

**GEORGE MASON UNIVERSITY**  
**COLLEGE OF EDUCATION AND HUMAN DEVELOPMENT**  
**GRADUATE SCHOOL OF EDUCATION**  
**Elementary Education**

EDCI 552 001: Math Methods for the Elementary Classroom  
3 Credits, Spring 2016  
Mondays 4:30 p.m. – 7:10 p.m. Thompson Hall L019

**PROFESSOR(S):**

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**COURSE DESCRIPTION:**

**A. Prerequisites/Corequisites**

Admission to the elementary education licensure program.

**B. University Catalog Course Description**

Introduces methods for teaching all children topics in arithmetic, geometry, algebra, probability, and statistics in elementary grades. Focuses on using manipulatives and technologies to explore mathematics and solve problems.

**C. Expanded Course Description**

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.

## **NATURE OF COURSE DELIVERY**

This course includes multiple instructional strategies and formats including face to face and asynchronous online meetings. Individual session formats vary and may include lecture, small group/large group discussion, hands-on, interactive work, student presentations, and cooperative learning. Practical applications of theory are explored in group activities.

## **LEARNER OUTCOMES or OBJECTIVES:**

This course is designed to enable students to:

- A. Know what constitute 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 the learning progression in relation to the standards-based mathematics curriculum, the key elements of the National Council of Teachers of Mathematics Principles and Standards for School Mathematics, and the key elements of the Virginia Standards of Learning for Mathematics.

Additionally, this course supports the CEHD Core Values of collaboration, ethical leadership, research-based practice, social justice, and innovation. Statements of these goals are at <http://cehd.gmu.edu/values/>.

**PROFESSIONAL STANDARDS** (Interstate Teacher Assessment and Support Consortium (InTASC) & Association for Childhood Education International Elementary Education Standards (ACEI):):

| <b>Course Student Outcomes (above)</b> | <b>INTASC Standard (2011)</b> | <b>ACEI</b> |
|--|-------------------------------|-------------|
|--|-------------------------------|-------------|

|   |       |                         |
|---|-------|-------------------------|
| A Essential math  | #4    | 1.0                     |
| B Planning and Teaching using manipulatives                     | #7    | 3.1                     |
| C Instructional Strategies                                      | #8    | 1.0, 2.3, 3.1, 3.3, 3.4 |
| D Assessing   | #6    | 4.0                     |
| E Problem Solving   | #5    | 2.3                     |
| F Learner Development and understanding of Learning Progression | #2/#1 | 1.0                     |

|   |
|---|
| <b>INTASC Standard (2011)</b>   |
| <p><b>Standard #4: Content Knowledge</b></p> <p>The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.</p> |
| <p><b>Standard #7: Planning for Instruction</b></p> <p>The teacher plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.</p>          |
| <p><b>Standard #8: Instructional Strategies</b></p> <p>The teacher understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways.</p>                                      |
| <p><b>Standard #6: Assessment</b></p> <p>The teacher understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.</p>   |
| <p><b>Standard #5: Application of Content</b></p> <p>The teacher understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.</p>  |

Standard #1: Learner Development. The teacher understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.

Standard #2: Learning Differences

The teacher uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.

Association for Childhood Education International Elementary Education Standards 2007

**1.0 Development, Learning, and Motivation**--Candidates know, understand, and use the major concepts, principles, theories, and research related to development of children and young adolescents to construct learning opportunities that support individual students' development, acquisition of knowledge, and motivation.

**2.3 Mathematics**—Candidates know, understand, and use the major concepts and procedures that define number and operations, algebra, geometry, measurement, and data analysis and probability. In doing so they consistently engage problem solving, reasoning and proof, communication, connections, and representation;

**3.1 Integrating and applying knowledge for instruction**—Candidates plan and implement instruction based on knowledge of students, learning theory, connections across the curriculum, curricular goals, and community;

**3.5 Communication to foster collaboration**—Candidates use their knowledge and understanding of effective verbal, nonverbal, and media communication techniques to foster active inquiry, collaboration, and supportive interaction in the elementary classroom.

