

**George Mason University**  
**EDCI 552:C02 MATH METHODS FOR THE ELEMENTARY CLASSROOM (3)**  
*15 hours of field work in math in the classroom\**  
Summer 2014

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<i>Office Hours</i>	By appointment

**June 30, 2014 - Aug 06, 2014**

Week 1: June 30 – July 3: Meet Robinson A101 MTWR ~9:30 am - 11:20 pm

Week 2: July 7-10: Meet Robinson A101 MTWR ~9:30 am - 11:20 pm

Week 3\*: July 14-18: Meet Providence Elementary School in Fairfax ~8:45 – 12:15 pm

Week 4\*: July 21-25: Meet Providence Elementary School in Fairfax ~8:45 – 12:15 pm

Week 5: Jul 28 - July 30: Meet Robinson A 101 MTWR ~9:30-11:00

Week 6: Aug 4 – Aug 6: Meet Robinson A 101 MTWR ~9:30-11:00

**\*Field component hours are woven into course work hours during the last two weeks of course.**

**NB: EDCI 547: TECHNOLOGY in the MATH CLASSROOM meets July 11, July 31/Aug 1 and Aug 7/8**

*Co-facilitators/Clinical Faculty*

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**Required Text**

Van De Walle, J., Karp, K. S., & Bay-Williams, J. M. (2012). *Elementary and Middle School Mathematics: Teaching Developmentally*. (8<sup>th</sup> edition) New York: Allyn & Bacon.

## I. Course Description

An introduction to methods for teaching all children, including those from non-mainstreamed populations, developmentally appropriate topics in arithmetic, geometry, algebra, probability and statistics. This is a hands-on, activity, workshop-oriented experience. Students work with manipulatives and technologies to explore mathematics, solve problems, and learn ways to teach mathematics content to children. Field experience is required.

Prerequisite: Admission to the Elementary Education Licensure Program

## II. Student Outcomes

This course will enable students to:

- A. Know what constitutes the essential topics in mathematics of the modern early and intermediate grades school program.
- B. Identify and use selected manipulatives and technology such as Linking Cubes, Attribute Blocks, Geoboards, Base-10 Blocks, Fraction Circles, Tangrams, calculators, and computers to teach appropriate mathematics content topics in the early and middle grades.
- C. Identify and use various instructional strategies and techniques (cooperative and peer group learning, activity centers, laboratories and workshops, teacher-directed presentations, etc.) to teach mathematical content topics appropriate for the early and intermediate grades to all children including those from non-mainstreamed populations.
- D. Identify and use alternative methods for assessing students' work in mathematics in the early and intermediate grades.
- E. Solve problems in the mathematical content areas of logic, number theory, geometry, algebra, probability, and statistics appropriate for adaptation to the early and intermediate grades.
- F. Know and explain what is a standards-based mathematics curriculum, what are the key elements of the National Council of Teachers of Mathematics Principles and Standards for School Mathematics and what are the key elements of the Virginia Standards of Learning for Mathematics.

## III. Relationship to Program Goals and Professional Organizations

*Student Outcomes Referenced to Selected National Standards*

Course Student Outcomes (above)	NCTM Principles and Standards	INTASC
A	S1, S2, S3, S4, S5	P1, P7
B	S10	P1, P2, P6
C	P1, P2, P3, P4, P6	P1, P2, P3, P4
D	P5	P3, P8
E	S1, S2, S3, S5, S6	P4, P6
F	S1-10, P1-6	P1, P7, P9

*Key:*

NCTM Principles and Standards = National Council of Teachers of Mathematics Principles and Standards for School Mathematics (2000), where P = principles and S = standards.

INTASC = Standards for Licensing Beginning Teachers, where P = principles

## IV. Nature of Course Delivery

In this course we will begin an inquiry into mathematics teaching and learning that will guide you in your first teaching job and give you the tools that will enable you to continue to inquire and learn as part of your work as a teacher. Class sessions will be interactive and will include a variety of hands-on experiences with concrete and virtual manipulatives appropriate for elementary school mathematics. We will explore the teaching of mathematics, investigating both *what* to teach and *how* to teach it. We will explore what it means to do mathematics and what it means to understand mathematics through individual, small group, and large group mathematical problem solving. We will investigate ways to represent understandings of mathematical concepts, communicate reasoning about mathematical ideas, and construct mathematical arguments. We will investigate and read about ways children might represent mathematical concepts, looking at ways to help children build connections and see relationships among mathematical ideas. We will explore characteristics of a classroom environment conducive to mathematical learning by reading and discussing the importance of mathematical tasks, mathematical tools, the roles of teachers and students, and the assessment of mathematical understanding. Attendance and engaged participation is essential.

