George Mason University
College of Education and Human Development
Mathematics Education Leadership

EDCI 644.DL1 – Mathematics Learning and Assessment (K-8)
3 Credits, Spring 2021
Tuesdays, 4:30PM-7:10PM, Synchronous Online

Faculty

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COVID 19 Procedures

Students, please be aware of and follow all policies and procedures for Mason's Safe Return to Campus: https://www2.gmu.edu/Safe-Return-Campus

Prerequisites/Corequisites

Admission to the Mathematics Education Leadership Master's degree program or instructor permission.

University Catalog Course Description

Introduces students to learning theories and associated assessment practices specific to mathematics education. Intended for mathematics specialists and teachers interested in problems of learning and assessment across K-8 settings in mathematics education. This course is designed for master's level students in the mathematics education leadership program.

Course Overview

Not Applicable.

Course Delivery Method

This course will be delivered online (76% or more) using a synchronous format via Blackboard Learning Management system (LMS) housed in the MyMason portal. You will log in to the Blackboard (Bb) course site using your Mason email name (everything before @masonlive.gmu.edu) and email password. The course site will be available on 1/10/2021.

Under no circumstances, may candidates/students participate in online class sessions (either by phone or Internet) while operating motor vehicles. Further, as expected in a face-to-face class meeting, such online participation requires undivided attention to course content and communication.

Technical Requirements

To participate in this course, students will need to satisfy the following technical requirements:

- High-speed Internet access with standard up-to-date browsers. To get a list of Blackboard's supported browsers see: https://help.blackboard.com/Learn/Student/Getting_Started/Browser_Support#supported-browsers

  To get a list of supported operation systems on different devices see: https://help.blackboard.com/Learn/Student/Getting_Started/Browser_Support#tested-devices-and-operating-systems

- Students must maintain consistent and reliable access to their GMU email and Blackboard, as these are the official methods of communication for this course.
- Students will need a headset microphone for use with the Blackboard Collaborate web conferencing tool. [Delete this sentence if not applicable.]
- Students may be asked to create logins and passwords on supplemental websites and/or to download trial software to their computer or tablet as part of course requirements.
- The following software plug-ins for PCs and Macs, respectively, are available for free download: [Add or delete options, as desire.]
  - Adobe Acrobat Reader: https://get.adobe.com/reader/
  - Windows Media Player: https://support.microsoft.com/en-us/help/14209/get-windows-media-player
  - Apple Quick Time Player: www.apple.com/quicktime/download/

Expectations

- Course Week:
  Our course week will begin on the day that our synchronous meetings take place as indicated on the Schedule of Classes.
- Log-in Frequency:
  Students must actively check the course Blackboard site and their GMU email for communications from the instructor, class discussions, and/or access to course materials at least 3 times per week. In addition, students must log-in for all scheduled online synchronous meetings.
- Participation:

Students are expected to actively engage in all course activities throughout the semester, which includes viewing all course materials, completing course activities and assignments, and participating in course discussions and group interactions.

- Technical Competence:
  Students are expected to demonstrate competence in the use of all course technology. Students who are struggling with technical components of the course are expected to seek assistance from the instructor and/or College or University technical services.
- Technical Issues:
  Students should anticipate some technical difficulties during the semester and should, therefore, budget their time accordingly. Late work will not be accepted based on individual technical issues.
- Workload:
  Please be aware that this course is **not** self-paced. Students are expected to meet *specific deadlines* and *due dates* listed in the **Class Schedule** section of this syllabus. It is the student's responsibility to keep track of the weekly course schedule of topics, readings, activities and assignments due.
- Instructor Support:
  Students may schedule a one-on-one meeting to discuss course requirements, content or other course-related issues. Those unable to come to a Mason campus can meet with the instructor via telephone or web conference. Students should email the instructor to schedule a one-on-one session, including their preferred meeting method and suggested dates/times.
- Netiquette:
  The course environment is a collaborative space. Experience shows that even an innocent remark typed in the online environment can be misconstrued. Students must always re-read their responses carefully before posting them, so as others do not consider them as personal offenses. *Be positive in your approach with others and diplomatic in selecting your words*. Remember that you are not competing with classmates, but sharing information and learning from others. All faculty are similarly expected to be respectful in all communications.
- Accommodations:
  Online learners who require effective accommodations to insure accessibility must be registered with George Mason University Disability Services.

Learner Outcomes or Objectives

This course is designed to enable students to do the following:

1. Understand the learning theories fundamental to mathematics education.
2. Understand the developmental progressions underpinning mathematics learning.
3. Develop an understanding of various forms of mathematics learning assessment related to theories of mathematics learning.
4. Understand the assessment of students' thinking at multiple levels.

