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

ELED 552-002 – Mathematics Methods for the Elementary Classroom
3 Credits, Fall 2019
Friday 12:45 pm - 3:25 pm
Thompson Hall L019
Fairfax Campus

Faculty

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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.

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 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):**)**

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

Course Student Outcomes (above)	**INTASC Standard (2011)**	**ACEI**
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

INTASC Standard (2011)
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 these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.
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 #8: Instructional Strategies 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.
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 #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.
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 Student Assessment Interview	#4 Content Knowledge #1 & #2 Learner Development & Differences #6 Assessment	1.0 Development 2.3 Math 3.1 Planning Instruction 3.5 Communication 4.0 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, Tk20, hard copy).

- **Assignments and Examinations**

Participation in Math Blog, Participation and Professional Dispositions (20%)

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.

Video Vignette Analysis using Mathematics Quality of Instruction: (10%)

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

Being able to decompose a planned, enacted and assessed 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 MQI tool early in the semester and one after the implementation of their own lesson. https://cepr.harvard.edu/mqi

Student Assessment Interview and Education Plan:
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. Based upon feedback from the instructor on your plan, you may make modifications to the final plan and report. The PBA will be turned in via Tk20 on Blackboard, under Assessments.

Lesson #1 PLC Planned Problem-based Lesson Plans & Written Summaries (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 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. The enacted lesson will be uploaded to Go react as a tool for reflection

- **Part A: Group Problem-Based Lesson Plan 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); 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.
- **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 on GO REACT.** See rubric/Blackboard for more detail.

Lesson #2: Individually Planned PBL Lesson Analysis: (20%)

Addresses Learner Outcomes: C, D, E

The second individual will be uploaded to Go react as a tool for reflection. 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 Mathematical Quality of Instruction (MQI) framework https://cepr.harvard.edu/mqi . 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. 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. **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 in Math Blog, Participation and Professional Dispositions (20%)
Video Vignette Analysis using Mathematics Quality of Instruction: (10%)
Student Assessment Interview and Education Plan:(30%)
Lesson #1: Problem-Based Lesson Plan Summaries (20%)
Lesson #2 : Individually Planned PBL Lesson Analysis: Lesson #2 (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

TK20/Performance-Based Assessment(s) Submission Requirement

Every student registered for any Elementary Education course with a required TK20 performance-based assessment (designated as such in the syllabus) must submit this/these assessment(s) **(ELED 552: Student Assessment Interview)** to Tk20 through ***'Assessments'*** in Blackboard. Failure to submit the assessment(s) to

Tk20 (through Blackboard) will result in the course instructor reporting the course grade as Incomplete (IN). Unless this grade is changed upon completion of the required Tk20 submission, the IN will convert to an F nine weeks into the following semester.

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

Class Schedule

Date	Topic	Readings Due	Assignments Due
8/30 Week 1	How Do Children Learn Mathematics? 5 Practices NCTM Principles & Standards Overview of Overall Richness of Mathematics (MQI) Sign Up: Group Problem Based Lesson		
9/6 Week 2	Teaching Through Problem Solving Lesson Planning **Noticing Activity in lieu of class**	**Van de Walle:** 1. Teaching Mathematics in the 21st Century 2. Exploring What It Means to Know and Do Mathematics 3. Teaching through Problem Solving **Look For:** A big idea in mathematics to share	**Blackboard Reflection:** Math Autobiography ***PBA Check in:** Identify Child
9/13 Week 3	Creating Assessments for Learning: Selecting, Sequencing & Connecting Developing Early Number Concepts and Number Sense **ASSESSMENT**	**Van de Walle:** 4. Planning in the Problem-Based Classroom 5. Creating Assessments for Learning **Noticing article** **Look For:** A question you have	**Blackboard Assignment: Video Vignette Noticing Activity #1 Lesson Analysis** ***PBA Check in:** Identify SOL and bring related Curriculum Framework document. Brainstorm representations and manipulatives
9/20 Week 4	Developing Basic Fact Fluency Developing Whole-Number and Place Value Concepts	**Van de Walle:** 6. Teaching Mathematics Equitably to All Students 8. Developing Meanings for the Operations 9. Developing Basic Fact Fluency MQI:NOTICING	***PBA Check in:** Look at Van de Walle chapter to identify possible tasks

