftly flowing river: How research lessons improve Japanese education. *American Educator*, 22(4), 12-17; 50-52.

Snow-Gerono, J. L. (2005). Professional development in a culture of inquiry: PDS teachers identify the benefits of professional learning. *Teaching and Teacher Education: An International Journal of Research Studies*, 21, 241-256.

Takahashi, A., & Yoshida, M. (2004). Ideas for establishing lesson-study communities. *Teaching Children Mathematics*, 10(9), 436-443.

COURSE ASSIGNMENTS AND EXAMINATIONS:

The assignments across the semesters are intended to develop skills in implementing, leading, and evaluating school change in mathematics teaching and learning. All assignments are to be

completed on time so that class members might benefit from the expertise and contributions of their colleagues. Late assignments will be worth a lower grade. ***Additional details and rubrics for all assignments will be posted on Blackboard. Please review these materials!***

1. Assignment descriptions

a. Introduction/Professional Development Autobiography – (10%)

The first assignment in the course will be used to introduce students to the class. A set of questions will be posted on the assignment sheet and students will create a blog page in Blackboard including a photo. Students will also need to comment on at least 3 entries posted by their peers in class.

b. Coaching Project—(40%)

For this assignment, participants will plan and videotape or audiotape a coaching cycle (one pre-conference and one post-conference) with a classroom teacher. Participants should *not* videotape the actual lesson that is taught by the classroom teacher. In addition to writing a summary report, participants will choose one uninterrupted clip from each conference and present these clips to a small group of their classmates. After discussing the clips with the small group, participants will develop a written summary of the important ideas related to mathematical pedagogy and mathematical content that surfaced during their own pre- and post-conferences. Each small group will also choose a representative clip (one pre- or post-conference clip) to discuss with the entire class. This project will be posted to Taskstream for the final evaluation.

c. Lesson Study Project – (40%)

Students will work with a small group to conduct a lesson study. This will include selecting research goals for the lesson, planning the lesson, teaching the lesson (by at least one person in the team), and reviewing artifacts from the lesson. This project will be posted to Taskstream for the final evaluation.

d. Reading Discussion Questions & Participation (20%)

The quality of this course depends heavily and primarily on the regular attendance and participation of all involved. Participation will include taking part in discussions informed by critical reading and thinking and sharing with the class the products of various reading/writing assignments and teacher leader experiences. As part of the reading, each student will be assigned to post discussion questions at least once during the semester connected to the reading for the week. In addition, students will need to post a comment responding to at least one of the discussion questions each week.

Attendance. It is your responsibility to attend all class sessions. Please report your reasons for any absences to the instructor in writing. Tardiness. It is your responsibility to be on time for each class session. Please report your

reasons for any tardiness to the instructor in writing. Class materials will be posted for each class session on Blackboard. Students are responsible for reviewing these materials and submitting required artifacts (where appropriate) to online class discussion boards.

	LEVEL OF PERFORMANCE			
ELEMENT	<i>Distinguished</i> (9 – 10 points)	<i>Proficient</i> (8 points)	<i>Basic</i> (6 - 7 points)	<i>Unsatisfactory</i> (1 - 5 points)
Attendance & Participation	The student attends all classes, is on time, is prepared and follows outlined procedures in case of absence. The student actively participates and supports the members of the learning group and the members of the class. Presentations demonstrate a deep knowledge of	The student attends all classes, is on time, is prepared and follows outlined procedures in case of absence; the student makes active contributions to the learning group and class. Presentations demonstrate sufficient knowledge of content as well as implications	The student is on time, prepared for class, and participates in group and class discussions. The student attends all classes and if an absence occurs, the procedure outlined in this section of the syllabus is followed. Presentations demonstrate minimal	The student is late for class. Absences are not documented by following the procedures outlined in this section of the syllabus. The student is not prepared for class and does not actively participate in discussions. Presentations are lacking knowledge of

	content as well as implications for teaching.	for teaching.	knowledge of content and/or implications for teaching.	content and connections to teaching.
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2. Assignment and examination weighting

10%	Introduction/Professional Development Autobiography
40%	Coaching Project
40%	Lesson Study Project
20%	Reading Discussion Questions & Participation

3. Grading policies

The evaluation criteria utilizes the graduate grading scale and is as follows:

A	93%-100%	B+	87%-89%	C	70%-79%
A-	90%-92%	B	80%-86%	F	Below 70%

TASKSTREAM REQUIREMENTS

Every student registered for any Mathematics Education Leadership course with a required performance-based assessment is required to submit this assessment, the Coaching Project and the Lesson Study Project to TaskStream (regardless of whether a course is an elective, a onetime course or part of an undergraduate minor). Evaluation of the performance-based assessment by the course instructor will also be completed in TaskStream. Failure to submit the assessment to TaskStream will result in the course instructor reporting the course grade as Incomplete (IN). Unless the IN grade is changed upon completion of the required TaskStream submission, the IN will convert to an F nine weeks into the following semester.

