

**George Mason University
College of Education and Human Development
Elementary Education Program**

ELED 552-001 - Mathematics Methods for the Elementary Classroom
3 Credits, Spring 2020
THURS 4:30 pm - 7:10 pm
Thompson Hall 2020
Fairfax Campus

Faculty

Name: Dr. Jennifer Suh
Office Hours: By Appointment
Office Location: 2401 Thompson Hall
Office Phone: 703-993 9119
Email Address: jsuh4@gmu.edu

Prerequisites/Corequisites

Admission to the elementary education licensure program.

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.

Course Overview

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.

Doing Mathematics (Learning *for* practice): We will build our own *knowledge* of mathematics by closely investigating ideas in number sense and fraction concepts. Additionally, we will engage in several math tasks, extending our knowledge of mathematics and students' thinking, which will provide the foundation for your professional decision-making.

Examining Records of Practice (Learning *from* practice): Records of practice—such as videotapes of lessons taught by yourself or others, students' work, and teachers' professional writing—allow us to investigate the work of teaching mathematics and improve our own practice.

Trying Things Out (Learning *in* practice): Because teaching involves more than just having knowledge, we want you to engage in *enacting* the practices we are investigating as much as possible, so that you are developing the skills and professional decision-making that will make you a successful teacher.

Course Delivery Method

This course will be delivered using a lecture format.

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 do the following:

- 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 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.
- G. Understand the multiple representations of mathematical concepts and procedures.
- H. Understand and use the five processes—reasoning mathematically, solving problems, communicating mathematics effectively, making mathematical connections, and using mathematical representations—at different levels of complexity
- I. Explore the contributions of different cultures toward the development of mathematics, and the role of mathematics in culture and society.
- J. Understand the relationship of math to science, the design process, and technology.
- K. Understand, possess, and integrate the knowledge, skills, dispositions, and processes needed to support learners’ achievement in an interdisciplinary manner in Virginia’s Foundation Blocks for Early Learning: Comprehensive Standards for Four-Year-Olds and the Virginia Standards of Learning in English, mathematics, history and social science, science, and computer technology.

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))

Upon completion of this course, students will have met the following professional standards:

Course Student Outcomes (above)	INTASC Standard (2013)
A Essential math	#4
B Planning and Teaching using manipulatives	#7
C Instructional Strategies	#8

D Assessing	#6
E Problem Solving	#5
F Learner Development and understanding of Learning Progression	#2/#1

Course & PBA	INTASC
552 Math Student Assessment Interview	#4 Content Knowledge #1 & #2 Learner Development & Differences #6 Assessment

Required Texts

Van De Walle, J., Karp, K. S., & Bay-Williams, J. M. (2018). *Elementary and Middle School Mathematics: Teaching Developmentally*. (10th edition) New York: Pearson(2019:9780134802084)

Course Performance Evaluation

Students are expected to submit all assignments on time in the manner outlined by the instructor (e.g., Blackboard)

- **Assignments and Examinations**

Math Blog, Participation and Professional Dispositions (20%)

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

Reading and activity reflections will be done via Math Blog entries. 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.

Video Vignettes Analysis using NCTM 8 Teaching Practices: (10%)

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

Being able to decompose a planned and enacted lesson for high quality of mathematics instruction is essential. This assignment will allow you to demonstrate your knowledge in determining of the essential components of a high-quality mathematics lesson. Students will be provided video vignettes to evaluate using the NCTM 8 Teaching Practices Observation Tool early in the semester and one after the implementation of their own lesson (Two vignettes)

Student Assessment Interview and Learning Progression Report: 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 within a conceptual learning trajectory, 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. Using the audio of the assessment and the student work describe the students' knowledge and situate his/her understanding within the conceptual learning progression/trajectory.

To guide your work, use this outline- This is editable but you must save a copy of one for yourself before editing :) Click link then go to FILE and click (Make a copy as...)

<https://docs.google.com/document/d/14Or7VMdkXf22wkT8NYPm7WZ171Ne4oGxmQwk1TUJcdI/edit?usp=sharing>

Lesson #1: Math Routine and Video Reflection with student work analysis (20%)

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

You are required to plan, teach, and complete a video reflection for a Math Routine taught to your classmates during the summer course, and to your students in your field assignment in the fall. Each 10-15 minute Math Routine will include the six essential elements of Math Routine and address a concept. A Math Routine lesson plan template will be provided, to which you will add your anticipated student responses and your expected series of questions.

- Group rehearsal for Math Routine (10%): The first Math Routine will be taught by a small group and presented to your classmates. Each group is expected to:
 - 1) prepare any materials needed for the Math Routine;

2) anticipate possible student responses to the problems presented and plan your expected sequence of follow-up questions; and 3) video record your group-led Math Routine and respond to your video in GoReact, according to the prompts in the detailed assignment description. The group will complete one video reflection on this teaching experience and submit one completed lesson plan. See rubric/Blackboard for more detail.