**4.0 Assessment for instruction**—Candidates know, understand, and use formal and informal assessment strategies to plan, evaluate and strengthen instruction that will promote continuous intellectual, social, emotional, and physical development of each elementary student.

| Course & PBA                                | INTASC  | ACEI   |
|---|---|--|
| 552 Math<br>Student Assessment<br>Interview | #4 Content Knowledge<br><br>#1 & #2 Learner<br>Development & Differences<br><br>#6 Assessment | 1.0 Development<br><br>2.3 Math<br><br>3.1 Planning Instruction<br><br>3.5 Communication<br><br>4.0 Assessment |

## **REQUIRED TEXTS:**

Van De Walle, J., Karp, K. S., & Bay-Williams, J. M. (2015). *Elementary and Middle School Mathematics: Teaching Developmentally*. (9th edition) New York: Allyn & Bacon

## **COURSE ASSIGNMENTS AND EXAMINATIONS:**

### **1. Assignment Descriptions:**

#### **A. Participation & Professional Dispositions (10%)**

*Addresses Learner Outcomes: A, B, C, D, E, F*

Rich, meaningful, problems will be assigned for each class session. Students are expected to complete these problems during class and incorporate their thinking about strategies used to solve the problems in class discussions. Work on problem sets will be shared in class and on occasion may be collected and evaluated. Students are expected to analyze and reflect on solution strategies, provide differentiated approaches to center activities, and actively participate in class discussions by applying field experiences and class readings. Professional dispositions are to be displayed at all times while interacting with the instructor and other students. Cell phones are not to be used during class. Laptops are to be used for instructional purposes only.

#### **B. Selecting & Sequencing Assignment (10%)**

*Addresses Learner Outcomes: A, C, D, E, F*

Determining how to share student work in class discussions is essential. This assignment will allow you to demonstrate your knowledge in determining which student work highlights the mathematical objective of a lesson. Students will be provided with a short passage centered on a teacher and the mathematical objective for that day, in addition to work samples. Students are expected to identify 2-3 work samples and explain the selection and sequencing of how they would lead a class discussion. A practice assignment will be completed on Week 2.

#### **C. Student Assessment Interview: Course Performance Based Assessment (30%)**

*Addresses Learner Outcomes: A, B, C, D, F*

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.

#### **D. Problem-based Lesson Plans & Written Summaries (30%)**

*Addresses Learner Outcomes: A, B, C, D, E, F*

You are required to plan, teach, and complete a formal summary for each mathematics lesson. Each lesson will place an emphasis on five practices that promote productive discussions: Anticipating, Monitoring, Selecting, Sequencing, and Connecting. Each lesson should be written in the Modified GMU Elementary Lesson Plan Format and follow the guidelines set forth by the grading rubric posted on Blackboard. Documents that should be included are: the lesson plan, reflection, anticipated student responses and student work samples.

- a. **Group Problem-Based Lesson Plan (15%):** The first lesson will be taught by a small group and presented to your classmates. Each group is expected to: 1) design a Power Point slide and e-mail it to your instructor the Wednesday before class; 2) anticipate possible student responses by solving the problem using all three representations (concrete, pictorial, abstract); and 3) bring 10 copies of the anticipated student responses to class on the day of the presentation. The group will complete one written reflection on this experience. See rubric/Blackboard for more detail.
- b. **Individual Problem-Based Lesson Plan (15%):** After teaching the Group Problem-Based lesson to their peers (in class), each individual will modify and teach this same problem to elementary students in a whole class setting. Each individual will complete a written reflection on this experience. See rubric/Blackboard for more detail. **This lesson should be video taped.**

#### **E. Mathematics Curriculum and Assessment Analysis: Illuminations/VDOE Lesson (20%)**

*Addresses Learner Outcomes: C, D, E*

The Mathematics Curriculum and Assessment Analysis will consist of teaching a lesson and using Edthena as a tool for reflection. Students will pick a lesson from the NCTM online resource Illuminations or the VDOE website that they will implement in a whole class setting of elementary students. Details for this assignment are on Blackboard. **This lesson should be video taped.** Students will analyze their videos using the Mathematical Quality of Instruction (MQI) framework. The MQI instrument examines the relationship between the teacher, students and mathematics content using five elements: richness of the mathematics; errors and imprecision; working with students and mathematics; student participation in meaning-making and reasoning; and connections between classroom work and mathematics. Students will need to register for a free MQI account:

[http://isites.harvard.edu/icb/icb.do?keyword=mqi\\_training](http://isites.harvard.edu/icb/icb.do?keyword=mqi_training)

#### **2. Assignment and examination weighting**

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 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).

Participation and Professional Dispositions (10%)

Selecting and Sequencing Assignment (10%)

Individual Student Assessment (30%)

Problem-Based Lesson Plan Summaries (30%)

Mathematics Content & Pedagogy Assessments (20%)

### 3. Grading policies

The mathematics education courses in GSE's Elementary Education Program integrate pedagogy and mathematics content appropriate for the elementary school grades. For students to earn a grade of A in the course, they must demonstrate excellence in *both* the pedagogical knowledge and the content knowledge of the mathematics appropriate at their level of teaching. Thus, the grading in the course is structured to help evaluate fairly student excellence in both areas. Problem sets and assessment work focuses primarily on ascertaining student excellence in handling mathematics content appropriate for the elementary grades, and represents 50% of students' grades. Pedagogical knowledge is ascertained primarily from readings, assignments and participation in the course, and represents 50% of students' grades. Therefore students who demonstrate excellence in both pedagogical knowledge and content knowledge receive grades of A.

