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

EDCI 645 DL2: Curriculum Development in Mathematics Education
3 Credits, Fall 2015

PROFESSOR:

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I will do my best to respond to e-mail within 24 hours.

COURSE DESCRIPTION:

A. Prerequisites/Corequisites
Admission to the Mathematics Education Leadership Master's Degree Program or instructor permission.

B. University Catalog Course Description
Analysis, design, and evaluation of school mathematics curricula. Yearlong seminar for master's-level students in mathematics education leadership cohort program

C. Expanded Course Description
EDCI 645 is designed to enable mathematics education leaders to evaluate mathematics curriculum materials appropriate for school mathematics. See also Learner Outcomes and Professional Standards.

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 31, 2015.

TECHNICAL REQUIREMENTS:

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

- 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
- 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.
- 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/download-windows-media-player
    - Apple QuickTime Player: http://www.apple.com/quicktime/download/
- A headset microphone for use with the Blackboard Collaborate web conferencing tool

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:

1. Identify standards-based school mathematics curriculum (K-8); Analyze key characteristics of outstanding curriculum materials for school mathematics
2. Examine learning theories that have been influential in mathematics education and identify ways those theories have been translated into curriculum materials and strategies for teaching.
3. Evaluate commercially developed school mathematics curriculum materials to make informed choices.
4. Present and discuss a set of school mathematics curriculum materials in depth.
5. Design a small curriculum project based on key design principles.

PROFESSIONAL STANDARDS (National Council of Teachers of Mathematics (NCTM)):

The course follows the NCTM NCATE *Standards for Elementary Mathematics Specialists (2012).* In your role as a teacher, lead teacher, and/or coach/mentor, elementary mathematics specialist candidates:

3a) Apply knowledge of curriculum standards for elementary mathematics and their relationship to student learning within and across mathematical domains in teaching elementary students and coaching/mentoring elementary classroom teachers.

4b) Plan, create, and coach/mentor teachers in creating developmentally appropriate, sequential, and challenging learning opportunities grounded in mathematics education research in which students are actively engaged in building new knowledge from prior knowledge and experiences.

4c) Incorporate knowledge of individual differences and the cultural and language diversity that exists within classrooms and include and assist teachers in embracing culturally relevant perspectives as a means to motivate and engage students.

4d) Demonstrate and encourage equitable and ethical treatment of and high expectations for all students.

4e) Apply mathematical content and pedagogical knowledge in the selection, use, and promotion of instructional tools such as manipulatives and physical models, drawings, virtual environments,

presentation tools, and mathematics-specific technologies (e.g., graphing tools and interactive geometry software); and make and nurture sound decisions about when such tools enhance teaching and learning, recognizing both the insights to be gained and possible limitations of such tools.

6d) Demonstrate mathematics-focused instructional leadership through actions such as coaching/mentoring; building and navigating relationships with teachers, administrators, and the community; establishing and maintaining learning communities; analyzing and evaluating educational structures and policies that affect students' equitable access to high quality mathematics instruction; leading efforts to assure that all students have opportunities to learn important mathematics; *evaluating the alignment of mathematics curriculum standards, textbooks, and required assessments and making recommendations for addressing learning and achievement gaps;* developing appropriate classroom or school-level learning environments; and *collaborating with school-based professionals to develop evidence-based interventions for high and low-achieving students.*

REQUIRED TEXTS:

Tomlinson, C. A., Imbeau, M. B. (2010). *Leading and managing a differentiated classroom.* Alexandria, VA: ASCD.

Stein, M. K., Smith, M. S., Henningsen, M. A., & Silver, E. A. (2009*). Implementing standards-based mathematics instruction: A casebook for professional development* (2nd ed.). New York and Reston, VA: Teachers College Press and National Council for Teachers of Mathematics.

Virginia Standards of Learning

Common Core State Standards for Mathematics

REQUIRED READINGS: Additional readings will be posted on the course Blackboard site. You will need your GMU email login and password to access.

COURSE ASSIGNMENTS AND EXAMINATIONS:

1. **PARTICIPATION (10%)**
    a. A commitment to participation in class discussions and 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, leading discussions about selected mathematics problems, and sharing with the class the products of various writing,

reflection, lesson planning, and field experience assignments. The expectations, demands and workload of this course are professional and high.

b. A commitment to reading reflectively and critically the assigned readings. The readings will theme to the course content. They have been selected to introduce themes in curricular development as well as research and critical commentary on mathematics curriculum. *For each reading select 3 statements that resonate with you about your beliefs or expectations. Be ready to share in class.*

2. **PHOTO NARRATIVE PROJECT (10%)**
   a. The goal of the project is to take a series of photos (4) that tell the story of mathematics teaching and learning in your school and/or community. Two pictures should illustrate factors that help the teaching and learning of mathematics; two pictures should illustrate factors that hinder the teaching and learning of mathematics. Your assignment should include: your goals and objectives of teaching mathematics, connections between the photos, and the topics covered by the readings thus far.

   b. There are two options for the format of this assignment they are as follows: 1) Write a ½ to 1 page paper; or 2) Use a technology resource (Popplet, Presi, Glogster, etc).