## V. Required Texts & Readings

Van De Walle, J., Karp, K. S., & Bay-Williams, J. M. (2012). *Elementary and Middle School Mathematics: Teaching Developmentally*. (8<sup>th</sup> edition) New York: Allyn & Bacon.

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## VI. Course Requirements and Assignments

### Guidelines for Achievement

1. Be on time.
2. Come ready and prepared to learn.
3. Respect your rights & the rights of others to learn.
4. Work at learning.
5. Ask for support.

The assignments across the semester are intended to further your understandings of what it means to teach, learn, and assess mathematics in light of current reforms in mathematics education. All assignments are to be turned in to your instructor on time.

**LATE ASSIGNMENTS:** Late work will not be accepted for full credit. If the student makes prior arrangements with the instructor, assignments turned in late will receive a 10% deduction from the grade per late day or any fraction thereof (including weekends and holidays). Type all papers in 12 point Times New Roman double-spaced using one-inch margins.

Anything you submit should have a file name following this form: Lastname\_Firstname\_AssignmentName

Assignment	Possible points
Concept Map #1 (due July 1)	30
Mathematics Content/Pedagogy Response #1 (due July 2)	30
Mathematics Content/Pedagogy Response #2 (due July 3)	30
Concept Map #2 (due by July 16)	30
Mathematics Content/Pedagogy Response #3 (due by July 28) Reflection on center activity	30
Mathematics Content/Pedagogy Response #4 (due by July 30) Reflection on lesson	30
Let's Do Math (due by July 1)	30
Let's Do Math (due by July 3)	30
Let's Do Math (due by July 8)	30
Let's Do Math (due by July 10)	30
Let's Do Math (due by July 29)	30
Let's Do Math (due by July 31)	30
Let's Do Math (due by Aug 5)	30
Daily Observation/Reflection (July 14-18)	30 each
Individual Student Assessment – Plan (Draft 7/7) Final due by day of assessment	60
Individual Student Assessment – Report Final Due 7/23	120
Mini Lesson/Center Activity (Draft -7/9) Final due teaching day	90 - 120
M <sup>3</sup> Lesson Plan (Draft 7/10) Final due teaching day	120 - 180
In-Class Learning Experiences	360
Final Concept Map (due by Aug 6)	120-180

#### A. Mathematics Content/Pedagogy Responses ~ Math Journals, Memos and Reflections, Let's Do Math

These are short responses that focus on mathematics content in the elementary grades, with some questions focusing on methodological content. Responses should be posted on Blackboard unless otherwise noted. For each assignment, respond to at least one other student in the class with either a comment or a question.

These journal entries should be an *in-depth* reflection. In particular,

1. Provide a brief summary of what you learned/covered that day in the class/camp (you can refer to a rich problem, reference your readings; student work).
2. Reflect upon the connections within mathematics and/or between mathematics and other disciplines.(Math Knowledge Connections)
3. Reflect upon how your work today could impact your work as an elementary school teacher. In particular, discuss how you plan to incorporate some aspect of what you learned today into a lesson you teach. (Math Knowledge for Teaching)

Writing these memos will provide you with the opportunity to think about mathematics, about your work for the day and how you might use what you learned in your practice as an elementary school teacher. The journals will be graded on completeness and on the quality of the reflection. There is no right or wrong answer for any of the pieces of the journal.

Let's Do Math will be graded based on the mathematics shown and the reflection as above.

***Rubric***

0 points	Response is not completed yet
10 point	Response is has been written; the requirements for length and depth need to be reviewed and revised.
20 points	Response is completed (all requirements met). Ideas could be developed and extended.
25 points	Response is completed (all requirements met). Ideas are well-developed. Respond to at least one other student's memo.
30 points	Response is completed (all requirements met) and ideas are well-developed and creative. Strong and meaningful connections are made to reading and/or experiences from class. Respond to at least one other student's memo.

**B. Individual Student Assessment – Performance Based Assessment for the Course**

In order to plan effective instruction, you will need to know how to assess children's knowledge of mathematical concepts. One way to assess children's thinking is a diagnostic assessment. This assignment has two parts: (1) Design a plan for the assessment, assessing a specific mathematics topic using concrete, pictorial and abstract representations, (2) Conduct the assessment with a child and write a report describing the outcome of the assessment. Based upon feedback from the instructor on your plan, you may make modifications to the final plan and report.

Include rubric - bullet key points in rubric. (Questions should be bulleted.)

Include sections for PBA.