At George Mason University course work is measured in terms of quantity and quality. A credit normally represents one hour per week of lecture or recitation or not fewer than two hours per week of laboratory work throughout a semester. The number of credits is a measure of quantity. The grade is a measure of quality. The university-wide system for grading graduate courses is as follows:

| Grade | GRADING | Grade Points | Interpretation  |
|-------|---------|--------------|---|
| A     | 94-100  | 4.00         | Represents mastery of the subject through effort beyond basic requirements. |
| A-    | 90-93   | 3.67         |   |
| B+    | 85-89   | 3.33         |   |

|           |       |      |  |
|-----------|-------|------|--|
| <b>B</b>  | 80-84 | 3.00 | Reflects an understanding of and the ability to apply theories and principles at a basic level     |
| <b>C*</b> | 70-79 | 2.00 | Denotes an unacceptable level of understanding and application of the basic elements of the course |
| <b>F*</b> | <69   | 0.00 |  |

Note: "C" is not satisfactory for a licensure course.

"F" does not meet requirements of the Graduate School of Education

#### 4. Other expectations

- a. **Attendance:** It is your responsibility to attend all class sessions. You are held accountable for all information from each class session whether you are present or not. Reasons for any absence must be reported to the instructor in writing.
- b. **Tardiness:** It is your responsibility to be on time for each class session. Reasons for any absence must be reported to the instructor in writing.

#### Emergency Procedures

You are encouraged to sign up for emergency alerts by visiting the website <https://alert.gmu.edu>. There are emergency posters 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>

Important information needed for successful completion of licensure:

### IMPORTANT INFORMATION FOR LICENSURE COMPLETION

#### Student Clinical Practice: Internship Requirements

##### Testing

Beginning with Spring 2015 internships, **all** official and passing test scores must be submitted and in the Mason system (i.e. Banner/PatriotWeb) by the internship application deadline. Allow a minimum of six weeks for official test scores to arrive at Mason. Testing too close to the application deadline means scores will not arrive in time and the internship application will not be accepted.

##### Required tests:

Praxis Core Academic Skills for Educators Tests (or qualifying substitute)  
VCLA  
Praxis II (Content Knowledge exam in your specific endorsement area)



For details, please check <http://cehd.gmu.edu/teacher/test/>

### **Endorsements**

Please note that ALL endorsement coursework must be completed, with all transcripts submitted and approved by the CEHD Endorsement Office, prior to the internship application deadline. Since the internship application must be submitted in the semester prior to the actual internship, please make an appointment to meet with the Endorsement Specialist and plan the completion of your Endorsements accordingly.

### **Background Checks/Fingerprints**

All local school systems require students to complete a criminal background check through their human resources office (not through George Mason University) **prior to beginning field hours and internship**. Detailed instructions on the process will be sent to the student from either the school system or Mason. Students are **strongly advised** to disclose any/all legal incidents that may appear on their records. The consequence of failing to do so, whether or not such incidents resulted in conviction, is termination of the field hours or internship.

### **Please Note**

Your G-Number must be clearly noted (visible and legible) on the face of the document(s) that you submit.

### **Application**

The internship application can be downloaded at <http://cehd.gmu.edu/teacher/internships-field-experience>

### **Deadlines**

Spring internship application:

Traditional: September 15

Fall internship application:

Traditional: February 15

Year Long Internship: April 1 (All testing deadlines are August 1 immediately preceding the fall start; RVE deadline is December 1)

## **CPR/AED/First Aid**

Beginning with spring 2015 internships, verification that the Emergency First Aid, CPR, and Use of AED Certification or Training requirement must be submitted and in the Mason system (i.e. Banner/PatriotWeb) by the application deadline. Students must submit one of the "acceptable evidence" documents listed at <http://cehd.gmu.edu/teacher/emergency-first-aid> to CEHD Student and Academic Affairs. In order to have the requirement reflected as met in the Mason system, documents can be scanned/e-mailed to [CEHDacad@gmu.edu](mailto:CEHDacad@gmu.edu) or dropped-off in Thompson Hall, Suite 2300.

### **TK20 PERFORMANCE-BASED ASSESSMENT SUBMISSION REQUIREMENT**

Every student registered for any Elementary Education course with a required performance-based assessment is required to submit this assessment, Individual Student Assessment (Clinical Interview) to Tk20 through Blackboard (regardless of whether the student is taking the course as an elective, a onetime course or as part of an undergraduate minor). Evaluation of the performance-based assessment by the course instructor will also be completed in Tk20 through Blackboard. Failure to submit the assessment to Tk20 (through 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 Tk20 submission, the IN will convert to an F nine weeks into the following semester.”