- Individual Math Routine (10%): Each individual will teach a whole class Math Routine appropriate to the grade level in your fall field placement. You will video record your individually-led Math Routine and respond to your video in GoReact, according to the prompts in the detailed assignment description. Each individual will complete a video reflection on this experience and submit a completed lesson plan. See rubric/Blackboard for more detail.

Lesson #2: Group Problem Lesson with Student work analysis (20%)

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

As a professional learning community group, you are required to plan, teach, and complete a formal summary for a 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 (MATH) 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 along the learning progression/trajectory and student work samples. The enacted lesson will be uploaded to Go react as a tool for reflection

- **Part A: Group Problem-Based Lesson Plan (VAULT) with rehearsal lesson (10%):** The first lesson will be taught by a small group and presented to your classmates as a simulated lesson. 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); The group will complete a written reflection on this experience on Goreact.
- **Part B: Individual Planned and Enacted Problem-Based Lesson Plan (10%):** After teaching the rehearsed 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 and collect and analyze student assessment. Each individual will complete a written reflection on this experience. **This lesson should be videotaped and annotated using the NCTM 8 Teaching Practices Observation Tool on GO REACT.** See rubric/Blackboard for more detail.

Addresses Learner Outcomes: C, D, E

Students will pick a lesson from vetted lesson resources such as NCTM online resource Illuminations or the VDOE, or other approved website that they will implement in a whole class setting of elementary students. **This lesson should be videotaped and annotated on GO REACT** Students will analyze their videos using the NCTM 8 Teaching Practices Observation Tool. Details for this assignment are on Blackboard.

- **Other Requirements**

- **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.
- **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.

Note: Faculty reserve the right to add, alter, or omit any assignment as necessary during the course of the semester. You will always receive advanced notice of any modifications.


- **Course Performance Evaluation 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.

All assignments are to be completed by the date listed in the syllabus. Written work will not be accepted after the due date unless prior arrangements have been made with the instructor

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).

Math Blog, Participation and Professional Dispositions (20%)  **Video Vignettes Analysis: (10%)**

Student Assessment Interview and Learning Progression Report: (30%)  **Lesson #1: Math Routine Lesson with student work analysis (3 act math modeling task) (20%)**

Lesson #2 : Problem Solving Lesson with student work analysis (20%)

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

Note: “C” is not satisfactory for a licensure course.

“F” does not meet requirements of the Graduate School of Education

Professional Dispositions

Students are expected to exhibit professional behaviors and dispositions at all times. (See Elementary Education Program Handbook).

Explore your Text- Textbook Walk Through

Section I: Teaching Mathematics: Foundations and Perspectives

1. Teaching Mathematics in the 21st Century
2. Exploring What It Means to Know and Do Mathematics
3. Teaching through Problem Solving
4. Planning in the Problem-Based Classroom
5. Creating Assessments for Learning
6. Teaching Mathematics Equitably to All Students

Section II: Development of Mathematical Concepts and Procedures

7. Developing Early Number Concepts and Number Sense
8. Developing Meanings for the Operations
9. Developing Basic Fact Fluency
10. Developing Whole-Number Place-Value Concepts
11. Developing Strategies for Addition and Subtraction Computation
12. Developing Strategies for Multiplication and Division Computation
13. Algebraic Thinking, Equations, and Functions
14. Developing Fraction Concepts
15. Developing Fraction Operations
16. Developing Decimal and Percent Concepts and Decimal Computation
17. Ratios, Proportions, and Proportional Reasoning
18. Developing Measurement Concepts
19. Geometric Thinking and Geometric Concepts
20. Developing Concepts of Data Analysis
21. Exploring Concepts of Probability
22. Developing Concepts of Exponents, Integers, and Real Numbers

Appendix A. Standards for Mathematical Practice A-1

Appendix B. NCTM Mathematics Teaching Practices: from Principles to Actions A-5

Appendix C. Guide to Blackline Masters A-7

Appendix D. Activities at a Glance A-13

HELPFUL WEBSITES

University of Washington Number Talks website: tedd.org

National Council of Teachers of Mathematics - Illuminations: illuminations.nctm.org

Jo Boaler's blog and resources: joboaler.com

Another Jo Boaler/Stanford University folks website w/K-12 math resources: youcubed.org

Number Talks and other Instructional Activities with videos and lesson plans: tedd.org

Estimation 180 (Andrew Stadel's site - elementary and MS focused): estimation180.com

Fawn Nguyen's website (MS Math focused): fawnnguyen.com

Dan Meyer's website (more HS focused): blog.mrmeyer.com

And his "3-Act" math lessons (MS and HS focused, linked to CCSS):

www.livebinders.com/play/play_or_edit?id=330579

Michael Pershan's blog, elementary school teacher: rationalexpressions.blogspot.com

CCSS Helpful Websites:

CCSS Progressions Documents: <http://ime.math.arizona.edu/progressions/>

Lots of lesson plans and videos organized by Standard: insidemathematics.org

CCSS aligned tasks: illustrativemathematics.org

CCSS aligned tasks and assessments: map.mathshell.org/

Eledl 552-001 - Mathematics Methods for the Elementary Classroom
Spring 2020

EDCI 552-001 - Mathematics Methods for the Elementary Classroom

Doing Mathematics (Learning *for* practice): We will build our own *knowledge* of mathematics by closely investigating ideas in number sense and fraction concepts. Additionally, we will engage in several math tasks, extending our knowledge of mathematics and students' thinking, which will provide the foundation for your professional decision-making.