**C. Lesson Plans, Mini Lesson/Center Plans, and Presentations**

You are required to plan, teach, and complete a formal summary for two mathematics lessons during your field placement (summer camp). The first lesson (mini lesson/center activity) may be taught in a small group setting, while the other lesson (M<sup>3</sup> lesson) will be for the entire class. Integrate the use of mathematics tools (manipulatives, calculators, and computers) and representations (concrete, pictorial, symbolic) to provide children with an interactive, conceptually-based mathematics experience. The lesson plan summaries are a three-phase process: (1) Design the lesson plan, (2) Teach the lesson in your classroom, and (3) Collect and report evidence of student learning from the lesson in a reflection.

Center activities will be approximately 20 minutes.

**D. Teaching Mathematics Concept Map**

You will begin to develop your own concept map of what it means to be a teacher of mathematics. Through your readings and experiences you will refine the concept map. Your final concept map should reflect your journey through this course, the components to teaching mathematics, and the skills needed to be an excellent teacher of mathematics.



## THE LESSON

### WHAT IS THE MATH THAT KIDS WILL DISCOVER OR HAVE AN AH-HA ABOUT? WHERE ARE THE PROCESS STANDARDS AND PRACTICES WITHIN YOUR LESSON?

#### Objectives

- The objectives clearly state what students will do during the lesson.
- The objectives clearly state the mathematics content/essential understandings of the lesson.
- The objectives are tied to state/national standards.
- The objectives are tied to the assessment; this information is provided in the assessment section of the report.

#### Materials

- A list of materials used during the lesson is provided.
- A copy of the materials is included with the lesson.
- A variety of materials are used in each lesson (manipulatives, technology, etc.).
- The lesson integrates the use of mathematics tools (manipulatives, calculators, computers) and/or representations (concrete, pictorial, symbolic).
- The teacher creates materials for the lesson.
- Appropriate materials are selected for the concepts being taught.
- The lessons do not overuse worksheets.

#### Procedure

- The lesson is substantive in length, breadth, and depth.
- Any questions and mathematics content the teacher uses during the lesson are included in the procedures.
- The procedures thoroughly and completely outline what the teacher will do during the lesson; How did you present the lesson?
- The procedures are in a bulleted list, approximately 1-2 pages in length.
- The procedures provide enough detail to allow another person to teach the lesson.*

<b>ENGAGE</b>	The procedures include an introduction for activating prior knowledge.
<b>EXPLORE (Hands on, Minds on)</b>	The procedures show that students are engaged in <u>doing</u> mathematics during the lesson.
<b>EXPLAIN</b>	The procedures thoroughly and completely outline what the students will do during the lesson. Estimated times for each phase are provided in parentheses. Students explain their understanding of concepts and processes. New concepts and skills are introduced as conceptual clarity and cohesion are sought
<b>ELABORATE</b>	Activities allow students to apply concepts in contexts, and build on or extend understanding and skill. The procedures include a plan for closing the lesson and checking for understanding.
<b>EVALUATE</b>	Students assess their knowledge, skills and abilities. Activities permit evaluation of student development and lesson effectiveness. Connecting to other concepts

#### Differentiation

- Gearing up and gearing down
- A list of adaptations for individual students is included.
- Specific information must be provided on individual students in the class and the accommodations made for those children. (General comments are not appropriate for this requirement.)

#### Assessment / Work Samples

- The assessment used during the lesson is described in approximately ½ -1 pages.
- The description of the assessment is clear enough that another person could conduct the assessment; What was the assignment?
- The assessment describes what the teacher does to assess the students.
- The assessment describes in detail what the students do to demonstrate their understanding of the concept.
- An example of the assessment conducted during the lesson is attached to provide documentation of what students did during the lesson (i.e., written work, drawings, worksheets, photographs, checklists, anecdotal records).

The objectives are tied to the assessment; this information is provided in the assessment section of the report.

## **Reflection**

The reflection is 1-2 pages in length.

A portion of the reflection describes the mathematics teaching and learning that occurred during the lesson and how it related to the lesson plan prepared ahead of time.

A portion of the reflection discusses those elements of the lesson that went well and those that you would do differently for more success.

A portion of the reflection discusses at least three changes or improvements that you would make to the lesson if you were teaching it again (bullet these changes/improvements).

A portion of the reflection identifies one important idea you learned about teaching and learning mathematics from the lesson. (Ideas that focus on behavior management strategies are not acceptable for this requirement.)

A portion of the reflection identifies one important teaching skill you plan to work on the next time you teach a mathematics lesson.

## **Individualized Student Assessment Guidelines – PLAN** (Performance Based Assessment for the Course)

### ***The Child:***

Describe the child you plan to assess. Include information you gathered about the child (grade level, age, gender, race, and academic ability level). What do you know about the child's level of understanding about the topic *before* the assessment?