### **GMU POLICIES AND RESOURCES FOR STUDENTS**

- a. Students must adhere to the guidelines of the George Mason University Honor Code (See <http://oai.gmu.edu/the-mason-honor-code/>).
- b. Students must follow the university policy for Responsible Use of Computing (See <http://universitypolicy.gmu.edu/policies/responsible-use-of-computing/>).
- c. Students are responsible for the content of university communications sent to their George Mason University email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students solely through their Mason email account.
- d. The George Mason University Counseling and Psychological Services (CAPS) staff consists of professional counseling and clinical psychologists, social workers, and counselors who offer a wide range of services (e.g., individual and group counseling, workshops and outreach programs) to enhance students' personal experience and academic performance (See <http://caps.gmu.edu/>).

- e. Students with disabilities who seek accommodations in a course must be registered with George Mason University Disability Services and inform their instructor, in writing, as soon as possible. Approved accommodations will begin at the time the written letter from Disability Services is received by the instructor (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:**

| Date                          | Topic   | Readings Due  | Assignments Due   |
|-------------------------------|---|---|---|
| <p><b>1/25</b><br/>Week 1</p> | <p>How Do Children Learn Mathematics?<br/>5 Practices<br/>NCTM Principles &amp; Standards<br/>Overview of Overall Richness of Mathematics (MQI)<br/>Sign Up: Group Problem Based Lesson</p> |   | <p><b>Blackboard Reflection:</b><br/>Math<br/>Autobiography</p>   |
| <p><b>2/1</b><br/>Week 2</p>  | <p>Teaching Through Problem Solving<br/>Lesson Planning</p>   | <p><b>Van de Walle</b><br/>Chapter 3 &amp; Chapter 4</p> <p><b>Other</b><br/>Orchestrating Productive Discussions Article (Blackboard)<br/>MQI: Linking Representations p. 5 (Blackboard)</p> <p><b>Look For:</b> A big idea to share</p> | <p><b>PBA</b><br/>Identify Child</p>  |
| <p><b>2/8</b><br/>Week 3</p>  | <p>Cognitive Demand<br/>Selecting, Sequencing &amp; Connecting</p>  | <p><b>Other</b><br/>MQI: Multiple Procedures/Solutions p. 8 (Blackboard)</p>  | <p><b>PBA Identify Child</b><br/><b>Blackboard Assignment</b><br/><b>Selecting &amp; Sequencing Practice</b></p>                            |
| <p><b>2/15</b><br/>Week 4</p> | <p>Creating Assessments for Learning<br/><br/>Developing Early Number Concepts and Number Sense</p>   | <p><b>Van de Walle</b><br/>Chapters 5 &amp; 8</p> <p><b>Look For:</b><br/>A question you have</p>   | <p><b>PBA</b><br/>Identify SOL and bring related Curriculum Framework document.<br/>Brainstorm representations and manipulatives</p>        |
| <p><b>2/22</b><br/>Week 5</p> | <p>Developing Basic Fact Fluency<br/><br/>Developing Whole-Number and Place Value Concepts<br/><br/><b>Problem-Based Lesson Presentation: Group #1</b></p>                                  | <p><b>Van de Walle</b><br/>Chapter 10<br/>Chapter 11</p> <p><b>Other</b><br/>MQI: Explanations p. 6 (Blackboard)</p> <p><b>Look For:</b><br/>Something different from how you learned</p>   | <p><b>PBA</b><br/>Look at Van de Walle chapter to identify possible tasks<br/>Create a draft of your plan &amp; add follow up questions</p> |