Examining Records of Practice (Learning *from* practice): Records of practice—such as videotapes of lessons taught by yourself or others, students' work, and teachers' professional writing—allow us to investigate the work of teaching mathematics and improve our own practice.

Trying Things Out (Learning *in* practice): Because teaching involves more than just having knowledge, we want you to engage in *enacting* the practices we are investigating as much as possible, so that you are developing the skills and professional decision-making that will make you a successful teacher.

Assignment	Due Date
------------	----------

<p>Student Assessment Interview and Learning Progression Report: Course Performance Based Assessment (30points)</p> <p>(1) Design a plan for the assessment within a conceptual learning trajectory, 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. Using the audio of the assessment and the student work describe the students' knowledge and situate his/her understanding within the conceptual learning progression/trajectory.</p>	<p>Part 1 due Week 8 3/19</p> <p>Final report due Week 14 4/30 with presentation during last in-class.</p>
<p>Lesson #1: Math Routine lesson with student work analysis (20points) Addresses Learner Outcomes: A, B, C, D, E, F</p> <p>You are required to plan, teach, and complete a video reflection for a Math Routine taught to your classmates during the course and to your students in your field assignment in the fall. Each 15 minute Math Routine will include the essential elements of Math Routine and address a concept. A Math Routine lesson plan template will be provided, to which you will add your anticipated student responses and your expected series of questions. This will require you to implement many of the MTPs. You will videotape* your work with these students and then analyze the MTPs you implemented in the video and set goals for your final lesson assignment.</p>	<p>Final Lesson with Student work Analysis due Week 7 3/05</p>
<p>Lesson #2: Group Problem Lesson with student work analysis (20points)</p> <p>Part A: Group Problem-Based Lesson Plan with rehearsal lesson as scheduled in class Part B: Final Plan with Student work analysis : After teaching the rehearsed 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 and collect and analyze student assessment. Each individual will complete a written reflection on this experience. This lesson should be videotaped and annotated using the NCTM 8 Teaching Practices Observation Tool on GO REACT.</p>	<p>Final Lesson Student work Analysis Week 12 4/16</p>
<p>Math Blog, In-class Participation and Professional Dispositions (20points) Reflection of weekly readings and activities on BB as designed by instructor.</p>	<p>Weekly entries</p>
<p>Video Vignettes Analysis (10%) In lieu of two face to face class, teacher candidate will analyze two teaching vignettes using a structured observation tool aligned to NCTM 8 Teaching practices</p>	<p>Noted in syllabus on 2 Online meetings</p>

Details for these assignments are on Blackboard.

Class Schedule

Date	Topic	Readings Due	Assignments Due
<p>Week 1 1/23</p>	<p>How Do Children Learn Mathematics? 5 Practices for Math Discourse^{SEP} NCTM Principles & Standards^{SEP} Overview of <u>NCTM 8 Teaching Practices</u></p>	<p>Van de Walle: 1. Teaching Mathematics in the 21st Century</p>	

<p>Week 2 1/30</p>	<p>Teaching Through Problem Solving</p> <p>Math Routine: Three-Act Tasks</p>	<p>Van de Walle: 2. Exploring What It Means to Know and Do Mathematics 3. Teaching through Problem Solving</p>	
<p>Week 3 2/6</p> <p>Format Asynchronous</p>	<p>Creating Assessments for Learning: Selecting, Sequencing & Connecting</p> <p>Developing Early Number Concepts and Number Sense</p> <p>TEACHING PRACTICE 1. Establish Mathematics Goals to Focus Learning</p> <p>ONLINE CLASS Assignment: Video Vignette Activity #1 -</p> <p>Math Routine: Number Strings</p> <p>https://tedd.org/number-strings/</p> <p>https://tedd.org/three-act-tasks/ to learn about how to use the routine 3 act math. Use the resource attached and browse through a few math routines and choose one that you would use in your class. Highlight the SOL math concept it would address.</p>	<p>Van de Walle: 4. Planning in the Problem-Based Classroom</p> <p>5. Creating Assessments for Learning</p> <p>*PBA Check in: Identify Child</p>	<p>MR Video Vignette Analysis from Tedd.org (5point)</p>
<p>Week 4 2/13</p>	<p>Developing Early Number Concepts and Number Sense</p> <p>Developing Whole-Number and Place Value Concepts</p> <p>EQUITY</p>	<p>Van de Walle: ^{SEP}6. Teaching Mathematics Equitably to All Students</p> <p>7. Developing Early Number Concepts and Number Sense 8. Developing Meanings for the Operations</p> <p>Lesson #1: Math Routine Rehearsals</p> <p>*PBA Check in: Identify SOL and bring related Curriculum Framework document. Brainstorm representations and manipulatives</p>	