3. MATHEMATICS SPECIALIST WIKI COLLECTION (25%)
(NCTM NCATE 3a, 4b, 4c, 4d, 4e)
   a. Begin a collection of resources addressing the following items. Be sure to state the goals/objectives of the ideal curriculum you are basing your items on for this assignment. All are to be submitted to the pbworks site (to be shown later) so other class members may view your resources. The final collection will also be uploaded to Blackboard.
      i. **Math Teaching Tips:** Explain a teaching strategy related to mathematics that you may need to model as a math specialist (i.e., not a general classroom management strategy or solution). This could be related to the process standards or mathematical practices and is to be grounded in research. (*NCTM NCATE 3a, 4b)*
      ii. **Great Articles and Books:** Write a review/description of one of your favorite articles or books about math teaching. Explain how you might use the ideas in the article in the development of curriculum and to demonstrate and encourage equitable and ethical treatment of and high expectations for all students. (*NCTM NCATE 3a, 4d)*
      iii. **Technology Implementation:** Describe a technology tool and create a handout you could give to teachers about the tool. This could include virtual manipulatives, calculators, SmartBoard tools or computer/mobile devices that can support students' mathematics

learning. Reflect on how the tool will enable students to meet the goals/objectives of a curriculum **grounded in research** that will actively engage students in building knowledge while maintaining equitable and ethical treatment/experiences. Insights to be gained and possible limitations of using the tool are included in the reflection. (*NCTM NCATE 3a, 4b, 4d, 4e)*

iv. **Diverse Learners:** Describe a strategy you use for differentiation with diverse learners (e.g., ELL, special education, remediation, gifted, cultural aspects, etc). How do you incorporate it into teaching? How can it be adjusted across grade levels? How does it enable the students to meet the goals/objectives of the curriculum? The strategy is to be grounded in research, take into consideration individual differences and cultural and language diversity, and promotes equitable and ethical treatment of and high expectations for all students. (*NCTM NCATE 3a, 4b. 4c, 4d)*

4. CURRICULUM ANALYSIS PROJECT (30%)

(NCTM NCATE 6d)

Ideal, Implemented, and Analysis of Role as Math Coach to be submitted on Blackboard. Part of your work as a mathematics specialist will be to understand the materials the teachers in your classrooms are currently using. This assignment will include three phases. See rubric.

a. **Phase I: Ideal Curriculum (Materials Currently Used)** This portion of the assignment asks you to determine what materials are currently in use at one school for one of two grade bands (either K-5 or 3-8). Working as mathematics specialists requires you to understand not only the mathematics of the grade levels at your school but also the development of mathematics vertically. In addition to the textbooks, collect materials such as pacing guides, standards documents, additional frameworks, and any other materials that should be aligned with the textbooks and support teachers' implementation of the content. To examine the alignment, select two different mathematics topics and look across the documents to understand how the topics are addressed. Write a summary of your findings including the following sections.

i. Basic description of the textbook(s) (publisher, publication date, grade levels). Description of the overarching philosophy or theory behind the textbooks in terms of teaching and learning (i.e., what is the foundational approach the books are taking?).

ii. Basic description of all the other supporting materials (publisher, publication date, grade levels). Description of the overarching philosophy or theory behind the materials in terms of teaching and learning (i.e., what is the foundational approach the items are taking?). If there are more than 5 supporting resources, select the top 5 to discuss and analyze (not including the textbook). If the resources are the same for the entire grade band, than report on the grade band

items. If different resources are available for each grade level, then only report on your chosen grade-level resources.

iii. For each topic you selected, are the materials well aligned to the standards or not? Select a resource to make the following analysis for the two topics.
    1. Does the location of the topic in the materials make sense (e.g., are the prerequisites appropriate? Is there a n connection to the preceding and following topics)? Does this sequence of the topic correspond to a research-backed learning trajectory?
    2. Are additional topics (or aspects of your topic) beyond the standards covered by the materials?
    3. Are there any components of the topic that are missing from the materials? Are the materials e follow for students? Do the activities make sense? For the 2 selected topics, look to determine if the chosen resource is sufficient to build knowledge for your grade and to prepare students for the future. If the same resource is available for each grade in your grade band, then use those to determine the adequacy of the vertical alignment. If different resources are available at each grade-level, then select the ones that are used in similar ways to determine the vertical alignment.
    4. What are advantages and disadvantages of the materials for the teacher?

b. **Phase II: Implemented Curriculum (Teacher Interview)** For this portion of the study, you will interview two teachers (who should remain anonymous) about how they use the materials for planning and instruction. The teachers should be from the grade levels you reviewed in phase I. The interviews should be 30-45 minutes. You should gather their impressions of the materials. Questions could include the following:
    i. Do they like the textbooks and supporting materials they use? Why or why not?
    ii. Do they like the other materials they use? Why or why not?
    iii. How do they intermingle all materials available to use in the classroom? Approximately what percentage of their instruction is based on the curricular materials?
    iv. What would they do to improve the materials?
    v. If, when, and how do they supplement the available materials with other math activities?
    vi. If the teacher is using more than one textbook series, how are they used together?

Summarize the teachers' comments in less than 5 pages. This summary is not meant to be a transcript of their words (though you may include select comments or quotes) but rather a description of their responses.

c. **Phase III: Ideal and Implemented Curriculum (Combined Analysis)**
Using your results from phases I and II, respond to the following questions.
   i. How is the ideal curricula implemented by the teachers?
   ii. Does the implemented curricula meet the expectations of the ideal curriculum?
   iii. Thinking as a mathematics specialist or coach, for the teachers you interviewed, how would you proceed in working with them based on their responses? What suggestions would you have for them to help their teaching? What resources might they need to support their teaching?