|                                |   |   |   |
|--------------------------------|---|---|---|
| <p><b>2/29</b><br/>Week 6</p>  | <p>Developing Student Strategies for Addition and Subtraction</p> <p><b>Problem-Based Lesson Presentation: Group #2</b></p>       | <p><b>Van de Walle</b><br/>Chapter 9<br/>Chapter 12</p> <p><b>Other</b><br/>MQI: Sense Making p. 7 (Blackboard)</p> <p><b>Look For:</b><br/>A new strategy</p>                                  | <p><b>PBA</b><br/>DRAFT PBA Plan Due<br/>(Bring copy to class)</p> <p><b>Problem-Based Lesson Write-Up Due: Group #1</b></p>          |
| <p><b>3/7</b></p>              | <p><b>Spring Break - No Class</b></p>   |   |   |
| <p><b>3/14</b><br/>Week 7</p>  | <p>Developing Student Strategies for Multiplication and Division</p> <p><b>Problem-Based Lesson Presentation: Group #3</b></p>    | <p><b>Van de Walle</b><br/>Chapter 13</p> <p><b>Other</b><br/>MQI: Patterns and Generalizations p. 10 (Blackboard)</p> <p><b>Look For:</b> A strategy that does not mesh with your thinking</p> | <p><b>PBA</b><br/>Interview Child</p> <p><b>Problem-Based Lesson Write-Up Due: Group #2</b></p>                                       |
| <p><b>3/21</b><br/>Week 8</p>  | <p>Fraction Concepts</p> <p><b>Problem-Based Lesson Presentation: Group #4</b></p>  | <p><b>Van de Walle</b> Chapter 15</p> <p><b>Other</b><br/>MQI: Math Language p. 11 (Blackboard)</p> <p><b>Look For:</b> Something you don't understand</p>                                      | <p><b>PBA</b> Transcribe key conversation pieces</p> <p><b>Problem-Based Lesson Write-Up Due: Group #3</b></p>                        |
| <p><b>3/28</b><br/>Week 9</p>  | <p>Fraction Operations Review Overall Richness of Mathematics (MQI)</p> <p><b>Problem-Based Lesson Presentation: Group #5</b></p> | <p><b>Van de Walle</b><br/>Chapter 16</p> <p><b>Look For:</b><br/>Something you have seen at your school</p>  | <p><b>PBA</b><br/>Bring draft to share with peer</p> <p><b>Problem-Based Lesson Write-Up Due: Group #4</b></p>                        |
| <p><b>4/4</b><br/>Week 10</p>  | <p>Decimals &amp; Percent<br/>Probability</p>   | <p><b>Van de Walle</b><br/>Chapter 17<br/>Chapter 22</p> <p><b>Look For:</b><br/>Something you struggle with</p>  | <p><b>Problem-Based Lesson Write-Up Due: Group #5</b></p>   |
| <p><b>4/11</b><br/>Week 11</p> | <p>Online Class<br/>Proportional Reasoning</p> <p><b>Selecting and Sequencing Assignment Due</b></p>                              | <p><b>Van de Walle</b><br/>Chapter 18</p> <p><b>Look For:</b><br/>Something that intrigues you</p>  | <p><b>PBA Due:</b> Initial Due Date</p> <p><b>Mathematics Curriculum and Assessment Analysis (Illustrations/VD OE Lesson) Due</b></p> |

|                                |  |   |  |
|--------------------------------|--|---|--|
| <p><b>4/18</b><br/>Week 12</p> | <p>Algebraic Thinking &amp; Data Analysis</p>                              | <p><b>Van de Walle</b><br/>Chapter 14<br/>Chapter 21</p> <p><b>Look For:</b><br/>Something that surprises you</p> |  |
| <p><b>4/25</b><br/>Week 13</p> | <p>Measurement<br/>Area/Perimeter and the Math Workshop</p>                | <p><b>Van de Walle</b><br/>Chapter 19</p> <p><b>Look For:</b><br/>An activity to share</p>                        | <p><b>PBA Due:</b> Final Turn-In Date</p>                  |
| <p><b>5/2</b><br/>Week 14</p>  | <p>Geometry<br/>Independent Planning</p>                                   | <p><b>Van de Walle</b><br/>Chapter 20</p> <p><b>Look For:</b><br/>The most important thing</p>                    | <p><b>Individual Problem-Based Lesson Write-Up Due</b></p> |
| <p><b>5/9</b><br/>Week 15</p>  | <p>Sharing Our Work: PBA<br/>Reflecting on Our Learning<br/>Math Panel</p> |   |  |

## **ASSESSMENT RUBRIC(S):**

### **Teacher Candidate Instruction and Assessment Plan**

#### **Assessment Objective**

- The candidate will use knowledge of individual learning differences and assessment to develop an instructional plan for a student with developmental, learning, physical or linguistic differences, including a plan for assessing the student's progress.

#### **Rationale**

Lesson planning is an essential skill for an educator. A lesson plan is a road map for instruction. When planning teachers and teacher candidates need to answer four main questions:

Who are my students? (Context/Student Needs)

What do my students need to know and be able to do? (Objectives)

How will I get all students to know and do the new tasks? (Teaching and learning)

How will I know they know what was taught? (Assessments)

The first step in planning is identifying the learning objectives for the lesson based upon student abilities, challenges, and prior knowledge. Before developing specific learning activities, determine how you will assess if students have met the lesson objectives. Once you know how you will assess student learning, you can develop activities that align instruction with the assessment. Additionally, a teacher must consider student prior knowledge, how to differentiate to meet student needs, and how to do so within the time allotted. Lesson plans include pacing, transitions, checking for understanding, and ideas for re-teaching or extending learning based upon student needs.