	EQUITY	**Look For:** What would you consider equitable teaching practices?	
9/27 Week 5	Developing Student Strategies for Addition Developing Student Strategies for Subtraction **Group Problem-Based Lesson 1**	**Van de Walle:** 10. Developing Whole-Number Place-Value Concepts 11. Developing Strategies for Addition and Subtraction Computation **Look For:** Curriculum Framework (Dr. Suh will provide link)	**Group Lesson 1: Part A-Plan Due: Simulated lesson start this week** ***PBA Check in:** Look at outside resources to identify possible tasks
10/4 Week 6	Developing Student Strategies for Multiplication and Division	**Van de Walle:** 12. Developing Strategies for Multiplication and Division Computation **Look For: A COMPUTATION STRATEGY that is new to you**	***PBA Check in:** Create a draft of your some assessment tasks for your plan & add follow up questions
10/11 Week 7	**Algebra** **Group Problem based Lesson Presentation 2**	**Van de Walle:** 13. Algebraic Thinking, Equations, and Functions MQI: Patterns and Generalizations p. 10 (Blackboard) **Look For:** A strategy that does not mesh with your thinking	***PBA Check in:** Bring a hard copy of Interview Protocol to Class.
10/18 Week 8	Fraction Concepts	**Van de Walle:** 14. Developing Fraction Concepts 15. Developing Fraction Operations **Look For:** Something you don't understand	***PBA Check in:** Send instructor a link to your PBA Assessment tasks and questions **Lesson 1: Part B: Reflection with Student work analysis due: (30%)**
10/25 Week 9	Fraction Operations and Decimal and Percents Review Overall Richness of Mathematics (MQI)	**Van de Walle:** 16. Developing Decimal and Percent Concepts and Decimal Computation *In class: Bring Lesson 2 with the Anticipated Student Responses-Vet lesson 2 with a peer* **Look For:** Something you have seen at your school	***PBA Check in:** send instructor the tasks and questions and start getting to know your student :) **CONDUCT THE INTERVIEW by 11/7 so you can use**

	Problem-Based Lesson Presentation #5		**11/14 to transcribe and write the report.**
11/1 Week 10	Proportional Reasoning And Measurement Concepts	**Van de Walle:** 17. Ratios, Proportions, and Proportional Reasoning; 18. Developing Measurement Concepts **Look For:** Something that intrigues you	**Lesson 2: Part A Plan due**
11/8 Week 11	Geometry Area/Perimeter and the Math Workshop	**Van de Walle:** 19. Geometric Thinking and Geometric Concepts **Look For:** An activity to share	***PBA Check in:** Transcribe key conversation pieces
11/15 Week 12 Online Module	Data Analysis Online class **Blackboard Assignment:** **Noticing Part 2 assignment**	**Van de Walle:** 20. Developing Concepts of Data Analysis **Look For:** Something you struggle with	
11/22 Week 13	Probability	**Van de Walle:** 21. Exploring Concepts of Probability **Look For:** Something that surprises you	**Blackboard Assignment:Lesson 2: Part 2- Reflection with Student work** **Video Vignette #2 Lesson Analysis** ***PBA Check in:** Bring DRAFT to Class
11/29	**THANKSGIVING BREAK** ☺		
12/6 Week 15	Math Game Day Sharing Our Work: PBA	**Van de Walle:** 22. Developing Concepts of Exponents, Integers, and Real Numbers	**PBA Due**

	Reflecting on Our Learning	**In class: PBA presentation and Math Games around the world** **Look For:** The most important thing	

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 https://catalog.gmu.edu/policies/honor-code-system/).
- 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 https://ds.gmu.edu/).
- Students must silence all sound emitting devices 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/.
- For information on student support resources on campus, see https://ctfe.gmu.edu/teaching/student-support-resources-on-campus

- 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 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
- **SPA Standards:** ACEI 1, 3.1, 3.2, 3.3, 4

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 lesson does not have to be taught, though it can be taught or co-taught, based upon your program and clinical placement options.* The individualized instruction and assessment plan should include the following sections:

Section 1. Description of the Learner (2-3 pages)

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.