5. **CLASS CONSTRUCTED CURRICULUM TASKS (25%)**
(*NCTM NCATE 3a, 4b, 4c, 4d, 4e, 6d)*
A common challenge math specialists face is finding good problems and tasks for teachers to use with their students. As a whole class project, we are going to construct a curriculum (in this case, a collection of tasks) addressing a blend of four content strands (number, algebra, geometry, data analysis) and different mathematical practices (reasoning, problem solving, proof, representations).

Each collection should include tasks for the assigned grade band (K-5) or (3-8) and should include descriptions of how each task could be used with multiple grade levels within the grade band. The **Wiki** for creating the curriculum will be shared by both sections of the course so you'll have access to even more resources. Materials will be peer reviewed by your classmates and then revised.

We will brainstorm topics, practices, special groups during the first class and then get into groups assigned to a specific set. *Each person within the group will be responsible for two tasks and expected to try one of their own tasks in a classroom.* See Rubric.

Tasks submitted to the Wiki should include the following:
   a. Grade level
   b. Major concept: What is the task about? What is the mathematical objective?
   c. Technology (if it will enhance learning)
   d. Objectives/goals for the task: VA SOL, NCTM Process, CCSSMP
   e. Prerequisite knowledge/VA SOLs related to prior knowledge
   f. Teacher notes
      i. Are extensive and sufficient for teachers to follow and apply with students. This should include anticipated student responses and questions to prompt classroom discourse.
      ii. Explains how the task addresses differentiation/diversity
      iii. Provides modifications for other grade levels in your grade band
   g. Student handout

Turned in on Blackboard will be both tasks AND a reflection about the teaching experience of one of the tasks. The reflection should address the following:

a. What went well with the task (justified)
b. What did not go well with the task (justified)
c. Strategies intended for student to use
d. Strategies the students used in addition to what was anticipated
e. Two student work samples – annotations addressing their work and how it related to the task expectations.

During our final class meeting, each group will **present** an overview of their collection of tasks, goals/objectives/overview of a task(s), and how it may be modified for usage in vertical alignment.

ASSIGNMENT	PERCENT	SUBMISSION
Participation	10%	
Photo-Narrative Project	10%	Blackboard: File Exchange & Assignments
Mathematics Specialist Wiki Collection	25%	PB Works & Blackboard Assignments
Curriculum Analysis Project	30%	Blackboard Assignments
Class Constructed Curriculum Tasks	25%	Blackboard & Wiki

GRADING POLICY (Graduate Grading Scale)

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

BLACKBOARD REQUIREMENTS

Every student registered for any Mathematics Education Leadership course with a required performance-based assessment is required to submit this assessment, Mathematics Specialist Wiki Collection, Curriculum Analysis Project and Class Constructed Curriculum Tasks to Blackboard (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 Blackboard. Failure to submit the assessment to Blackboard will result in the course instructor reporting the course grade as Incomplete (IN). Unless the IN grade is changed upon completion of the required Blackboard submission, the IN will convert to an F nine weeks into the following semester.

OTHER EXPECTATIONS:

The assignments are intended to develop skills in mathematics curriculum analysis and evaluation, and the ideal and implemented curriculum. Students conduct in-depth study of mathematics curriculum materials, relate materials to goals and objectives of the ideal curriculum, and present an evaluation of their findings. Discussions will be focused on the nature and development of curriculum in schools. All assignments are to be completed on time so that class members might benefit from the expertise and contributions of their colleagues.

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/**).

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:

(NOTE: The schedule is subject to change. Modifications will be announced in class, by email and posted on the class Blackboard site.)

Date	Topic	Readings	Assignment Due
Week 1 8/31 **Format** Synchronous	Collaborate Orientation Syllabus Overview Introduction to Curriculum and Standards Class Constructed Tasks: Group Formation		Profile picture and information posted in Collaborate.
Week 2 9/7 **Labor Day**	**No Class Meeting**		
Week 3 9/14 **Format** Synchronous	Philosophical Foundations of Curriculum Behaviorism vs. Constructivism	**Articles** Erlwanger (1973) Schoenfeld (2002)	**Photo Narrative Project Due**
Week 4 9/21 **Format** Synchronous	Content and Practice Standards Learning Trajectories and Progressions	**Standards** CCSSM Standards for Mathematical Practice NCTM Process Standards **Articles** Remora (2009) Charles (2008) **Choice of One** Clements Video http://www.curriculum.org/k-12/en/videos/doug-clements-learning-trajectories Sarama & Clements (2009)	Be Prepared to Discuss Phase 1 of Curriculum Analysis Project and Rubric
Week 5 9/28 **Format** Synchronous	The State of Textbooks	**Articles** Baker et al (2010) p. 396-417 Taylor (2013)	MS Wiki: Math Teaching Tip OR Technology Implementation
Week 6 10/5	High-Level Tasks	**Stein, Smith, Henningsen & Silver, 2009** (Purple Book) Introduction	First Class Constructed