### ***The Mathematics Concept:***

Select one specific mathematics concept to assess during the assessment. Examples of concepts might include patterns, sorting, addition of whole numbers, division of fractions, finding averages, percent, geometric shapes, or length measurement. Tell why this concept is appropriate for this child at this particular grade level.

### ***Different Forms of Representation:***

During the assessment, assess the child using three different forms of representation. Identify the three different forms of representation you will use during the assessment with at least one example in each form. *Concrete* representations include manipulatives, measuring tools, or other objects the child can manipulate during the assessment. *Pictorial* representations include drawings, diagrams, charts, or graphs that are drawn by the child or are provided for the child to read and interpret. *Symbolic* representations include numbers or letters the child writes or interprets to demonstrate understanding of a task.

### ***Tasks & Questions:***

Design tasks and questions that use three different forms of representation (concrete, pictorial, abstract symbols) to diagnose the child's understanding of ONE basic concept. Go beyond the basic level of determining the child's factual knowledge of the concept by asking questions that determine how much the child understands about the concept. For example, suppose you are assessing the concept of ADDITION. (1) Create several tasks where the child uses concrete manipulatives to demonstrate her understanding of addition; ask questions about the child's understanding of the addition tasks with manipulatives. (2) Create several tasks where the child is asked to create or interpret drawings to demonstrate her understanding of addition; ask questions about the child's understanding of these tasks with pictorial models; (3) Create several tasks where the child uses abstract symbols (and letters) to demonstrate her understanding of addition; ask questions about the child's understanding of these addition tasks using the symbols. All questions should be bulleted and follow-up questions sub-bulleted.

**Individualized Student Assessment Guidelines – REPORT**  
**(Performance Based Assessment for the Course)**

*The following sections should be written in past tense.*

*The Child*

*The Mathematics Concept*

*Different Forms of Representation*

*Tasks & Questions* (All questions should be bulleted and follow-up questions sub-bulleted)

*Evaluation of the Student’s Understanding*

*The following sections should be written in present or future tense.*

*Next steps instructionally/academically for student*

*Reflection and evaluation of the assessment process*

Also included in the final report:

- **Work samples should be included and appropriately inserted into the document or as an appendix.**
- **Excerpts (portions of a verbal interaction) should be included.**

*General comments about writing:*

Capitalization: I enjoy teaching math because... (math is not capitalized)

Note spelling: Quiet versus quite

The correct spelling of **definitely**. DE-finite-LY

~~I don’t doubt~~ -> I believe, I think, I predict...

Be VERY careful prescribing “worksheets” for what a child should do. If this is your recommendation, be clear why this is the an appropriate next step.

“Student will be able to discover graphing concepts on a deeper level.” This comment is too broad. Be specific with what you mean.

## SCORING RUBRIC FOR CENTER ACTIVITY/MINI LESSON & LESSON PLANS

Name: \_\_\_\_\_

<i>Criteria</i>	<i>Expectations</i>	<i>Possible Points</i>
Objectives	<ol style="list-style-type: none"> <li>1. The objectives clearly state what students will do during the lesson.</li> <li>2. The objectives clearly state the mathematics content/essential understandings of the lesson and the objectives are tied to state/national standards.</li> </ol>	_____ (10)
Materials	<ol style="list-style-type: none"> <li>1. A list of materials used during the lesson is provided.</li> <li>2. Copies of any handouts or worksheets used during the lesson are included.</li> <li>3. The lesson integrates the use of mathematics tools (manipulatives, calculators, computers) and/or representations (concrete, pictorial, symbolic).</li> <li>4. Appropriate materials are selected for the concepts being taught.</li> <li>5. The lesson does <i>not overuse</i> worksheets.</li> </ol>	_____ (5)
Procedure	<ol style="list-style-type: none"> <li>1. The lesson is substantive in length, breadth, and depth.</li> <li>2. The procedures thoroughly and completely outline what the teacher will do during the lesson. How did you present the lesson?</li> <li>3. The procedures thoroughly and completely outline what the students will do during the lesson.</li> <li>4. The procedures show that students are engaged in <u>doing</u> mathematics.</li> <li>5. Estimated times for each phase are provided in parentheses.</li> <li>6. The procedures provide enough detail to allow another person to teach the lesson.</li> <li>7. Any questions or mathematics content the teacher uses during the lesson are included.</li> <li>8. The procedures include an introduction for activating prior knowledge and a plan for closing the lesson.</li> </ol>	_____ (40)
Differentiation	<ol style="list-style-type: none"> <li>1. A list of adaptations for individual students is included.</li> <li>2. Specific information must be provided on individual students in the class and the accommodations made for those children. (General comments are <b>not</b> appropriate for this requirement.)</li> </ol>	_____ (10)
Assessment	<ol style="list-style-type: none"> <li>1. The assessment is tied to the lesson objectives.</li> <li>2. The assessment is described in enough detail that another person could conduct the assessment.</li> <li>3. The assessment describes what the teacher does to assess the students.</li> <li>4. The assessment describes anticipated student responses. What will students do to demonstrate their understanding of the mathematics? What student misconceptions do you predict?</li> </ol>	_____ (10)
Work Samples	<ol style="list-style-type: none"> <li>1. An example of the assessment conducted during the lesson is attached to provide documentation of what students did during the lesson (i.e., written work, drawings, worksheets, photographs, checklists, anecdotal records).</li> <li>2. Brief analysis of the outcome of the assessment.</li> </ol>	_____ (5)
Reflection	<ol style="list-style-type: none"> <li>1. The reflection describes the mathematics teaching and learning that occurred during the lesson and how it related to the lesson plan prepared ahead of time.</li> <li>2. The reflection discusses those elements of the lesson that went well and those that did not.</li> <li>3. The reflection discusses at least three changes or improvements that you would make to the lesson if you were teaching it again.</li> <li>4. The reflection identifies one important idea you learned about teaching and learning mathematics as well as one important teaching skill you plan to work on the next time you teach a mathematics lesson. (Ideas that focus on behavior management strategies are <b>not</b> acceptable for this requirement.)</li> </ol>	<p style="text-align: center;">Done individually on Bb _____ (20)</p>
Total Points		_____ (100)