GMU POLICIES AND RESOURCES FOR STUDENTS

- a. Students must adhere to the guidelines of the George Mason University Honor Code (See <http://oai.gmu.edu/the-mason-honor-code/>).
- b. Students must follow the university policy for Responsible Use of Computing (See <http://universitypolicy.gmu.edu/policies/responsible-use-of-computing/>).

- c. Students are responsible for the content of university communications sent to their George Mason University email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students solely through their Mason email account.
- d. The George Mason University Counseling and Psychological Services (CAPS) staff consists of professional counseling and clinical psychologists, social workers, and counselors who offer a wide range of services (e.g., individual and group counseling, workshops and outreach programs) to enhance students' personal experience and academic performance (See <http://caps.gmu.edu/>).
- e. Students with disabilities who seek accommodations in a course must be registered with the George Mason University Office of Disability Services (ODS) and inform their instructor, in writing, at the beginning of the semester (See <http://ods.gmu.edu/>).
- f. Students must follow the university policy stating that all sound emitting devices shall be turned off during class unless otherwise authorized by the instructor.
- g. The George Mason University Writing Center staff provides a variety of resources and services (e.g., tutoring, workshops, writing guides, handbooks) intended to support students as they work to construct and share knowledge through writing (See <http://writingcenter.gmu.edu/>).

ATTENDANCE POLICY

Students are expected to attend the class periods of the courses for which they are registered. In-class participation is important not only to the individual student, but also to the class as a whole. Because class participation may be a factor in grading, instructors may use absence, tardiness, or early departure as de facto evidence of nonparticipation. Students who miss an exam with an acceptable excuse may be penalized according to the individual instructor's grading policy, as stated in the course syllabus (GMU University Catalog; AP 1.6; See <http://catalog.gmu.edu/content.php?catoid=25&navoid=4845#attendance>)

PROFESSIONAL DISPOSITIONS

Students are expected to exhibit professional behaviors and dispositions at all times.

CORE VALUES COMMITMENT

The College of Education & Human Development is committed to collaboration, ethical leadership, innovation, research-based practice, and social justice. Students are expected to adhere to these principles: <http://cehd.gmu.edu/values/>.

For additional information on the College of Education and Human Development, Graduate School of Education, please visit our website <http://gse.gmu.edu/>.

PROPOSED CLASS SCHEDULE:

Field Guide = Math Coach Field Guide *Coaching* = Content-Focused Coaching

Lesson Study = Lesson Study Step-by-Step

	Date	Book Chapter	Topics and Goals	Class Activity	Math Team Work	Assignments Due
1	Tuesday August 26 th Wednesday August 27 th	Introduction to the class	Principles and skills for being a math coach. What is the job like?	Review questions. Consider ways you were supported or mentored as a teacher. How can that be passed along?	Team introductions	
2	Tuesday September 2 nd Wednesday September 3 rd	<i>(Field Guide)</i> 1: Being a successful math coach 2: The math bulletin board 3: Coaching a middle school math team	<ol style="list-style-type: none"> Interacting with teachers about students' work Dealing with conflict, PLC, Group norms 	Watch pencast videos – what are critical issues for the student? How would you use these with a team? Question activity – write a challenge or frustration you have as a coach/teacher in the form of a question What are challenges and opportunities for PLC work?	Write group norms	
3	Tuesday September 9 th Wednesday September 10 th	<i>(Lesson Study)</i> 1: Why Lesson Study? 2: Lesson Study in Action (Part 1), Clips 1 and 2	1. Basic introduction to lesson study with particular focus on planning and first teaching	Appendix B (clips 1 and 2)	Identify 1-2 goals for your lesson study group. Provide rationale and begin action plan.	Autobiography Due
4	Tuesday September 16 th Wednesday September 17 th	<i>(Lesson Study)</i> 3: Build a Lesson Study Group 4: Focus the Group's Inquiry	Building a PD group to conduct a research lesson, more detail about planning	Appendix J (selecting research theme)	Agree on research theme. Identify a topic. Begin to discuss possible lessons.	
5	Tuesday September 23 rd Wednesday September	<i>(Lesson Study)</i> 5: Conduct and Discuss the Research Lesson 6: What should	Walking through a research lesson. What happens in the classroom?	Appendix B (clips 3, 4 and 5)	Study and aggregate existing resources (e.g., standards,	