Format Synchronous	Maintaining Cognitive Demand	Chapters 1 & 2 **Articles** Stein & Smith (1998)	Curriculum Task Posted: Wiki
Week 7 10/13 **Tuesday Meeting** **(Columbus Day)** **Format** Synchronous	Teacher Philosophy and Vision	**Tomlinson & Imbeau** Chapters Intro, Chapter 1 **Articles** Eisenmann & Even (2009) Brown et. al (2009)	MS Wiki: Math Teaching Tip OR Technology Implementation
Week 8 10/19 **Format** Synchronous	PCK and Teacher Learning	**Articles** Hill & Ball (2009) Remillard (2000) Grant et. al (2009)	Be prepared to discuss Phase II of Curriculum Analysis Project
Week 9 10/26 **Format** DB	Equity & Access	**Articles** Gutstein (2003) Jacobs (2010) **Videos** Uri Treisman NCTM Equity Address (2013) (52 minutes) https://vimeo.com/65731353 Robert Moses NPR Radio Story (2013) (8 minutes) http://www.npr.org/sections/codeswitch/2013/08/02/206813091/to-60s-civil-rights-hero-math-is-kids-formula-for-success	MS Wiki: Great Articles & Books
Week 10 11/2 **Format** Synchronous	Curricular Vision and Beliefs	**Tomlinson & Imbeau** Chapters 2, 3 Drake & Sherin (2009)	
Week 10 11/9 **Format** Synchronous	Implementation	**Tomlinson & Imbeau** Chapters 4, 5 **Stein, Smith, Henningsen & Silver, 2009** (Purple Book) Chapter 6	Second Class Constructed Curriculum Task Posted: Wiki
Week 11 11/16 **Format** Synchronous	Differentiation Sticking Points A Teacher's Purpose	**Tomlinson & Imbeau** Chapter 6, 7 **Articles** Schoenfeld (2009)	Be prepared to discuss Curriculum Analysis Project
Week 12 11/23 **Format** DB	Coaching, Equity & Access	**Stein, Smith, Henningsen & Silver, 2009** (Purple Book) Pick one: Chapter 7 or Chapter 9 Chapter 11 **Articles** Sailors & Shanklin (2010)	MS Wiki: Diverse Learners **MS Wiki: Upload to Blackboard**

Week 13 11/30 **Format** Synchronous	Issues with Access/Impact on Coaching Textbook Evaluation/ Evaluating Curriculum	**Articles** Flores (2007) Clements (2007)	**Class Constructed Curriculum Task & Reflection: Blackboard**
Week 14 12/7 **Format** Synchronous	Class Constructed Curriculum Tasks Group Presentations	Franke et. al (2001)	**Curriculum Analysis Project: Blackboard**

ASSESSMENT RUBRIC(S):

Mathematics Specialist Wiki Collection Rubric

(*NCTM NCATE 3a, 4b, 4c, 4d, 4e*)

	Does Not Meet Expectations 0	**Below Expectations 1**	**Meets Expectations 2**	**Exceeds Expectations 3**
Math Teaching Tip: A teaching strategy is explained. Relationship to the Process Standards or Mathematical Practices/Standards is explained. *NCTM NCATE 3a*	Strategy is not explained or related to the Process Standards and/or Mathematical Practices/Standards.	Strategy is explained but lacking how to apply the tip in a classroom setting. Relationship to the Process Standards and/or Mathematical Practices/Standards is not elaborated upon.	Strategy is explained but leaves gaps in how to apply the tip in a classroom setting. Relationship to the Process Standards and /or Mathematical Practices/Standards is not fully developed.	Strategy is clearly explained so that one might follow and apply the tip. Relationship is made to Process Standards and/or Mathematical Practices/Standards.
Math Teaching Tip: Tip may be used to coach/mentor teachers and is grounded in research. *NCTM NCATE 4b*	The tip is not grounded in research.	The research supporting the tip is weak. The usefulness of the tip to teachers working with students is questionable.	The tip is grounded in research. The usefulness of the tip to teachers working with students is questionable.	The tip is grounded in research. The tip will be useful to teachers when working with students.
Great Articles & Books: A written review of the item connects the teaching of mathematics to the development of curriculum thereby applying knowledge of curriculum standards and their relationship to student learning. *NCTM NCATE 3a*	The review *does not* include: • A connection between the article and the goals/objectives of the curriculum, • A connection between the article, student learning, and the standards.	The review includes: • A very weak connection between the article and the goals/objectives of the curriculum, • A very weak connection between the article, student learning, and the standards.	The review includes: • A connection between the article and the goals/objectives of the curriculum but lacks thorough elaboration, • A connection between the article, student learning, and the standards but is not fully elaborated upon.	The review includes: • A strong connection between the article and the goals/objectives of the curriculum, • A strong connection between the article, student learning, and the standards.
Great Articles & Books: The review explains how the article promotes	The review *does not* include: • A thorough explanation	The review includes: • A weak explanation of how the article promotes	The review includes: • An explanation of how the article promotes	The review includes: • A thorough explanation of how the article