The planning process is the same whether you are planning a lesson for a class or for an individual. For this assessment you will develop an instructional plan for a student with developmental, learning, physical or linguistic differences, including a plan for assessing the student's progress.

#### **Assessment Task Directions**

Candidates will develop an individualized plan for a child with developmental, learning, physical, or linguistic differences within the context of the general environment and curriculum that includes the following sections:

**Section 1. Description of the individual student** that includes **cognitive, linguistic, social, emotional, and/or physical** developmental skill levels and abilities, interests **and** educational progress and **statement of educational need**. (1 page or less)

**Section 2. Identification of and rationale for three learning objectives** that support meaningful learning outcomes for the student. (1 page or less)

- Each of the learning objectives should connect to one specific mathematics concept (i.e. patterns, sorting, addition of whole numbers, division of fractions). Tell why this concept is appropriate for this child at this particular grade level.

**Section 3. Description of and rationale for at least three evidence-based instructional strategies** that address the identified learning objectives and reflect the student's **cognitive, linguistic, social, emotional, and/or physical** developmental skill levels and abilities, interests **and** educational needs. (2 pages or less)

- Plan for teaching and assessing levels of mathematics competencies -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.

**Section 4. Description of and rationale for instructional adaptations** and accommodations needed, including the use of augmentative and alternative communication systems and assistive technologies or other appropriate technologies. (3 pages or less)

- Task and Questions for differentiation -Collect and document three different forms of representation (concrete, pictorial, abstract symbols) during the assessment to elicit the child's level of understanding. The report must include samples of the child's computations, writings and drawings, as well as a description of how the child used concrete objects during the assessment or photographs of the child's work.

**Section 5. Statement of plan for the assessment and documentation** of the student's progress toward the identified objectives. (3 pages or less)

- Evaluation & Instructional plan with Work Samples and Excerpts-Your assessment of the child's thinking should give you some information for planning instruction. Your suggestions should be based on what you learned about the child during the assessment. Many general suggestions can be valuable for children. However, your recommendations should relate to specifics. For example, if you assessed basic division concepts and you suggest that the instructional plan for the child should include more manipulatives, that would be an important teaching strategy, but it would be too general. You should be more specific about why and how manipulatives might be used. Example: "The student had difficulty making 3 equal groups from a set of 21 chips; therefore, the student should be given more experiences with grouping and partitioning manipulatives in sets of 15 to 30 to develop both the measurement and partitive concepts of division."



**Section 6:** Reflection: The candidate uses ongoing analysis and reflection to improve planning and practice.

- Candidate reflects on the assessment process. How long did the assessment last? What did you learn about assessment techniques? What did you learn about your ability to create mathematics questions and tasks for this concept? If you were to conduct the assessment with another child, would there be any changes in your questions, either the order or the level of difficulty, or the materials you had available for the child to use? Why or why not? What have you learned about how children learn mathematics from this assessment? How might a classroom teacher use the diagnostic mathematics assessment to assess children?

Teacher Candidate Instruction and Assessment Plan

Rubric

| Criteria   | Does Not Meet Standard 1   | Approaches Standard 2  | Meets Standard 3  | Exceeds Standard 4  |
|--|--|--|---|---|
| <b>Section 1</b>   |  |  |   |   |
| <b>Description of Individual Student</b>   |  |  |   |   |
| <p><b>The candidate regularly assesses individual and group performance in order to design and modify instruction to meet learners' needs in each area of development (cognitive, linguistic, social, emotional, and physical) and scaffolds the next level of development.</b></p> <p><i>InTASC 1(a)</i><br/><i>ACEI 1.0</i><br/><i>CAEP 1a</i></p> | <p>The candidate does not provide a description or the description of student <b>does not</b> include assessment data <b>related to cognitive, linguistic, social, emotional, and/or physical</b> developmental skill levels and abilities, interests, <b>or</b> educational progress.</p> | <p>The candidate provides description of student that includes appropriate assessment data related to <b>some but not all</b> of the following: cognitive, linguistic, social, emotional, and/or physical developmental skill levels and abilities, interests, <b>or</b> educational progress.</p> | <p>The candidate provides description of student that includes appropriate assessment data on <b>all</b> of the following: cognitive, linguistic, social, emotional, and/or physical developmental skill levels and abilities, interests, and educational progress.</p> <p>The candidate describes impact of student characteristics on learning.</p> | <p>The candidate provides description of student that includes both appropriate and multiple forms of assessment data on <b>all</b> of the following: cognitive, linguistic, social, emotional, and/or physical developmental skill levels and abilities, interests, and educational learning need.</p> <p>The candidate describes <b>and</b> provides examples of impact of student characteristics on learning.</p> |
| <b>Statement of Educational Need</b>   |  |  |   |   |
| <p><b>The candidate effectively uses multiple and</b></p>  | <p>The candidate <b>does not</b> address student</p>   | <p>The candidate uses assessment data to create a</p>  | <p>The candidate uses assessment data to create an</p>  | <p>The candidate <b>effectively</b> uses assessment data</p>  |