## Scoring Rubric for Student Report

Criteria	Exceeds Requirements (A)	Meets Requirements (A-,B+,B)	Needs Improvement (C)	Inc.	Weight
Is the required information present about the <u>child</u> assessed?	5 In addition to the required information, the report includes information about the child's performance in other academic, social, or behavioral areas. <b>Cite references.</b>	4 3 2 The report includes the child's grade level, age, gender, race, academic ability level, and the child's level of understanding about the mathematics concept.	1 One or more of the required descriptive items about the child is missing.	0	x .05 =
Has the teacher selected one specific mathematics <u>concept</u> and assessed the concept using different <u>forms of representation</u> (concrete, pictorial, abstract)?	5 Information on age-appropriate variations of the mathematics concept was gathered in preparation for the assessment. One math concept is clearly described and mathematically accurate. Three different forms of representation, with different examples in each form, are designed for use in interesting and creative ways. Connections are made among representational forms. <b>Cite references.</b>	4 3 2 One age-appropriate mathematics concept is selected, mathematically accurate, and clearly described. Three different forms of representation are described and used appropriately to assess the mathematics concept. Different examples may be used within each representational form.	1 One or more mathematics concepts are selected. They may not be age-appropriate. The report is missing one or more forms of representation.	0	x .10 =
Do the <u>tasks and questions</u> match the specific mathematics concept being assessed? Is there variety in the tasks and questions used for each of the three different forms of representation?	5 In addition to the tasks/questions being aligned with the math concept, there are questions that differentiate and provide extensions for different levels of student performance. In addition to the variety of tasks/questions for each of the three forms of representation, tasks that show creativity and will be motivating for a child are included. <b>Cite references.</b>	4 3 2 The tasks and questions designed for the assessment are aligned with the mathematics concept being assessed. There are a variety of tasks and questions for each of the three forms of representation.	1 The tasks and questions designed for the assessment are not clearly aligned with the mathematics concept being assessed. The report is missing tasks/questions that address one or more of the forms of representation.	0	x .15 =
Are the child's <u>work samples</u> included with three different forms of representation present in the work samples? (pictures of work are acceptable)	5 In addition to the variety of work samples from the child showing examples in each of the three forms of representation, a creative way of providing an explanatory overview of the child's work is included.	4 3 2 There are a variety of work samples from the child included showing examples in each of the three forms of representation. (concrete, pictorial, abstract)	1 There is only one work sample in each of the three forms of representation or work samples from one form of representation are missing.	0	x .10 =
Is the required question and response assessment <u>excerpts</u> present?	5 The report includes key excerpts from the mathematics assessment that includes descriptive information on both the behaviors and the actual verbalizations that occurred during the assessment.	4 3 2 The report includes excerpts of the mathematics assessment using the teacher and the child's actual verbalizations from the assessment (T for teacher; C for child).	1 The report includes excerpts of the mathematics assessment, but some parts of the assessment conversation are limited.	0	x .15 =
Do the initial and follow-up <u>questions</u> used by the teacher demonstrate variety and higher levels of questioning? Are specific follow-up questions used appropriately?	5 The transcript shows that during the assessment, the teacher used a variety of questions to encourage the child to express his/her thinking, used many higher-level questions to encourage deeper thinking and responses from the child, and used specific follow-up questions to probe for understanding.	4 3 2 The transcript shows that during the assessment, the teacher used a variety of higher-level questions to encourage deeper thinking and appropriate follow-up questions to probe for understanding.	1 The transcript shows that during the assessment, the teacher used very few probing and follow-up questions when a specific follow-up question would have been appropriate.	0	x .10 =
Does the <u>evaluation</u> accurately represent the child's current level of understanding on this concept using supporting evidence and work samples from the assessment?	5 The evaluation provides an accurate and detailed description of the child's current level of understanding on the concept. Many different and specific examples from the assessment are given, including the child's quotations, student work, and information from other sources on math development, to provide supporting evidence for the evaluation of the child.	4 3 2 The evaluation provides an accurate description of the child's current level of understanding on the mathematics concept. Different examples from the assessment are given, including the child's quotations and student work, to provide supporting evidence for the evaluation.	1 The evaluation provides a minimal description of the child's understanding on the mathematics concept. A few examples from the assessment are given, but there is not enough information to provide supporting evidence for the evaluation.	0	x .15 =
Does the instructional plan prescribe developmentally appropriate <u>next steps</u> for instruction and take into account the child's current level of understanding on this concept?	5 The plan is a creative, detailed description of developmentally appropriate next steps for instruction taking into account the child's current level of understanding. The plan identifies many specific examples of activities and tasks that would further enhance this child's knowledge of this concept. Information from other sources on math development and child development was used. Cite references.	4 3 2 The instructional plan describes developmentally appropriate next steps for instruction. The plan identifies several specific examples of tasks that would be appropriate to further enhance this child's knowledge on this concept. The plan describes these tasks in relation to the child's current level of understanding.	1 The plan describes some next steps for instruction that may not be developmentally appropriate. The plan gives general (rather than specific) examples of activities and tasks for the child. The tasks may not be appropriate either for the child or the development of the math.	0	x .10 =
Is there an appropriate reflection and evaluation of the assessment	5 In addition to the required information, the report	4 3 2 The report includes a reflection and	1 The report does not include one or more of	0	x .10