Include in your planning a response to the following question: How do you address the special needs of the learner? Write a description of and rationale for instructional adaptations and accommodations needed.

Section 2. Learning Objectives and Rationale (1/2 – 1 page)

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

Section 3. Instructional Strategies (1-2 pages)

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 cognitive, linguistic, social, emotional, and/or physical developmental skill levels and abilities, interests and educational needs. Include the use of augmentative and alternative communication systems and assistive technologies or other appropriate technologies used to address learning needs. Write a rationale for each showing how the strategies support learning and success for this learner.

Section 4. Assessment and Documentation of Learner Progress (1-2 pages)

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.

Section 5. Reflection (1-2 pages)

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 (high, low, mid, mixed)? 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

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SCORING GUIDELINES

- **4 (Exceeds Standard):** Candidates receive a score of 4 if they perform beyond the expectations of candidates at this point in their programs. There is evidence that candidates have done additional research, identified additional resources, and/or demonstrate exceptional understanding and application of the standard.
- **3 (Meets Standard):** This is the TARGET score. This score reflects that candidates have met the standard at the level expected at this point in their program. Candidates who receive a 3 have successfully met the standard.
- **2 (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.
- **1 (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 (1)	Approaches Standard (2)	Meets Standard (3)	Exceeds Standard (4)
SECTION 1. DESCRIPTION OF THE LEARNER				
The candidate regularly assesses individual and group performance in order to design and adapt instruction to meet learners' needs in each area of development (cognitive, linguistic, social, emotional, and physical) and scaffolds the next level of development. **InTASC 1; VDOE 1; ACEI 1.0** 	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.	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.	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.	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. The candidate describes and provides examples of impact of learner characteristics on learning.

The candidate accesses resources, supports, and specialized assistance and services to meet particular learning differences or needs. **InTASC 2; VDOE 1; ACEI 3.2** 	The candidate does not identify either adaptations or accommodations to support learner achievement of learning objectives.	The candidate identifies either adaptations or accommodations that do not fully align with identified needs.	The candidate identifies and describes appropriate adaptations or accommodations that support learner achievement of learning objectives/goals, including technology.	The candidate thoroughly describes multiple, appropriate adaptations or accommodations that clearly support learner achievement of learning objectives/goals, including technology.

Performance	Does Not Meet Standard (1)	Approaches Standard (2)	Meets Standard (3)	Exceeds Standard (4)
Statement of Educational Need				
The candidate effectively uses multiple and appropriate types of assessment data to identify each learner's learning needs and to develop differentiated learning experiences. **InTASC 6; VDOE 4; ACEI 4.0**	The candidate does not address learner educational needs or inappropriately uses assessment data to create a statement of educational need.	The candidate uses assessment data to create a statement of educational need that is not well aligned with assessment results.	The candidate uses assessment data to create an appropriate statement of educational need that is aligned with assessment results.	The candidate effectively uses assessment data from multiple sources to create a thorough and appropriate statement of educational need that is directly aligned with assessment results.
SECTION 2. LEARNING OBJECTIVES				
The candidate individually and collaboratively selects and creates learning objectives that are appropriate for curriculum goals and content standards, and are relevant to learners. **InTASC 7; VDOE 2; ACEI 3.1**	The candidate identifies learning objectives that are either incomplete because related outcomes are not identified or the objectives are not directly related to learner educational need.	The candidate identifies learning objectives without relevance to learner educational need.	The candidate identifies learning objectives with related outcomes that are relevant to individual learner needs.	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.
Rationale for Learning Objectives				
The candidate identifies objectives for instruction based on formative and summative assessment data, prior learner knowledge, and learner interest. **InTASC 7; VDOE 2; ACEI 4.0**	The candidate does not identify objectives for the learner that are aligned to specific learning goals/outcomes and/or the relationship of the learning objectives to learner educational needs is missing or unclear.	The candidate selects objectives for the learner that are poorly aligned to specific learning goals/outcomes and/or the relationship of the learning objectives to learner educational needs is missing or unclear.	The candidate selects objectives for the learner that are aligned to specific learning goals/outcomes and/or the relationship of the learning objectives to learner educational needs is clear.	The candidate selects objectives for the learner that are aligned to specific learning goals/outcomes and/or the relationship of the learning objectives to learner educational needs is clear. Rationales for the selection of those objectives and how they support the achievement of the learning goals are included.
SECTION 3. INSTRUCTIONAL STRATEGIES AND ADAPTATIONS				
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. **InTASC 7; VDOE 2; ACEI 3.2**	The candidate does not identify instructional strategies or identifies instructional strategies that are not related to the learning objectives or learning needs.	The candidate identifies instructional strategies that are inappropriate for meeting the learning objectives or learning needs.	The candidate identifies evidence-based instructional strategies that are aligned to the learning objectives and learning needs.	The candidate identifies evidence-based instructional strategies that are aligned to specific learning objectives and learning needs. The candidate provides evidence of the effectiveness of these selected learning strategies through data analysis of the assessment.