equitable and ethical treatment of and high expectations for all students. *NCTM NCATE 4d*	of how the article promotes equitable and ethical treatment of and high expectations for all students. • An explanation of how it may be applied to a group of students.	equitable and ethical treatment of and high expectations for all students. • Lacks how it may be applied to a group of students.	equitable and ethical treatment of and high expectations for all students, • Lacks how it may be applied to a group of students.	promotes equitable and ethical treatment of and high expectations for all students. • An explanation of how it may be applied to a group of students.
<u>Technology Implementation:</u> A technology tool is described and a handout created for use with teachers about the tool. Reflection on how the tool will enable students to meet the goals/objectives of the curriculum, grounded in research to actively engage students in building new knowledge from prior knowledge and experiences. *NCTM NCATE 3a, 4b*	Three or more of the following is not included in the submission: • Description of the tool, • Handout for teacher usage, • Reflection on how the tool will promote goals/obj of the curriculum, • Research backing is given, and • Explains how the tool will engage students in building knowledge.	Two of the following is not included in the submission or items are not explained: • Description of the tool, • Handout for teacher usage, • Reflection on how the tool will promote goals/obj of the curriculum, • Research backing is given, and • Explains how the tool will engage students in building knowledge.	One of the following is not included in the submission or items are not fully elaborated upon: • Description of the tool, • Handout for teacher usage, • Reflection on how the tool will promote goals/obj of the curriculum, • Research backing is given, and • Explains how the tool will engage students in building knowledge.	Included in the submission: • Description of the tool, • Handout for teacher usage, • Reflection on how the tool will promote goals/obj of the curriculum, • Research backing is given, and • Explains how the tool will engage students in building knowledge.
<u>Technology Implementation:</u> The reflection will elaborate on how the tool will demonstrate and encourage equitable and ethical treatment of and high expectations for all students. The decision to use the tool will enhance teaching/learning,	The reflection *does not* include: • An explanation of how the tool encourages ethical and equitable treatment of and high expectations for all students, • An explanation of how the tool will enhance instruction – insights to be gained and limitations	The reflection will include: • A weak explanation of how the tool encourages ethical and equitable treatment of and high expectations for all students, • A weak explanation of how the tool will enhance instruction – insights to be gained and	The reflection will include both items of which one explanation is weak: • An explanation of how the tool encourages ethical and equitable treatment of and high expectations for all students, • An explanation of how the tool will enhance instruction – insights to	The reflection will include: • A thorough explanation of how the tool encourages ethical and equitable treatment of and high expectations for all students, • A thorough explanation of how the tool will enhance instruction – insights to be gained and

recognizing both the insights to be gained and possible limitations of such tools. *NCTM NCATE 4d, 4e*	of the tool.	limitations of the tool.	be gained and limitations of the tool.	limitations of the tool.
<u>Diverse Learners:</u> A strategy is described for use with differentiation and with diverse learners. How do you incorporate it into teaching? How can it be adjusted across grade levels? How does it enable the students to meet the goals/objectives of the curriculum? The strategy is to be grounded in research. *NCTM NCATE 3a, 4b*	The Diverse Learner strategy *does not* include: • A detailed description so that a teacher might be able to implement it in the classroom, • Adjustments across grade levels is described, • The relationship to the goals/obj. of the curriculum is given, • Research foundation is given.	The Diverse Learner strategy includes only two of the following and/or the items are *very* weak: • A detailed description so that a teacher might be able to implement it in the classroom, • Adjustments across grade levels is described, • The relationship to the goals/obj. of the curriculum is given, • Research foundation is given.	The Diverse Learner strategy includes all but one of the following or are not thoroughly explained: • A detailed description so that a teacher might be able to implement it in the classroom, • Adjustments across grade levels is described, • The relationship to the goals/obj. of the curriculum is given, • Research foundation is given.	The Diverse Learner strategy includes: • A detailed description so that a teacher might be able to implement it in the classroom, • Adjustments across grade levels is thoroughly described, • The relationship to the goals/obj. of the curriculum is given, • Research foundation is given.
<u>Diverse Learners:</u> The explanation of the strategy should include: Knowledge of individual differences and the cultural and language diversity that exists within classrooms; How the strategy will assist teachers in embracing culturally relevant perspectives as a means to motivate and engage students. How the strategy will demonstrate and	The strategy reflection *does not* include an explanation of how the strategy: • Addresses individual differences, cultural diversity, and/or language diversity, • Assists teachers to embrace diversity and motivate/engage students, • Encourages equitable and ethical treatment of and high expectations for all students.	The strategy reflection includes weak explanations or missing items of how the strategy: • Addresses individual differences, cultural diversity, and/or language diversity, • Assists teachers to embrace diversity and motivate/engage students, • Encourages equitable and ethical treatment of and high expectations for all students.	The strategy reflection includes weak explanation(s) of how the strategy: • Addresses individual differences, cultural diversity, and/or language diversity, • Assists teachers to embrace diversity and motivate/engage students, • Encourages equitable and ethical treatment of and high expectations for all students.	The strategy reflection includes a thorough explanation of how the strategy: • Addresses individual differences, cultural diversity, and/or language diversity, • Assists teachers to embrace diversity and motivate/engage students, • Encourages equitable and ethical treatment of and high expectations for all students.

encourage equitable and ethical treatment of and high expectations for all students. *NCTM NCATE 4c, 4d*				