process?	includes a detailed analysis, self-reflection, and self-evaluation of the assessment process.	evaluation on the assessment process including the required elements.	the required elements for the reflection.		=
<b>TOTAL SCORE</b>					
<b>A</b>	<b>5.0 – 4.5</b>				
<b>A-</b>	<b>4.49 – 3.5</b>				
<b>B+</b>	<b>3.49 – 2.5</b>				
<b>B</b>	<b>2.49 – 2.0</b>				
<b>C</b>	<b>1.99 – 1.0</b>				
<b>Unsatisfactory</b>	<b>0.99 or below</b>				

## Schedule for Week 1: June 30 – July 3: Assignments & Readings

Dates	Topic/Learning Experiences	Readings & Assignments
Monday, June 30	<p>What does it mean to know and do mathematics?</p> <p>What are the common core mathematics practices and how can we address them as students learn mathematics?</p> <p>How do we address NCTM content and process standards as students learn mathematics?</p> <p>How do students learn mathematics through problem solving?</p> <p>How might we plan in the problem-based classroom?</p> <p>Explore: <a href="http://nctm.org">http://nctm.org</a></p>	<p><b><i>Setting the stage for Best Practices</i></b>            Read Van de Walle: Chapters 1-2 prior to class and answer the following: Journal Prompt 1 on Bb: What does it mean to do mathematics? How do your experiences in math shape how you think about teaching mathematics? Read</p> <p>Van de Walle: Chapters 3-4            Complete 3 math problems in Chapter 3</p> <p>Journal Prompt #1 on Bb: Identify the problems you chose. What was challenging? What was easy? Could you solve the problem in a different way? What might be the benefits of doing mathematics before your students do the math problem?</p> <p>Then reply to at least one classmate on Bb.</p> <p>Develop first draft of Concept Map.</p>
Tuesday, July 1	<p>How do we assess students on their mathematical understanding?</p> <p>How do we support all learners?</p> <p>How do we differentiate using cognitive load</p> <p>Smith et al., task sort</p>	<p><b><i>Setting the stage for Best Practices</i></b>            Read Van de Walle: Chapters 5-6</p> <p>Watch a lesson from the Teaching library on <a href="http://learner.org">http://learner.org</a></p> <p>Journal Prompt #2 on Bb: What video did you watch? What are your top three “take-aways” from the video?</p> <p>Then reply to at least one classmate on Bb.</p> <p><i>Let’s Do Math</i> #1 – problem/activity will be sent via email or posted on Bb</p>
Wednesday, July 2	<p>What experiences develop early number sense?</p> <p>Planning for Instruction</p> <p>Number sense activities</p>	<p><b><i>Development of Mathematical Concepts and Procedures</i></b>            Read Van de Walle: Chapters 8-9</p> <p>Find a lesson for early number sense. Be prepared to present in class.</p>
Thursday, July 3	<p>Counting, Patterns &amp; Place Value/Basic Facts &amp; Whole Number Operations</p>	<p>Van de Walle:            Chapter 10 Helping Children Master the Basic Facts</p> <p>Bring two words problems the match <math>36 \div 9</math> (two different types of division)</p> <p><i>Let’s Do Math</i> #2 – problem/activity will be sent via email or posted on Bb</p>