<p>Week 5 2/20</p>	<p>Developing Student Strategies for Addition & Subtraction</p> <p>TEACHING PRACTICE 2. Implement Tasks That Promote Reasoning and Problem Solving</p>	<p>Van de Walle: 9. Developing Basic Fact Fluency 10. Developing Whole-Number Place-Value Concepts</p> <p>*PBA Check in: Look at Van de Walle chapter to identify possible tasks</p> <p>Look at outside resources to identify possible tasks</p> <p>Lesson #1: Math Routine Rehearsals</p>	
<p>Week 6 2/27</p>	<p>Developing Student Strategies for Multiplication and Division</p> <p>TEACHING PRACTICE 3. Use and Connect Mathematical Representations</p>	<p>Van de Walle: 11. Developing Strategies for Addition and Subtraction Computation 12. Developing Strategies for Multiplication and Division Computation</p> <p>*PBA Check in: Start a draft of your some assessment tasks for your plan & add follow up questions</p> <p>Lesson #1: Math Routine Rehearsals</p>	
<p>Week 7 3/05</p>	<p>Learning Progression in Algebraic Thinking</p> <p>Penny Jar and More</p> <p>Math Routine: True and False Statement</p>	<p>Van de Walle: 13. Algebraic Thinking, Equations, and Functions</p> <p>*PBA Check in: Bring a hard copy of Interview Protocol to next class</p>	<p>Lesson #1: Math Routine Lesson with Student work analysis 20points</p>
<p>3/12</p>	<p>Enjoy GMU Spring Break</p>		
<p>Week 8 3/19</p>	<p>Fraction Concepts</p>	<p>Van de Walle: 14. Developing Fraction Concepts 15. Developing Fraction Operations</p>	<p>Part 1. Learning Progression Assessment Tasks with</p>

	TEACHING PRACTICE 4. Facilitate Meaningful Mathematical Discourse	Lesson #2: Problem Solving Lesson Rehearsals	Purposeful Questions DUE
Week 9 3/26	Fraction Operations and Decimal and Percents TEACHING PRACTICE 5. Pose Purposeful Questions Mathematics	Van de Walle: 16. Developing Decimal and Percent Concepts and Decimal Computation Lesson #2: Problem Solving Lesson Rehearsals	
Week 10 4/2 Asynchronous	Online class Discussion Board: Using the PTA practices to analyze teaching practices		Video Vignette Analysis (5pnts)
Week 11 4/9	Teacher Work day-online Analyze question types posed during interview assessment and second lesson.		
Week 12 4/16	Proportional Reasoning Measurement and Geometry TEACHING PRACTICE 6. Build Procedural Fluency from Conceptual Understanding	Van de Walle: 17. Ratios, Proportions, and Proportional Reasoning; 18. Developing Measurement	Lesson #2 : Problem Solving Lesson with Student work analysis (20points)
Week 13 4/23		Concepts 19. Geometric Thinking and Geometric Concepts	

	Area/Perimeter and the Math Workshop TEACHING PRACTICE 7. Support Productive Struggle in Learning		
Week 14 4/30	Developing Concepts of Data Analysis & Probability TEACHING PRACTICE 8. Elicit and Use Evidence of Student Thinking	Van de Walle: 20. Developing Concepts of Data Analysis: 21. Exploring Concepts of Probability	Student Assessment Interview and Learning Progression Report: 30 points
Week 15 5/7	Math Game Day Sharing Our Work: PBA Reflecting on Our Learning	Presentation of Student Assessment and Math Games around the world	

Note: Faculty reserves the right to alter the schedule as necessary, with notification to students.

Core Values Commitment

The College of Education and 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/>.

GMU Policies and Resources for Students

Policies

- Students must adhere to the guidelines of the Mason Honor Code (see <http://oai.gmu.edu/the-mason-honor-code/>).
- Students must follow the university policy for Responsible Use of Computing (see <http://universitypolicy.gmu.edu/policies/responsible-use-of-computing/>).
- Students are responsible for the content of university communications sent to their Mason 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 with disabilities who seek accommodations in a course must be registered with George Mason University Disability Services. Approved accommodations will begin at the time the written letter from Disability Services is received by the instructor (see <http://ods.gmu.edu/>).
- Students must follow the university policy stating that all sound emitting devices shall be silenced during class unless otherwise authorized by the instructor.