CURRICULUM ANALYSIS PROJECT RUBRIC

(*NCTM NCATE 6d)*

	Does Not Meet Expectations 0	**Below Expectations 1**	**Meets Expectations 2**	**Exceeds Expectations 3**
Phase 1 Ideal Curriculum: The following is provided for Textbook(s) and Supporting Materials AND All Other Materials: • Title of text • Publisher, • Publication date, • Grade levels • Overarching philosophy or theory in terms of teaching and learning	Textbook(s) and its supporting materials, as well as all other materials, are NOT fully described. The philosophy or theory in terms of teaching and learning is missing.	Textbook(s) and its supporting materials, as well as all other materials, are described but missing some of the required elements. The philosophy or theory in terms of teaching and learning are described but lacking clarity.	Textbook(s) and its supporting materials, as well as all other materials, are described. The philosophy or theory in terms of teaching and learning are described but lacking clarity.	Textbook(s) and its supporting materials, as well as all other materials (≤ 5), are described. The philosophy or theory in terms of teaching and learning are described fully.
Phase 1 Ideal Curriculum: Alignment & Sequence of Topics Reflection describes if • Materials are or are not aligned with standards, • Location of the **2 topics** in the materials make sense with the appropriate prerequisites and a natural connection to the preceding and following topics, and • Materials are easy to understand and follow for students and the activities make sense.	The reflection *does NOT* include a description of: • Whether the materials aligned with the standards, • The location of 2 topics and if they made logical sense with regard to the prerequisites and connections to preceding topics, • Whether the materials were easy to follow and understand for students, and • If the activities connected to the topics	The reflection includes a description of the following but is based on *one topic*: • Whether the materials aligned with the standards, • The location of 1 topic and if it made logical sense with regard to the prerequisites and connections to preceding topics, • Whether the materials were easy to follow and understand for students, and	The reflection includes a description of the following which lacks clarity and completeness: • Whether the materials aligned with the standards, • The location of 2 topics and if they made logical sense with regard to the prerequisites and connections to preceding topics, • Whether the materials were easy to follow and understand for students, and	The reflection includes a comprehensive description of: • Whether the materials aligned with the standards, • The location of 2 topics and if they made logical sense with regard to the prerequisites and connections to preceding topics, • Whether the materials were easy to follow and understand for students, and • If the activities

NCTM NCATE 6d	made sense.	• If the activities connected to the topic made sense.	• If the activities connected to the topics made sense.	connected to the topics made sense.
Phase 1 Ideal Curriculum: Alignment & Sequence of Topics Reflection describes if • Additional topics are beyond the standards covered by the materials, and • There any components of the topic that are missing from the materials. The reflection relates the advantages and disadvantages of the materials for the teacher. *NCTM NCATE 6d*	The reflection of the ideal curriculum *does NOT* discuss: • Additional topics that go beyond the standards that are covered within the materials, and • If there are any components of the topic that are missing from the materials. The reflection *does not* describe the advantages and disadvantages of the materials for the teacher.	The reflection of the ideal curriculum discusses: • Additional topics that go beyond the standards that are covered within the materials, *OR* • If there are any components of the topic that are missing from the materials. The reflection lacks a discussion of the advantages and disadvantages of the materials for the teacher.	The reflection of the ideal curriculum discusses: • Additional topics that go beyond the standards that are covered within the materials, *OR* • If there are any components of the topic that are missing from the materials. The reflection describes the advantages and disadvantages of the materials for the teacher while lacking clarity or thoroughness.	The reflection of the ideal curriculum discusses: • Additional topics that go beyond the standards that are covered within the materials, and • If there are any components of the topic that are missing from the materials. The reflection fully describes the advantages and disadvantages of the materials for the teacher.
Phase 2 Implemented Curriculum: A synopsis of two teacher interviews includes but is not limited to a discussion about whether they liked the textbooks and supporting materials as well as all other materials listed (with their reasoning). *NCTM NCATE 6d*	The synopsis of the two teacher interviews *does NOT* relate whether they liked the resources.	The synopsis of one teacher interview relates whether he/she liked the resources and why. The discussion includes materials given in Phase 1.	The synopsis of the two teacher interviews relates whether they liked the resources and why. The discussion *does not* include all materials given in Phase 1.	The synopsis of the two teacher interviews relates whether they liked the resources and why. The discussion includes all materials given in Phase 1.
Phase 2 Implemented Curriculum: A synopsis of two teacher interviews includes but is	The synopsis of the two teacher interviews regarding how all resources are implemented	The synopsis of one teacher interview relates in how all resources are implemented	The synopsis of the two teacher interviews relates how all resources are implemented	The synopsis of the two teacher interviews relates in detail how all resources are implemented