Performance	Does Not Meet Standard (1)	Approaches Standard (2)	Meets Standard (3)	Exceeds Standard (4)
The candidate uses a variety of instructional strategies to encourage learners to develop an understanding of the content and to apply knowledge in meaningful ways. **InTASC 8; VDOE 3; ACEI 3.3** 	The instructional strategies used by the candidate do not encourage an understanding of content.	The candidate uses limited instructional strategies to encourage learners to develop an understanding of the content and to apply that knowledge in meaningful ways.	The candidate uses a variety of instructional strategies that encourage learners to develop an understanding of the content and to apply that knowledge in meaningful ways.	The candidate provides insight into their own pedagogical and content knowledge to discuss the selection of instructional strategies for the learning experience. These instructional strategies encourage all learners to develop an understanding of the content and authentic application of the new knowledge.
The candidate connects concepts and uses different perspectives and digital resources to engage learners in critical thinking, creativity, and collaborative problem solving. **InTASC 5; VDOE 2; ACEI 3.3** 	Candidate does not connect concepts, address different perspectives or use digital resources to engage learners in higher-level learning.	Candidate connect concepts, addresses different perspectives or uses digital resources to engage learners but at a basic level of learning and recall.	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.	Candidate creates multi-disciplinary opportunities and a range of multiple perspectives to engage learners in critical thinking, creativity, and collaborative problem solving.
Rationale for Instructional Strategies and Adaptations				
The candidate understands that each learner's cognitive, linguistic, social, emotional, and physical development influences learning and knows how to make instructional decisions that build on learners' strengths and needs. **InTASC 1; VDOE 1; ACEI 1.0** 	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.	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.	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.	The rationales provided are aligned to the strategies and, the relationship of the instructional strategies to specific learning objectives that meet learner educational needs is clearly and effectively aligned. Multiple pathways to learner achievement of the learning outcomes are provided.
SECTION 4. ASSESSMENT AND DOCUMENTATION OF LEARNER PROGRESS				
The candidate designs assessments that match learning objectives with assessment methods and minimizes sources of bias that can distort assessment results. **InTASC 6; VDOE 4; ACEI 4.0**	The candidate does not describe an assessment plan that 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).	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.	The candidate describes an assessment plan that evaluates all learning objectives and includes both formative and summative assessments that minimize sources of bias. The candidate describes the assessment results that would prompt modification of instructional plans and those specific modifications.	The candidate describes an assessment plan that evaluates all learning objectives, includes formative and summative assessments that minimize sources of bias and includes multiple data sources for each objective. The candidate describes multiple assessment results that would prompt modification of instructional plans and those specific modifications.

SECTION 5 REFLECTION				
The candidate uses ongoing analysis and reflection to improve planning and practice **InTASC 9; ACEI 5.1**	There was no evidence that the candidate used ongoing analysis and/or reflection to improve planning and practice.	The candidate uses marginal analysis and reflection strategies to improve planning and practice.	The candidate uses ongoing analysis and reflection to improve planning and practice	The candidate effectively uses ongoing analysis and deep reflection to improve planning and practice.