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| <p>appropriate types of assessment data to identify each student's learning needs and to develop differentiated learning experiences.</p> <p><i>InTASC 6(g)</i><br/><i>ACEI 4.0</i><br/><i>CAEP 3a</i></p> | <p>educational needs or <b>inappropriately uses</b> assessment data to create a statement of educational need.</p> | <p>statement of educational need that is <b>marginally</b> aligned with assessment results.</p> | <p><b>appropriate</b> statement of educational need that is <b>aligned</b> with assessment results.</p> | <p>from <b>multiple sources</b> to create a <b>thorough and appropriate</b> statement of educational need that is <b>aligned</b> with assessment results.</p> |
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**Section 2**  
**Identification of Learning Objectives**

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| <p>The candidate <b>effectively uses multiple representations and explanations that capture key ideas in the discipline, guide learners through learning progressions, and promote each learner's achievement of content standards</b></p> <p><i>InTASC 7(a)</i><br/><i>ACEI 2.3</i><br/><i>CAEP 2b</i></p> | <p>The candidate identifies learning objectives that are <b>either</b> (a) <b>incomplete</b> because related outcomes are not identified <b>or</b> (b) the objectives are <b>not directly related</b> to student educational need.</p> | <p>The candidate identifies learning objectives <b>without relevance</b> to student educational need.</p> | <p>The candidate identifies learning objectives with related outcomes that are <b>relevant</b> to individual student needs.</p> | <p>The candidate identifies <b>distinct</b> learning objectives with related outcomes that are <b>relevant</b> to individual student needs. Effectively uses multiple representations and explanations that capture key ideas in the discipline, guide learners through learning progressions, and promote each learner's achievement of content standards.</p> |
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**Identification of Rationale for Learning Objectives**

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| <p>The candidate <b>plans for instruction based on</b></p> | <p>The candidate <b>does not provide</b> rationales which</p> | <p>The rationales provided <b>are not</b> be aligned to the specific</p> | <p>The rationales provided <b>are aligned</b> with the learning</p> | <p>The rationales provided <b>are aligned</b> with the learning</p> |
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| <p><b>formative and summative assessment data, prior learner knowledge, and learner interest.</b></p> <p><i>InTASC 7(d)</i><br/><i>ACEI 1.0</i><br/><i>CAEP 3a</i></p> | <p>are aligned to the specific learning objectives and/or the relationship of the learning objectives to student educational needs is <b>missing or unclear.</b></p> | <p>learning objective and the relationship of the learning objectives to student educational needs is <b>unclear.</b></p> | <p>objective and the relationship of learning objectives to student educational needs is <b>clearly</b> identified.</p> | <p>objective and the relationship of the learning objectives to student educational needs is <b>clearly and effectively</b> identified.</p> |
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**Section 3**  
**Description of Instructional Strategies**

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| <p>The candidate plans how to achieve each student's learning goals, choosing appropriate strategies and accommodations, resources, and materials to differentiate instruction for individuals and groups of learners.</p> <p><i>InTASC 7b</i><br/><i>ACEI 2.3</i><br/><i>CAEP 2b</i></p> | <p>The candidate <b>does not</b> identify instructional strategies or identifies instructional strategies that are <b>not related</b> to the learning objectives <b>or</b> student learning needs.</p> | <p>The candidate identifies instructional strategies that are <b>marginally</b> related to the learning objectives <b>or</b> student learning needs.</p> | <p>The candidate identifies <b>evidence-based</b> instructional strategies that are aligned to the learning objectives and student learning needs.</p> | <p>The candidate identifies <b>evidence-based</b> instructional strategies that are aligned to <b>specific</b> learning objectives and student learning needs.</p> <p>The candidate provides <b>specific sources of</b> evidence for the instructional strategy.</p> |
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**Rationale for Instructional Strategies**

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| <p>The candidate understands that each learner's cognitive, linguistic, social, emotional, and physical development influences learning and knows how to</p> | <p>The candidate <b>does not provide</b> rationales which are aligned to the specific instructional strategies <b>and/or</b> the relationship of</p> | <p>The rationales provided <b>do not</b> aligned to the specific instructional strategies and, the relationship of the instructional strategies to the</p> | <p>The rationales provided <b>are aligned</b> with instructional strategies and, the relationship of the instructional strategies to the learning</p> | <p>The rationales provided <b>are aligned</b> with the strategies and, the relationship of the instructional strategies to <b>specific</b> learning objectives that</p> |
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| <p>make instructional decisions that build on learners' strengths and needs.</p> <p><i>InTASC 1(e)</i><br/><i>ACEI 3.1</i><br/><i>CAEP 3</i></p> | <p>instructional strategies to the learning objectives and student educational needs is <b>missing or unclear</b>.</p> | <p>learning objectives that meet student educational needs is <b>unclear</b>.</p> | <p>objectives that meet student educational needs is <b>clearly</b> identified.</p> | <p>meet student educational needs is <b>clearly and effectively</b> identified.</p> |
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**Section 4**  
**Description of Instructional Adaptation**