not limited to a discussion about how they intermingle all materials available to use in the classroom and, if more than one textbook series is used, to explain how are they used together. *NCTM NCATE 6d*	is missing.	(intermingled) but may lack clarity. If more than one textbook series is used, the discussion explains how they are blended together but may lack clarity.	(intermingled) but lacks clarity. If more than one textbook series is used, the discussion explains how they are blended together but lacks clarity.	(intermingled). If more than one textbook series is used, the discussion explains how they are blended together.
Phase 2 Implemented Curriculum: A synopsis of two teacher interviews includes but is not limited to a discussion about what they would do to improve the materials and when and how they supplement the available materials with other math activities. *NCTM NCATE 6d*	The synopsis of the two teacher interviews *does NOT* include: • How the resources may be improved, and • When and how other math materials are implemented with the existing items.	The synopsis of one teacher interview includes: • How the resources may be improved, *OR* • When and how other math materials are implemented with the existing items. The response may lack clarity.	The synopsis of the two teacher interviews includes: • How the resources may be improved, *OR* • When and how other math materials are implemented with the existing items.	The synopsis of the two teacher interviews includes: • How the resources may be improved, and • When and how other math materials are implemented with the existing items. .
Phase 3 Combined Analysis: Use results from phases I and II to discuss how the ideal curricula is implemented by the teachers. *NCTM NCATE 6d*	How the ideal curricula is implemented by the teachers is *NOT* discussed.	How the ideal curricula is implemented by the teachers is discussed but not related to information gained during Phase 1 and 2.	How the ideal curricula is implemented by the teachers is discussed using information gained during Phase 1 and 2 but lacks clarity.	How the ideal curricula is implemented by the teachers is discussed using information gained during Phase 1 and 2.
Phase 3 Combined Analysis: Use results from phases I and II to discuss if the implemented curricula meets the expectations of the ideal curriculum.	The implemented curricula meeting the expectations of the ideal curricula is *NOT* discussed in the paper.	The implemented curricula meeting the expectations of the ideal curricula is discussed but not related to information gained during Phase 1 and 2.	The implemented curricula meeting the expectations of the ideal curricula is discussed using information gained during Phase 1 and 2 but lacks clarity.	The implemented curricula meeting the expectations of the ideal curricula is discussed using information gained during Phase 1 and 2.

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Phase 3 Combined Analysis: Use results from phases I and II to discuss how you would plan to proceed in working with the teachers based on their responses, as if you were a mathematics specialist, coach, or lead mathematics teacher. Describe suggestions you would give to help the teachers with their teaching and what resources would be helpful and supportive in these efforts. *NCTM NCATE 6d*	From the lens of a mathematics specialist, coach, or lead teacher, a discussion is *NOT* included for the following topics: • How you plan to proceed in working with the teachers based on their responses, • A description of suggestions you would give to help the teachers with their teaching, and • What resources would be helpful and supportive in these efforts.	From the lens of a mathematics specialist, coach, or lead teacher, a discussion summarizes one of the following: • How you plan to proceed in working with the teachers based on their responses, • A description of suggestions you would give to help the teachers with their teaching, and • What resources would be helpful and supportive in these efforts. More than one item may be included but lack clarity.	From the lens of a mathematics specialist, coach, or lead teacher, a discussion summarizes two of the following: • How you plan to proceed in working with the teachers based on their responses, • A description of suggestions you would give to help the teachers with their teaching, and • What resources would be helpful and supportive in these efforts. Items may all be included but lack clarity.	From the lens of a mathematics specialist, coach, or lead teacher, a discussion summarizes: • How you plan to proceed in working with the teachers based on their responses, • A description of suggestions you would give to help the teachers with their teaching, and • What resources would be helpful and supportive in these efforts.

CLASS CONSTRUCTED CURRICULUM TASKS RUBRIC

(*NCTM NCATE 3a, 4b, 4c, 4d, 4e, 6d)*

	Does Not Meet Expectations 0	**Below Expectations 1**	**Meets Expectations 2**	**Exceeds Expectations 3**
Goals/Objectives for the ideal curriculum *NCTM NCATE 3a*	The following are *NOT* stated, explained, and connections given: • Goals (NCTM Process Standards), and • Objectives (VSOL and Mathematical Practices)	The following are just stated: • Goals (NCTM Process Standards), and • Objectives (VSOL and Mathematical Practices)	The following are stated and explained: • Goals (NCTM Process Standards), and • Objectives (VSOL and Mathematical Practices)	The following are stated, thoroughly explained, and connections given: • Goals (NCTM Process Standards), and • Objectives (VSOL and Mathematical Practices)
Task #1 Identifying Info: a. Grade level b. Major concept c. Objectives/goals d. Prerequisite knowledge e. Technology (if enhances learning) *NCTM NCATE 3a, 4e*	The following are *NOT* included: a.b. Grade level and major concept of task are stated. e. Technology stated. The following are missing: c. Objectives & goals d. Prerequisite knowledge	The following are included: a.b. Grade level and major concept of task are stated. e. Technology stated. The following are included but very weak or one is missing: c. Objectives & goals are stated. d. Prerequisite knowledge is complete and extensive.	The following are included: a.b. Grade level and major concept of task are stated. e. Technology stated with clear explanations regarding how it was to be used. The following are included but not complete or inclusive: c. Objectives & goals are stated. d. Prerequisite knowledge is complete and extensive.	All of the following are included: a.b. Grade level and major concept of task are stated. c. Objectives & goals are stated. d. Prerequisite knowledge is complete and extensive. e. Technology stated with clear explanations regarding how it was to be used.
Task #1 Plans/Materials: a. Teacher Notes b. Student Handout *NCTM NCATE 3a, 4b, 4c, 4d, 4e*	Teacher notes and student handout are *NOT* provided.	Teacher notes are inadequate for teachers to follow and apply with students. Student handout is not	Teacher notes are provided but gaps exist making it unclear for teachers to follow and apply with students.	Teacher notes are extensive and sufficient for teachers to follow and apply with students. Student handout is clear,