	24 th	you expect from Lesson Study?			lessons, articles). Begin to plan lesson.	
6	Tuesday September 30 th Wednesday October 1 st	<i>(Lesson Study)</i> 7: Lesson Study's Diverse Forms 8: Misconceptions, Challenges, Next Steps 9: Next Steps	Challenges and opportunities for lesson study		Create plan for focus lesson and identify who in the group will teach the lesson. Use teaching-learning plan in Appendix L for structure.	
7	Tuesday October 7 th Wednesday October 8 th	<i>(Coaching)</i> 1: What is content-focused coaching? 2: Working with teachers	Introduction to content-focused coaching Individual work with teachers	Coaching play Summarize basic principles		
8	Tuesday October 21 st (No class 10-14 Columbus Day Recess) Wednesday October 15 th	<i>(Coaching)</i> 5: Coaching a new teacher 6: Coaching an experienced teacher 7: Coaching a teacher leader	What are variations for content-focused coaching? What are "types" of teachers you might encounter and how do you respond?	Compare these different scenarios. How are they handled differently by the coach?		
9	Tuesday October 28 th (No class 10-14 Columbus Day Recess) Wednesday October 22 nd	<i>(Coaching)</i> 8: The principal 9: The district 10: Teacher to coach	Coaching in the context of the school and the district – support and obstacles.			
10	Tuesday November 4 th Wednesday October 29 th	<i>(Field Guide)</i> 4: Helping reluctant teachers 5: Making sense of arithmetic 7: Coteaching	Teaching with another teacher Demonstration/modeling	What are factors that make a teacher reluctant to 'get on board'? How can you alleviate these as a math spec? Create a table showing pros/cons, purposes/objectives of co-teaching vs. modeling		
11	Tuesday November	<i>No Reading -</i>	Present Lesson Study Results to Class			Lesson Study Project Due

	11 th Wednesday November 5 th					
12	Tuesday November 18 th Wednesday November 12 th	<i>(Field Guide)</i> 6: Learning to look 9: Helping teachers take ownership	Observation tools Lesson design frameworks	Think about a time when you observed another teacher – what did you learn? What are critical questions for asking teachers to help them focus on their teaching and students' learning?	Plan coaching project. Discuss with your team who you'll be coaching, why and how.	
13	Tuesday November 25 th Wednesday November 19 th	<i>(Field Guide)</i> 10: Adopting a new math program 11: From the trenches	Implementing innovations, school- wide innovation	EMSTL case What are similarities between the process in chapter 10 and the process in the online case?	Review clips in your team. Discuss.	
14	Tuesday December 2 nd Wednesday December 3 rd (No class 11- 26 Thanksgiving Break)				Review clips in your team. Discuss.	
15	Tuesday December 9 th Wednesday December 10 th					Coaching Project Due

RELATED DOCUMENTS AND LINKS BY WEEK

Week	Documents and Links to Post
1	
2	Multiplication: http://www.livescribe.com/cgi-bin/WebObjects/LDApp.woa/wa/MLSOverviewPage?sid=bRWBJdf6RDDM Fractions: http://www.livescribe.com/cgi-bin/WebObjects/LDApp.woa/wa/MLSOverviewPage?sid=LQcqHZxzMVgK
3	
4	
5	Math Spec Case - http://mathspecialists.org/LIM2/player.html Doc to read - http://emstl.pbworks.com/w/file/50359731/Modular_Case_part2_Practices_Learning_Community_Coach.pdf
6	
7	
8	
9	

Coaching Plan Rubric

	Meets Expectations	Developing	Does Not Meet Expectations	Score/Level
Coaching Plan	<p>Includes thorough description of teacher background, goals for working with the teacher and possible challenges.</p> <p>Goals and challenges are focused on mathematics teaching and learning.</p>	<p>Includes limited description of teacher background, goals for working with the teacher and possible challenges.</p> <p>Goals and challenges may not be focused on mathematics teaching and learning or may be superficial in nature.</p>	<p>No background description of the teacher is provided.</p> <p>No goals or very limited goals are presented.</p>	
Lesson Analysis	<p>Description of the lesson content and an in depth analysis of the mathematics and mathematics pedagogy.</p>	<p>Description of the lesson content and an in depth analysis but few specifics or the analysis is minimal and does not focus on the mathematics and mathematics pedagogy.</p>	<p>Description of lesson with no analysis or incomplete analysis</p>	