Campus Resources

- Support for submission of assignments to Tk20 should be directed to tk20help@gmu.edu or <https://cehd.gmu.edu/aero/tk20>. Questions or concerns regarding use of Blackboard should be directed to <http://coursessupport.gmu.edu/>.
- The Writing Center 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/>).
- The 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 Student Support & Advocacy Center staff helps students develop and maintain healthy lifestyles through confidential one-on-one support as well as through interactive programs and resources. Some of the topics they address are healthy relationships, stress management, nutrition, sexual assault, drug and alcohol use, and sexual health (see <http://ssac.gmu.edu/>). Students in need of these services may contact the office by phone at 703-993-3686. Concerned students, faculty and staff may also make a referral to express concern for the safety or well-being of a Mason student or the community by going to <http://ssac.gmu.edu/make-a-referral/>.
- For information on student support resources on campus, see <https://ctfe.gmu.edu/teaching/student-support-resources-on-campus>


Notice of mandatory reporting of sexual assault, interpersonal violence, and stalking: As a faculty member, I am designated as a “Responsible Employee,” and must report all disclosures of sexual assault, interpersonal violence, and stalking to Mason’s Title IX Coordinator per University Policy 1202. If you wish to speak with someone confidentially, please contact one of Mason’s confidential resources, such as Student Support and Advocacy Center (SSAC) at 703-380-1434 or Counseling and

Psychological Services (CAPS) at 703-993-2380. You may also seek assistance from Mason's Title IX Coordinator by calling 703-993-8730, or emailing titleix@gmu.edu.

For additional information on the College of Education and Human Development, please visit our website <https://cehd.gmu.edu/>.

Assessment Rubric(s)

INDIVIDUALIZED INSTRUCTION AND ASSESSMENT PLAN TASK

George Mason University College of Education and Human Development  Elementary Education Program

In the Elementary Education program, the Individualized Instruction and Assessment Plan Task is completed during EDCI 552 and is assessed by the instructor. The candidate must earn a score of 3 to be successful on this assignment. If a student does not earn a 3 on the assignment, they must meet with the course instructor or assessor prior to resubmitting. The data from this assessment are used to identify both best practice and identified gaps in developing and assessing a specific lesson plan to impact on individual learning.

STANDARDS

- **InTASC Standards:** 1, 2, 5, 6, 7, 8
- **CAEP Standards:** 1.1, 1.3, 1.4, 1.5
- **VDOE Standards:** 1, 2, 3, 4, 5

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.)

INTASC 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)

Standard #4: Content Knowledge. 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 the discipline accessible and meaningful for learners to assure mastery of the content.

Standard #5: Application of Content. 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

INTASC Standard #6 Assessment. 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

Standard #7: Planning for Instruction. 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.

Standard #9: Professional Learning and Ethical Practice. The teacher engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.

THEMES

-  Technology
-  Diversity
-  College & Career Ready

ASSESSMENT OBJECTIVES

- The candidate will use knowledge of individual learning differences and assessment to develop an instructional plan for a learner with developmental, learning, physical or linguistic differences.
- The candidate will develop an assessment of learner 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 learners? (Context/Learner Needs)
- What do the learners need to know and be able to do? (Objectives/Goals)
- How will I get all learners to know and do the new tasks? (Teaching and learning strategies)
- How will I know the learning objectives were achieved? (Goals/Outcomes/Assessments)

The first step in planning is aligning the learning objectives with the goals/outcomes/assessments for the lesson. This should include considerations based on learner abilities, challenges, and prior knowledge. Before developing specific learning activities, determine how you will assess if learners have met the lesson objectives. Once you know how you will assess learning, you can develop activities that align instruction with the assessment. Additionally, a teacher must consider learner prior knowledge, how to differentiate to meet learner 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 learner 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 learner with developmental, learning, physical or linguistic differences, including a plan for assessing the learner's progress.

ASSESSMENT 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. The individualized instruction and assessment plan should include the following sections:

Part 1. Learning Progression Assessment Tasks with Purposeful Questions

(Prepared in advance for the assessment -reviewed by instructor prior to scheduling assessment)

1a. Assessment tasks with multiple representations. Uses multiple and appropriate types of assessment tasks that uses multiple representations including pictorial, numeric, verbal and hands on manipulatives to assess student thinking and identify each learner's needs

1b. Purposeful questions. Designs assessment with tasks aligned with prepared questions that gathers information about student's interest, background and cultural information as well as specific questions linked to the tasks that probes thinking, and makes math visible.

1c. **Geared up and geared down with rationale on conceptual development.** Considers learner differences and has at least three (3) differentiated tasks geared up and down with one technology app-and to develop differentiated learning experiences.

Report written after assessment with student

Part 2. Description of the Learner (5-7pages) including evidence of student work as appendices with Video of Assessment on Goreact. The candidate includes description with multiple assessment results that would prompt modification of instructional plans.

2a. Description of the Learner as a whole child. Who is the learner? Seek out an individual who can provide you with a picture of who the individual is as a learner. Describe the individual include cognitive, linguistic, social, emotional, and/or physical developmental skill levels and abilities, interests, and educational progress and statement of educational need.

2b. Description of Assessment and Documentation of Learner Progress. Where the student is within the learning progression based on the assessment? Write a description of Assessment and Documentation of Learner ProgressThe candidate describes the student within the learning progression after the assessment. The candidate uses video and student work to analyze student within the learning progression by including multiple data sources for each objective.

2c. Documentation of student thinking evidenced by analysis of student work attached and clip of assessment on Goreact Specific references are made to the work and video clip about learner development using the text and progression document.

Part 3. Learning Goal and Instructional Activities (5-7 pages) . Based on the assessment and description of the learner, the teacher candidate sets learning goal and a set of activities that will advance the learner along the developmental learning trajectory.