**Week 2: July 7-10: Assignments & Readings**

**Week 5: July 28- 30: Assignments & Readings**

**Week 6: August 4 – 6: Assignments & Readings**

<b>Dates</b>	<b>Topic/Learning Experiences</b>	<b>Readings &amp; Assignments due for class</b>
Monday, July 7	Promoting Math Talk/Discourse  Continue exploring: Number Sense, Counting, Patterns & Place Value/Basic Facts & Whole Number Operations	Van de Walle:  Chapter 11 Developing Whole-Number Place-Value Concepts  Chapter 12 Developing Strategies for Whole-Number Computation  Assessment Plan Draft Due
Tuesday, July 8	Fermi Problems  What’s the difference between rounding, estimation, and computation?  Assessment – Conducting a Diagnostic Interview	Van de Walle:  Chapter 13 Using Computational Estimation with Whole Numbers  Assignment: xxxx  <i>Let’s Do Math #3</i> – problem/activity will be sent via email or posted on Bb
Wednesday, July 9	Multiple Representations ~ Algebraic Thinking: Generalizations, Patterns, and Functions	Van de Walle:  Chapters 14 Algebraic Thinking  Assignment: xxxx  <b>Mini Lesson/Center Plan Draft Due</b>
Thursday, July 10	Summing Up	Professional readings on Algebraic Thinking  Professional readings on Number Sense  <i>Let’s Do Math #4</i> – problem/activity will be sent via email or posted on Bb  <b>Lesson Plan Draft Due</b>
Monday, July 28	Understanding of Fractions Conceptually	Van de Walle:  Chapter 15 Developing Fractions Concepts  Assignment: Fraction problems using pictures & what does the remainder mean?  <b>Center/Mini Lesson Reflection Due</b>
Tuesday, July 29	Operations with Fractions	Van de Walle:  Chapter 16 Developing Strategies for Fraction Computation  Assignment: Come up with 2-5 questions to accompany “Region Relationship” for extensions and for remediation  <i>Let’s Do Math #5</i> – problem/activity will be sent via email or posted on Bb
Wednesday, July 30	Proportional Thinking  Decimals, Ratios, & Percent	Van de Walle:  Chapter 17 Developing Concepts of Decimals and Percents

		<p>Chapter 18 Proportional Reasoning</p> <p><b>Lesson Reflection Due</b></p> <p><i>Let's Do Math #6</i> – problem/activity will be sent via email or posted on Bb</p>
Monday Aug 4	Measurement & Geometry	<p>Van de Walle: Chapter 19 Measurement Concepts Chapter 20 Geometry</p>
Tues Aug 5	Data Analysis, Statistics, & Probability	<p>Van de Walle: Chapter 21 Developing Concepts of Data Analysis Chapter 22 Exploring Concepts of Probability</p> <p><i>Let's Do Math #7</i> – problem/activity will be sent via email or posted on Bb</p>
Wed, Aug 6	Moving on to Teach Mathematics	<b>Final Concept Map Due</b>

## Schedule for July 14-18: Assignments & Summer PDS Lesson Rounds

M3 Unit: At the Mall with Algebra. In this curriculum, students learn about variables, equations and expressions, logical reasoning, and problem solving strategies. There is a heavy emphasis on being able to communicate mathematical ideas verbally and in written form. The goal of the lessons is to introduce students to algebraic thinking while strengthening problem-solving and mathematical communication skills.