Post-Conference & Video/Questions Rubric

	Meets Expectations	Developing	Does Not Meet Expectations	Score/Level
Post-Conference Video/Questions	<p>Questions will help the teacher analyze the lesson focusing on teacher and student moves.</p> <p>The post-conference pushes the teacher to reflect on the mathematics and the students' learning.</p> <p>The post-conference addresses at least one or two specifics of the lesson.</p>	<p>Questions that may help teachers look more specifically at the sequence of the lesson.</p> <p>The post-conference does not sufficiently push the teachers to reflect on the mathematics and the students' learning.</p> <p>The post-conference is global and does not bring out the specifics from the lesson.</p>	<p>Questions are not cohesive.</p> <p>The post-conference does not push the teacher to reflect specifically on the mathematics and on the student learning to identify where the lesson can be strengthened.</p>	

Pre-Conference Video Rubric

	Meets Expectations	Developing	Does Not Meet Expectations	Score/Level
Pre-Conference/Questions/Video	<p>Questions help the teacher frame the lesson, planning the mathematics and the instructional strategies so that students have a deep understanding of the mathematics.</p> <p>The mathematics content of the lesson is thoroughly addressed in the pre-conference</p> <p>The teacher and coach have clearly articulated the mathematics goal of the lesson, how the task or activity will contribute to children developing an understanding of the mathematics, the sequential flow of the lesson, and outcomes expected from the lesson.</p>	<p>Questions may help the teacher frame the lesson, planning the mathematics and the instructional strategies so that students have a partial understanding of the mathematics.</p> <p>The written set of questions is somewhat sketchy and/or incomplete.</p> <p>The coach is doing most of the talking.</p> <p>Coach's questions are not open ended and do not push the teacher to deeper levels of understanding.</p>	<p>Questions are not cohesive.</p> <p>No evidence presented in the video that the coaching pushed the teacher's thinking.</p> <p>The pre-conference does not clearly and specifically address the mathematics.</p> <p>The lesson is not coherent and the goals and outcomes have not been identified.</p>	

Lesson Study Group Project Report Rubric

	Exceeds Expectations	Meets Expectations	Needs Revision	Unacceptable	Score/Level
Artifact Analysis – Analyze and evaluate student ideas and work and design appropriate responses. (p. 6-7, AMTE, 2011)	Student ideas are analyzed in detail and connected to possible responses. Multiple rationales are given where appropriate with reasonable suggestions for instruction and teaching.	Artifacts and student learning is analyzed with depth and detail. The responses suggested are appropriate.	The analysis is superficial and limited in scope. Few suggestions or inappropriate suggestions for responses to students' work are provided.	No analysis of student work is included. No responses to students' work are given.	
Revisions	Revisions to the lesson plan are detailed and reasonable given the thorough outcomes. The revisions include modifications appropriate for diverse student populations. Multiple revisions are provided in order to give a teacher options depending on context and circumstances.	Revisions to the lesson plan are appropriate and reasonable given the implementation outcomes. The revisions include modifications appropriate for diverse student populations.	Revisions are superficial or limited in scope. Few revisions are given or may be not be connected to the analysis of the lesson plan implementation.	No revisions are given to the lesson plan.	
Further Questions/Implications	Implications and further questions provided additional considerations for teaching the lesson. Questions are specific to the lesson at hand and examine not only the specific lesson but how the lesson is embedded in a trajectory of instruction. Questions and implications are guided by research, resources and linked to additional sources.	Implications and further questions provided additional considerations for teaching the lesson. Questions are specific to the lesson at hand and examine not only the specific lesson but how the lesson is embedded in a trajectory of instruction.	Implications and further questions may be superficial or limited in scope. Few questions or implications may be given and they may be disconnected from the lesson or the larger learning trajectory.	No implications or further questions are given.	