3a. Learning Goal (aka: target, benchmark, expectation). What should they learn? Identify at least three learning objectives/goals with in the learning progression and develop a rationale that supports why the objectives/goals are meaningful learning outcomes. (Virginia Standards of Learning (SOLs), College-and-Career-Ready skills, and other content specific objectives should be included in lesson plans.)

3b. Set of activities matched to each of the levels of thinking in that path that help children develop the next higher level of thinking. How will you teach, and how will the individual learn? Describe at least three evidence-based instructional strategies that address the identified learning objectives/goals and reflect the learner’s developmental skill levels and abilities, interests and educational needs. Include the use of technologies used to address learning needs. Write a rationale for each showing how the strategies support learning and success for this learner.

3c. Developmental path along which children develop to reach that goal. Where is your student now and what are the next levels? Provide a rationale for instructional adaptations and accommodations needed. How will I know the learning objectives/goals were achieved? Write a plan for the assessment and documentation of the learner’s progress toward the identified objectives/goals.

Part 4. Reflection (1-2 pages)

How did the assessment help you understand the student's learning trajectory and where he or she is within the learning progression?

How long did the assessment last? What did you learn about assessment techniques? What did you learn about your ability to create mathematical 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 level of difficulty, or the materials you had available for the child to use? Why or why not?

Reflect on your use of questioning? Did you use a variety of questions (i.e. gathering, probing, making


math visible, reflecting & justifying questions)? What questions would you ask if you could do this assessment again?

What have you learned about how children learn mathematics from this assessment? How might a teacher use the diagnostic mathematics assessment to assess children?

REFERENCE

Spencer, J. (2003). *Learning and teaching in the clinical environment*. London, England: BMJ Publishing Group


INDIVIDUALIZED INSTRUCTION AND ASSESSMENT PLAN RUBRIC

George Mason University College of Education and Human Development  Elementary Education Program

In the Elementary Education program, the Individualized Instruction and Assessment Plan Task is completed during EDCI 552 and is assessed by the instructor. The candidate must earn a score of 3 to be successful on this assignment. If a student does not earn a 3 on the assignment, they must meet with the course instructor or assessor prior to resubmitting. The data from this assessment are used to identify both best practice and identified gaps in developing and assessing a specific lesson plan to impact on individual learning.


SCORING GUIDELINES

- **3 (Exemplary Standard):** Candidates receive a score of 3 if they perform at an exemplary level.. There is evidence that candidates have done additional research, identified additional resources, and/or demonstrate exceptional understanding and application of the standard.
- **2 (Meets Standard):** This score reflects that candidates have met the standard at the level expected at this point in their program. Candidates who receive a 2 have successfully met the standard.
- **1 (Approaches Standard):** Candidates receive this score when their understanding and effort does not meet the target but shows basic understanding of the content being assessed.
- **0 (Does Not Meet Standard):** Candidates who do not submit work, and/or who submit work that is clearly below the expectations for a candidate at this point in their program.

Performance	Does Not Meet  Standard (0)	Approaches Standard (1)	Meets Standard (2)	Exemplary Standard (3)
Part 1. Tasks and Questions with Learning Progression Considered				
Assessment tasks with multiple representations. Uses multiple and appropriate types of <u>assessment tasks that uses multiple representations</u> including pictorial, numeric, verbal and hands on manipulatives to assess student thinking and identify each learner’s needs (InTASC Standard #6 Assessment)	The candidate does not address learner educational needs or inappropriately uses assessment data to create a statement of educational need.	The candidate locates assessments that are not well aligned to the math concept.	The candidate locates assessments to create tasks aligned to the math concept but does not consider multiple representations.	The candidate effectively integrates assessment tasks from multiple sources to create a thorough and appropriate aligned to the learning progression. Assessment tasks that uses multiple representations including pictorial, numeric, verbal and hands on manipulatives to assess student thinking and identify the learner’s needs

<p>1b. Purposeful questions. Designs assessment with tasks aligned with <u>prepared questions</u> that gathers information about student's interest, background and cultural information as well as specific questions linked to the tasks that probes thinking, and makes math visible.</p>	<p>The candidate does not describe an assessment plan that evaluates all learning objectives or describes a plan with any questions.</p>	<p>The candidate describes an assessment plan that evaluates all learning objectives but does not include questions that delve into the child or concept.</p>	<p>The candidate describes an assessment plan that evaluates all learning objectives and includes questions linked to the tasks that probes thinking, and makes math visible but does not gather info about the whole child.</p>	<p>The candidate describes an assessment plan that evaluates all learning objectives and prepares a variety of questions to gather information about student's interest, background and cultural information as well as specific questions linked to the tasks that probes thinking, and makes math visible.</p>
<p>1c. Geared up and geared down with rationale on conceptual development. Considers learner differences and has <u>at least three (3) differentiated tasks geared up and down with one technology app-</u> and to develop differentiated learning experiences.</p> <p>(INTASC Standard #2: Learning Differences)</p>	<p>The candidate does not identify either adaptations or accommodations to support learner achievement of learning objectives.</p>	<p>The candidate identifies either adaptations or accommodations that do not fully align with identified needs.</p>	<p>The candidate identifies and describes appropriate adaptations or accommodations that support learner achievement of learning objectives/goals, including technology.</p>	<p>The candidate thoroughly describes multiple, appropriate adaptations or accommodations that clearly support learner achievement of learning objectives/goals, including technology.</p>