**Note: Final Lesson Plan due the day it is taught. Final Center/Mini Lesson Plan due the day it is taught.**

Dates	Topics/Learning Experiences	Readings & Assignments due for class
Monday, July 14	Targeted Observation: Questioning & Formative Assessment	Professional reading posted on Bb <ul style="list-style-type: none"> <li>- <i>Big Ideas</i> by Randy Charles</li> <li>- M<sup>3</sup> Curriculum Packet</li> </ul>
Tuesday, July 14	Targeted Observation: Facilitating Student Discourse	Professional reading posted on Bb <ul style="list-style-type: none"> <li>- <i>Orchestrating Discourse</i></li> <li>- <i>Multiple Ways to Solve Proportions</i></li> </ul>
Wednesday, July 16	Targeted Observation: Differentiation in Math Lessons & Assessment	Professional reading posted on Bb <ul style="list-style-type: none"> <li>- <i>Exploring Measurement Concepts through Literature</i></li> <li>- <i>Getting Started with Open-Ended Assessments</i></li> </ul>
Thursday, July 17	Targeted observation: Process Standards	Professional reading posted on Bb <ul style="list-style-type: none"> <li>- <i>Neurons and The Process Standards</i></li> <li>- <i>Three Balloons for Two Dollars</i></li> </ul> <p><b>Response #4 on Bb due by 11:59pm</b></p>
Friday, July 18	Center activities planned by interns	<b>Center Activity</b> <p><i>See syllabus for lesson plan guidelines – one per group</i></p> <p><i>Reflection will be done individually and posted on Bb (due by 11:59pm)</i></p> <p><b>Individual Student Plan Due by July 28 at 11:59 pm</b></p>
Monday, July 21	Teaching and Assessing Learning Lessons/Centers	Professional reading posted on Bb <p><i>Article</i></p> <p><b>Technology Review #5: Due by July 29</b></p>

Tuesday, July 22	Teaching and Assessing Learning Lessons/Centers	Professional reading posted on Bb <i>Article</i>
Wednesday, July 23	Assessing learning through student written work Lessons/Centers	<b>Individual Student Assessment Final Report Due</b> <b><i>Response #6 on Bb due</i></b>
Thursday, July 24	Lessons/Centers Prepare for Culminating Activities (Math/Robotics)	Professional reading posted on Bb - <i>Article</i>
Friday, July 25	Math and Robotics Fair	Final Reflection – Part 2 Final Reflection due

## **GSE SYLLABUS STATEMENT OF EXPECTATIONS:**

The Graduate School of Education (GSE) expects that all students abide by the following:

- A. Students are expected to exhibit professional behavior and dispositions. See <http://gse.gmu.edu/facultystaffres/profdisp.htm> for a listing of these dispositions.
- B. Students must follow the guidelines of the University Honor Code. See <http://oai.gmu.edu/the-mason-honor-code/> for the full honor code.
- C. Students must agree to abide by the university policy for Responsible Use of Computing. See <http://mail.gmu.edu> and click on Responsible Use of Computing at the bottom of the screen.
- D. Students with disabilities who seek accommodations in a course must be registered with the GMU Office of Disability Services (ODS) and inform the instructor, in writing, at the beginning of the semester. See <http://www2.gmu.edu/dpt/unilife/ods/> or call 703-993-2474 to access the ODS.

Approved March 2004, Revised June 2011.

## **MASON'S COLLEGE OF EDUCATION AND HUMAN DEVELOPMENT**

### *Student Expectations*

- Students must adhere to the guidelines of the George Mason University Honor Code [See <http://academicintegrity.gmu.edu/honorcode/>].
- 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/>].
- Students must follow the university policy for Responsible Use of Computing [See <http://universitypolicy.gmu.edu/1301gen.html>].
- 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.
- Students must follow the university policy stating that all sound emitting devices shall be turned off during class unless otherwise authorized by the instructor.\*
- Students are expected to exhibit professional behaviors and dispositions at all times.

### *Campus Resources*

- 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/>].
- 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/>].
- For additional information on the College of Education and Human Development, Graduate School of Education, please visit our website [See <http://gse.gmu.edu/>].
- \*The university has a policy that requests students to turn off pagers and cell phones before class begins; however, you may leave your cell phone on vibrate to receive emergency calls in class. If your phone is set to vibrate, then please keep your phone easily accessible, immediately accept the call so it does not continue to vibrate, say "please hold," and walk outside the room before beginning your conversation. Laptops and PDAs may be used in class during group and individual work time to maintain emergency contact and assist with you with your work, but laptops must be kept closed and PDAs face-down during whole class discussions. Register for campus alerts at <https://alert.gmu.edu>. An emergency poster exists in each classroom explaining what to do in the event of crises. Further information about emergency procedures exists on <http://www.gmu.edu/service/cert>.
- The College of Education and Human Development strives to represent a set of core values that drive the work of faculty and students. These values of collaboration, ethical leadership, innovation, research-based practice, and social justice are further described on the CEHD website <http://cehd.gmu.edu/values/>.