Lesson Study Individual Report Rubric

	Exceeds Expectations	Meets Expectations	Needs Revision	Unacceptable	Score/Level
a. What was your role in the lesson study?	Role explained in detail with reference to specific, goal-related activities.	Role described in sufficient detail. Aspects of the goal mentioned.	Limited description of role given that is difficult to understand. No references to the goal of the lesson study given.	Section missing or incomplete.	
b. What aspects of the research lesson did you attempt? What were the results of this work?	Evidence described in detail with reference to specific artifacts. Notes specific points of impact on the lesson or revisions to the lesson.	Evidence collected is listed and results are listed.	No evidence is cited. Limited links to the implementation are given.	Section missing or incomplete.	
c. What did you learn about yourself as a current/future math specialist through this project?	Cites specific examples from the collaborative lesson study experience. References implications for present and future work as a math specialist.	Some implications of the lesson study on future role as a math specialist are given.	Limited implications and reflections on experience are given or may be superficial.	Section missing or incomplete.	

Lesson Study Resource Collection Rubric

	Exceeds Expectations	Meets Expectations	Needs Revision	Unacceptable	Score/Level
Use professional resources such as professional organization networks, journals, and discussion groups to be informed about critical issues related to mathematics teaching and learning, e.g., policy initiatives and curriculum trends. (AMTE Standards, 2011, p. 6-7)	A variety of resources (15-20) are provided and categorized. Summary information describing the resources is given. Sources are drawn from professional and reliable sources.	Many resources are provided to support the lesson (5-10). Resources are connected to mathematics of the lesson and are drawn from professional and reliable sources.	Limited resources are provided and may be from largely unprofessional sources.	No resource list is included.	

Lesson Study Lesson Plan Rubric

	Exceeds Expectations	Meets Expectations	Needs Revision	Unacceptable	Score/Level
Instructional Formats Develop skillful and flexible use of different instructional formats – whole group, small group, partner, and individual – in support of learning goals.	Plan includes more than two formats and indicates options for the teacher to make adjustments or changes as necessary.	Plan includes at least 2 formats and includes clear movement between and among formats.	Plan includes only one instructional format.	Instructional format not indicated or unclear.	
Mathematical Tasks Design, select, and/or adapt worthwhile mathematics tasks and sequence examples to support a particular learning goal.	Math tasks are well-aligned to learning goals and sequenced appropriately. Tasks also include appropriate options and possible adjustments for the teacher as necessary.	Math tasks support multiple learning goals and are aligned in a clear trajectory. Tasks address complex mathematical thinking and learning.	ArtifMath tasks may not be well-aligned with the learning goals for the lesson. Tasks may be superficial or inappropriate for the class context.acts and student learning is analyzed with depth and detail. The responses suggested are appropriate.	Goals are unclear or not indicated.	
Multiple Representations Construct and evaluate multiple representations of mathematical ideas or processes, establish correspondences between representations, and understand the purposes of doing so.	Lesson requires students to use multiple representations, make connections between representations. Also includes understanding the rationale for representations.	Lesson requires students to use multiple representations, make connections between representations.	Lesson requires limited use of representations. Connections between representations and processes may not be evident.	Only one representation is included. No connections are made between ideas and processes.	
Questions Use questions to effectively probe mathematical understanding and make productive use of responses.	Questions effectively probe math understanding and make productive use of responses. Also includes additional questions that extend student understanding. Helps teacher understand student thinking.	Questions effectively probe math understanding and make productive use of responses.	Limited questioning is indicated. Questions may be superficial (e.g., only yes/no) or do not require explanation from students.	Very little or no questioning is indicated in lesson.	
Mathematical Communication Develop learners'	Learners' public math communication is supported and encouraged. Multiple	Learners are asked to communicate mathematically with the whole class. Lesson	Limited opportunities for public math discourse are given or are presented	No opportunities for public mathematical communication are	

	Exceeds Expectations	Meets Expectations	Needs Revision	Unacceptable	Score/Level
abilities to give clear and coherent public mathematical communications in a classroom setting.	opportunities are presented throughout the lesson. Options are given for the teacher use to make adjustments as necessary.	includes strategies for the teacher to organize and create such opportunities.	superficially.	given.	
Diversity Manage diversities of the classroom and school –cultural, disability, linguistic, gender socio-economic, developmental – and use appropriate strategies to support the mathematical learning of all students.	Strategies for 2-3 groups of diverse learners are provided. Options are provided for the teacher to make adjustments for diverse learners.	Strategies for 1-2 groups of diverse learners are included to support math learning. Adjustments are clearly linked to learning and appropriate for the group.	Limited, unclear or inappropriate strategies are provided for diverse learners.	No strategies for diverse learners are provided.	