Part 2. DESCRIPTION OF THE LEARNER with ANALYSIS & DOCUMENTATION OF LEARNER WITHIN THE LEARNING PROGRESSION




<p>2a. Description of the Learner as a whole child. Who is the learner? Seek out an individual who can provide you with a picture of who the individual is as a learner. Describe the individual include cognitive, linguistic, social, emotional, and/or physical developmental skill levels and abilities, interests, and educational progress and statement of educational need.</p> <p>InTASC 1 & 2; VDOE 1;</p> 	<p>The candidate does not provide a description of the learner and/or does not include assessment data related to cognitive, linguistic, social, emotional, and/or physical and developmental skill levels and abilities, interests, or educational progress.</p>	<p>The candidate provides description of the learner that includes appropriate assessment data but does not address all of the following: cognitive, linguistic, social, emotional, and/or physical developmental skill levels and abilities, interests, or educational progress.</p>	<p>The candidate provides description of the learner that includes appropriate assessment data on all of the following: cognitive, linguistic, social, emotional, and/or physical developmental skill levels and abilities, interests, and educational progress. The candidate describes current impact of learner characteristics on learning.</p>	<p>The candidate provides description of the learner that includes both appropriate and multiple forms of assessment data on all of the following: cognitive, linguistic, social, emotional, and/or physical developmental skill levels and abilities, interests, and educational learning need.</p>
---	---	---	---	---

<p>2b. Description of Assessment and Documentation of Learner Progress. Where the student is within the learning progression based on the assessment? Write a description of Assessment and Documentation of Learner Progress. The candidate describes the student within the learning progression after the assessment. The candidate uses video and student work to analyze student within the learning progression by including multiple data sources for each objective.</p> <p>InTASC 2; VDOE 4</p>	<p>The candidate does not describe an assessment plan that evaluates all learning objectives or describes a plan that does not directly measure all of the learning objectives (e.g., is not observable, measurable).</p>	<p>The candidate describes an assessment plan that evaluates all learning objectives but does not include documentation of both formative and summative measures that (and) does not address possible assessment bias.</p>	<p>The candidate describes an assessment plan that evaluates all learning objectives and includes both formative and summative assessments that minimize sources of bias.</p> <p>The candidate describes the assessment results that would prompt modification of instructional plans and those specific modifications.</p>	<p>The candidate describes the student within the learning progression after the assessment. The candidate uses video and student work to analyze student within the learning progression by including multiple data sources for each objective.</p> <p>The candidate describes multiple assessment results that would prompt modification of instructional plans and those specific modifications.</p>
---	---	--	---	---

<p>2c. Documentation of student thinking evidenced by analysis of student work attached and clip of assessment on Goreact Specific references are made to the work and video clip about learner development using the text and progression document.</p> <p>InTASC Standard #6 Assessment.</p>	<p>The candidate does not provide rationales that are aligned to the specific instructional strategies and/or the relationship of instructional strategies to the learning objectives and learner educational needs is missing or unclear.</p>	<p>The rationales provided do not align to the specific instructional strategies and, the relationship of the instructional strategies to the learning objectives that meet learner educational needs is unclear.</p>	<p>The rationales provided are aligned to instructional strategies and, the relationship of the instructional strategies to the learning objectives that meet learner educational needs is clearly identified.</p>	<p>Documentation of student thinking evidenced by analysis of interview and student work. Specific references are made about learner development using the text an progression document.</p>
---	--	---	--	--

Part 3 Learning goals and Instructional Activities

<p>3a. Set Learning Goal (aka: target, benchmark, expectation) based on Developmental path along which children develop to reach that goal</p> <p>The candidate individually and collaboratively selects and creates learning objectives that are appropriate for curriculum goals and content standards, and are relevant to learners. The candidate identifies objectives for instruction based on formative and summative</p>	<p>The candidate identifies learning objectives that are either incomplete because related outcomes are not identified or the objectives are not directly related to</p>	<p>The candidate identifies learning objectives without relevance to learner educational need.</p>	<p>The candidate identifies learning objectives with related outcomes that are relevant to individual learner needs.</p>	<p>The candidate identifies distinct learning objectives with related outcomes that are relevant to individual learner needs. These learning outcomes allow for different and individualized learning pathways that can be accessed fluidly during instruction. Includes rationales for the</p>
---	--	--	--	---