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| <p>The candidate accesses resources, supports, and specialized assistance and services to meet particular learning differences or needs.</p> <p><i>InTASC 2(f)</i><br/><i>ACEI 3.1</i><br/><i>CAEP 3a</i></p> | <p>The candidate <b>does not identify</b> either adaptations or accommodations to support student achievement of learning objectives.</p> | <p>The candidate identifies <b>either</b> adaptations or accommodations that <b>minimally support</b> student achievement of learning objectives.</p> | <p>The candidate identifies and describes appropriate adaptations or accommodations that <b>clearly support</b> student achievement of learning objectives.</p> | <p>The candidate identifies and thoroughly describes appropriate adaptations or accommodations that <b>clearly support</b> student achievement of learning objectives.</p> |
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**Rationale for Instructional Adaptation**

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| <p>The candidate knows a range of evidence-based instructional strategies, resources, and technological tools and how to use them effectively to plan instruction that meets diverse learning needs.</p> | <p>The candidate <b>does not provide</b> rationales that are aligned to the adaptations and accommodations <b>and/or</b> the relationship of the adaptations and</p> | <p>The rationales <b>marginally provides</b> evidence to support the adaptations and accommodations and the relationship of the adaptations and accommodation</p> | <p>The rationales provide <b>adequate</b> evidence to support the adaptations and accommodations and the relationship of the adaptations and accommodations</p> | <p>The rationales provide <b>evidence-based support</b> for the specific adaptations and accommodations and the relationship of the adaptations and accommodations</p> |
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| <p><i>InTASC 7(k)</i><br/><i>ACEI 2.3</i><br/><i>CAEP 3c</i></p> | <p>s to student educational needs is <b>missing or unclear</b>.</p> | <p>s to student educational needs is <b>unclear</b>.</p> | <p>to student educational needs is <b>clearly identified</b>.</p> | <p>to student educational needs is <b>clearly and thoroughly</b> identified.</p> |
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**Section 5 Assessment and Documentation of Student Progress**

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| <p><b>The candidate designs assessments that match learning objectives with assessment methods balances the use of formative and summative assessment as appropriate to support, verify, and document learning.</b></p> <p><i>InTASC 6b</i><br/><i>ACEI 3.1</i><br/><i>CAEP 3a</i></p> | <p>The candidate <b>does not</b> describe an assessment plan that that evaluates all student learning objectives <b>or</b> describes a plan that <b>does not</b> directly measure all of the student learning objectives (e.g., is <b>not observable, measurable</b>).</p> <p>The transcript shows that during the assessment, the teacher used no probing and follow-up questions when a specific follow-up question would have been appropriate.</p> | <p>The candidate describes an assessment plan that evaluates all student learning objectives but <b>does not</b> include documentation of <b>both</b> formative and summative measures that <b>does not</b> address possible assessment bias.</p> <p>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.</p> | <p>The candidate describes an assessment plan that evaluates all student learning objectives <b>and includes both</b> formative and summative assessments that minimize sources of bias.</p> <p>The candidate describes the assessment results that would prompt modification of instructional plans <b>and</b> those specific modifications.</p> <p>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.</p> | <p>The candidate describes an assessment plan that evaluates <b>all</b> student learning objectives, <b>includes</b> formative and summative assessments that minimize sources of bias and includes <b>multiple</b> data sources for each objective.</p> <p>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</p> |
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|   |  |  |  | probe for understanding.  |
| <b>Section 6: (addition) Reflection</b>   |  |  |  |   |
| <p><b>The candidate uses ongoing analysis and reflection to improve planning and practice.</b></p> <p><i>InTASC 9(l)</i><br/><i>ACEI 5.1</i><br/><i>CAEP 5c</i></p> | <p>There was <b>no evidence</b> that the candidate used ongoing analysis and/or reflection to improve planning and practice.</p> | <p>The candidate <b>uses marginal analysis and reflection strategies</b> to improve planning and practice.</p> | <p>The candidate uses <b>ongoing analysis and reflection</b> to improve planning and practice.</p> | <p>The candidate <b>effectively uses ongoing analysis and deep reflection</b> to improve planning and practice.</p> |