		clear and/or easy to follow. Handout has many errors.	Student handout is clear, easy to follow, and few errors.	easy to follow, and free of errors.
Task #1 Differentiation: a. Differentiation/diversity b. Modifications for other grade levels within grade band *NCTM NCATE 4c, 4d*	Teacher notes *do NOT* include: How the task addresses differentiation and diversity, Provides modifications for other grade levels in your grade band.	Teacher notes: Explains how the task addresses differentiation and diversity with major gaps that aid in teachers being able to follow. Provides modifications for few grade levels in your grade band.	Teacher notes: Explains how the task addresses differentiation and diversity but lacks clarity. Provides modifications for most of the grade levels in your grade band.	Teacher notes: Thoroughly explains how the task addresses differentiation and diversity Provides modifications for other grade levels in your grade band.
Task #2 Identifying Info: a. Grade level b. Major concept c. Objectives/goals d. Prerequisite knowledge e. Technology (if enhances learning) *NCTM NCATE 3a, 4e*	The following are NOT included: a.b. Grade level and major concept of task are stated. e. Technology stated. The following are missing: c. Objectives & goals d. Prerequisite knowledge	The following are included: a.b. Grade level and major concept of task are stated. e. Technology stated. The following are included but very weak or one is missing: c. Objectives & goals are stated. d. Prerequisite knowledge is complete and extensive.	The following are included: a.b. Grade level and major concept of task are stated. e. Technology stated with clear explanations regarding how it was to be used. The following are included but not complete or inclusive: c. Objectives & goals are stated. d. Prerequisite knowledge is complete and extensive.	All of the following are included: a.b. Grade level and major concept of task are stated. c. Objectives & goals are stated. d. Prerequisite knowledge is complete and extensive. e. Technology stated with clear explanations regarding how it was to be used.
Task #2 Plans/Materials: a. Teacher Notes b. Student Handout *NCTM NCATE 3a, 4b, 4c, 4d, 4e*	Teacher notes and student handout are NOT provided.	Teacher notes are inadequate for teachers to follow and apply with students. Student handout is not clear and/or easy to	Teacher notes are provided but gaps exist making it unclear for teachers to follow and apply with students. Student handout is clear,	Teacher notes are extensive and sufficient for teachers to follow and apply with students. Student handout is clear, easy to follow, and free of

		follow. Handout has many errors.	easy to follow, and few errors.	errors.
Task #2 Differentiation: a. Differentiation/diversity b. Modifications for other grade levels within grade band *NCTM NCATE 4c, 4d*	Teacher notes *do NOT* include: How the task addresses differentiation and diversity, Provides modifications for other grade levels in your grade band.	Teacher notes: Explains how the task addresses differentiation and diversity with major gaps that aid in teachers being able to follow. Provides modifications for few grade levels in your grade band.	Teacher notes: Explains how the task addresses differentiation and diversity but lacks clarity. Provides modifications for most of the grade levels in your grade band.	Teacher notes: Thoroughly explains how the task addresses differentiation and diversity Provides modifications for other grade levels in your grade band.
Reflection of lesson taught includes: a. What went well with the task b. What did not go well with the task *NCTM NCATE 6d*	Reflection of the task taught *does NOT* include: a. What went well with the task, and b. What did not go well with the task.	Reflection of the task taught includes: a. What went well with the task, and b. What did not go well with the task. Statements for the above are *not* justified with events, quotes, or actions of students.	Reflection of the task taught includes: a. What went well with the task, and b. What did not go well with the task. Statements for the above are weakly justified with events, quotes, or actions of students.	Reflection of the task taught includes: a. What went well with the task, and b. What did not go well with the task. Statements for the above are justified with events, quotes, or actions of students.
Reflection of lesson taught includes: a. Strategies intended for student to use b. Strategies the students *did* use in addition to what was expected *NCTM NCATE 3a, 6d*	Reflection of the task taught *did NOT* include: A list of all possible strategies that the students might use. A list of strategies that the students *did* use.	Reflection of the task taught includes: An incomplete list of possible strategies that the students might use. A list of strategies that the students *did* use was not given.	Reflection of the task taught includes: A list of all possible strategies that the students might use. A list of strategies that the students *did* use was not given.	Reflection of the task taught includes: A list of all possible strategies that the students might use. A list of strategies that the students *did* use.
Reflection of lesson taught includes: • Two student work samples – annotations addressing their work and how it related to the task expectations.	Reflection of the task taught did NOT include work from 2 students.	Reflection of the task taught includes: Work from 2 students. Work is *not* annotated with comments about their progress, actions, and how it related to the task	Reflection of the task taught includes: Work from 2 students. Work is annotated with comments about their progress and actions however comments are	Reflection of the task taught includes: Work from 2 students. Work is annotated with comments about their progress, actions, and how it related to the task

NCTM NCATE 3a, 6d		expectations.	not insightful. The work is not related to the task expectations.	expectations.
Presentation: Each group will present during the last class an overview of their collection of tasks, goals/objectives and overview of a task(s), and how it may be modified for usage in vertical alignment. *NCTM NCATE 6d*	Presentation is NOT given.	Some team members take an active role. Presentation includes: Overview of the collection of tasks, and Goals and objectives of the tasks. Specifics for the one task are not given.	All team members take an active role. Presentation includes: Overview of the collection of tasks, and Goals and objectives of the tasks. For one task: Overview of a task is unclear, and Modifications for usage in vertical alignment are unclear or does not include all grades in grade band.	All team members take an active role. Presentation includes: Overview of the collection of tasks, and Goals and objectives of the tasks. For one task: Team shares overview of a task, and How it may be modified for usage in vertical alignment for all grades in grade band.