<p>assessment data, prior learner knowledge, and learner interest.</p> <p>InTASC 7; VDOE 2</p> 	<p>learner educational need.</p>			<p>selection of those objectives and how they support the achievement in advancing student along the learning progression</p>
<p>3b. INSTRUCTIONAL STRATEGIES AND ADAPTATIONS-Set of activities matched to each of the levels of thinking in that path that help children develop the next higher level of thinking. The candidate plans how to achieve each learner’s learning goals, choosing appropriate strategies and accommodations, resources, and materials to differentiate instruction for individuals and groups of learners.</p> <p>InTASC 4</p>  <p>Standard #4: Content Knowledge.</p>	<p>The candidate does not identify instructional strategies or identifies instructional strategies that are not related to the learning objectives or learning needs.</p>	<p>The candidate identifies instructional strategies that are inappropriate for meeting the learning objectives or learning needs.</p>	<p>The candidate identifies evidence-based instructional strategies that are aligned to the learning objectives and learning needs.</p>	<p>The candidate identifies evidence-based instructional strategies that are aligned to specific learning objectives and learning needs.</p> <p>The candidate provides evidence of the effectiveness of these selected learning strategies through data analysis of the assessment.</p>
<p>3c. Developmental path along which children develop to reach that goalThe candidate connects concepts and uses different perspectives and digital resources to engage learners in critical thinking, creativity, and collaborative problem solving.</p> <p>InTASC 5; VDOE 2;</p> 	<p>Candidate does not connect concepts, address different perspectives or use digital resources to engage learners in higher-level learning.</p>	<p>Candidate connect concepts, addresses different perspectives or uses digital resources to engage learners but at a basic level of learning and recall.</p>	<p>Candidate connects concepts, addresses different perspectives and uses digital resources to engage learners in higher-level learning in using at least one of these higher-order skills: critical thinking, creativity, and collaborative problem solving.</p>	<p>Candidate creates multi-disciplinary opportunities and a range of multiple perspectives to engage learners in critical thinking, creativity, and collaborative problem solving.</p>
<p>REFLECTION and Presentation</p>				
<p>The candidate uses ongoing analysis and reflection to improve planning and practice</p>	<p>There was no evidence that the candidate used ongoing analysis and/or reflection to improve planning and practice.</p>	<p>The candidate uses marginal analysis and reflection strategies to improve planning and practice.</p>	<p>The candidate uses ongoing analysis and reflection to improve planning and practice</p>	<p>The candidate effectively uses ongoing analysis and deep reflection to improve planning and practice. Candidates reflects and shared on learning about the student’s learning trajectory.</p>

Lesson #1 :Math Routine Lesson with Student work analysis (20%) Students will pick a lesson from the Tedd.org math routine website, or other approved website that they will implement in a whole class setting of elementary students. This lesson should be videotaped and annotated on GO REACT Students will analyze their videos using the NCTM 8 Teaching Practices Observation Tool.

<ul style="list-style-type: none"> ● Part A: Design the lesson and have the problem and anticipated responses on Power Point slide and e-mail it to your instructor the Wednesday before class 	5 points
<ul style="list-style-type: none"> ● Part A:The group will complete one lesson plan with the 5 practices and highlight modification based on different grade levels or accomodations and reflect on the lesson on GReact. 	5 points
<ul style="list-style-type: none"> ● Part B:Complete a written reflection on this experience. Collect, reflect and analyze student assessment 	5 points
<ul style="list-style-type: none"> ● Part B: This lesson should be videotaped and annotated using the <u>NCTM 8 Teaching Practices Observation Tool</u> on GO REACT 	5 points
Total points	20/20

Lesson #2: Group Problem Lesson with Student Work Analysis (20%)

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

As a professional learning community group, you are required to plan, teach, and complete a formal summary for a 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 (MATH) 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 along the learning progression/trajectory and student work samples. The enacted lesson will be uploaded to Go react as a tool for reflection

- **Part A: Group Problem-Based Lesson Plan with rehearsal lesson (10points):** The first lesson will be taught by a small group and presented to your classmates as a simulated lesson. Each group is expected to: 1) design the lesson and have the problem and anticipated responses on Power Point slide and e-mail it to your instructor the Wednesday before class (5 points); 2) The group will complete one lesson plan with the 5 practices and highlight modification based on different grade levels or accomodations (5points).
- **Part B: Individual Planned and Enacted Problem-Based Lesson Plan (10points):** After teaching the rehearsed 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 and collect, reflect and analyze student assessment . Each individual will complete a written reflection on this experience(5points). This lesson should be videotaped and annotated using the NCTM 8 Teaching Practices Observation Tool on GO REACT (5points).

<ul style="list-style-type: none"> ● Part A: Design the lesson and have the problem and anticipated responses on Power Point slide and e-mail it to your instructor the Wednesday before class 	5 points
<ul style="list-style-type: none"> ● Part A:The group will complete one lesson plan with the 5 practices and highlight modification based on different grade levels or accomodations and reflect on the lesson on GOreact. 	5 points
<ul style="list-style-type: none"> ● Part B:Complete a written reflection on this experience. Collect, reflect and analyze student assessment 	5 points
<ul style="list-style-type: none"> ● Part B: This lesson should be videotaped and annotated using the <u>NCTM 8 Teaching Practices Observation Tool</u> on GO REACT 	5 points
Total points	20/20