Professional Standards (National Council of Teachers of Mathematics (NCTM) NCATE Mathematics Content for Elementary Mathematics Specialist (NCATE) *Addendum to the NCTM NCATE Standards 2012*)

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

A. **Standard 4:** Mathematical Learning Environment

Effective elementary mathematics specialists exhibit knowledge of child, pre-adolescent, and adult learning, development, and behavior. They use this knowledge to plan, create, and assist teachers in planning and creating sequential learning opportunities grounded in mathematics education research where students are actively engaged in the mathematics they are learning and building from prior knowledge and skills. They demonstrate, promote, and assist teachers in demonstrating and promoting a positive disposition toward mathematical practices and learning and exhibit and support the equitable and ethical treatment of and high expectations for all students. They include and assist teachers in embracing culturally relevant perspectives in teaching, in recognizing individual student differences, and in using instructional tools such as manipulatives, digital tools, and virtual resources to enhance student learning, while recognizing the possible limitations of such tools.

- **b.** Plan, create, and coach/mentor teachers in creating developmentally appropriate, sequential, and challenging learning opportunities grounded in mathematics education research in which students are actively engaged in building new knowledge from prior knowledge and experiences
- **d.** Demonstrate and encourage equitable and ethical treatment of and high expectations for all students.
- **a.** Apply mathematical content and pedagogical knowledge in the selection, use, and promotion of instructional tools such as manipulatives and physical models, drawings, virtual environments, presentation tools, and mathematics-specific technologies (e.g., graphing tools and interactive geometry software); and make and nurture sound decisions about when such tools enhance teaching and learning, recognizing both the insights to be gained and possible limitations of such tools

Required Texts

Donovan, M. S. & Bransford, J. (2004). *How students learn: Mathematics in the classroom*. National Research Council.
FREE PDF: https://www.nap.edu/catalog/11101/how-students-learn-mathematics-in-the-classroom

Fennell, F., Kobett, B. M., & Wray, J. A. (2017). *The formative 5: Everyday assessment techniques for every math classroom.* Corwin.

Silver, E. A., & Mills, V. L. (Eds.). (2018). *A fresh look at formative assessment in mathematics teaching.* NCTM

Recommended Texts

American Psychological Association (2020). *Publication Manual of the American Psychological Association* (7th edition). American Psychological Association.

National Council of Teachers of Mathematics. (2014). *Principles to actions: Ensuring mathematical success for all.* NCTM.

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).

This course will introduce students to the diverse learning theories and associated assessment practices specific to mathematics education. Topics will also include the historical development of learning theories as well as emerging theories. Assessment topics will include test design, problem-based assessment as well as other forms of assessment of mathematics learning across K-8. The course is intended for mathematics specialists, mathematics teachers, and pre-service mathematics teachers interested in problems of learning and assessment in mathematics education.

- **Assignments and/or Examinations**

  Reading, Participation, Collaboration & Attendance (15%)

  Attendance: It is your responsibility to attend all class sessions. Please report your reasons for any absences to the instructor in writing.

  Tardiness: It is your responsibility to be on time for each class session. Please report your reasons for any tardiness to the instructor in writing.

  a) A commitment to participation in class discussions and course depends heavily and primarily on the regular attendance and participation of all involved. Participation will include taking part in discussions informed by critical reading and thinking, leading discussions about selected mathematics problems, and sharing with the class the products of various writing, reflection, lesson planning, and field experience assignments. The expectations, demands, and workload of this course are professional and high.
  b) A commitment to reading reflectively and critically the assigned readings. The readings will be used to provide a framework and coherent theme to the course content. They have been selected to introduce themes in curricular development as well as research and critical commentary on mathematics curriculum.

	LEVEL OF PERFORMANCE			
ELEMENT	***Distinguished*** *(10 points)*	***Proficient*** *(7 - 9 points)*	***Basic*** *(5 - 6 points)*	***Unsatisfactory*** *(0 - 4 points)*
Attendance & Participation	The student attends all classes, is on time, is prepared and follows outlined procedures in case of absence.	The student attends most classes, is on time, is prepared and follows outlined procedures in case of absence.	The student is absent for multiple classes and follows outlined procedures in case of absence. At times the	The student is frequently late for class or absences are not documented by following the

	The student actively participates and continually supports the members of the learning group and the members of the class. Presentations demonstrate a deep knowledge of content as well as implications for teaching.	The student makes active contributions to the learning group and class. Presentations demonstrate sufficient knowledge of content as well as implications for teaching.	student is not prepared for class. Presentations demonstrate minimal knowledge of content and/or implications for teaching.	outlined procedures. The student is frequently not prepared for class and does not actively participate in discussions. Presentations are lacking knowledge of content and connections to teaching.

Group Mathematics Topics and Learning Progression Project (40%)
In groups, the students will explore research literature on their topic, create an annotated bibliography of the literature, select an article that could be shared with teachers, prepare an appropriate assessment within the topic, and prepare a handout on the topic for their peers. Students will explore and present information on one of the following topics and how they address learning progressions for students:

- **Presentations in Class 6**
  - K-2 Rational Numbers
- **Presentations in Class 7**
  - 3-5 Rational Numbers
  - 3-8 Rational Numbers
- **Presentations in Class 8**
  - 6-8 Rational Numbers

Clinical Interview (45%)
(*NCTM NCATE* 4b, 4d, 4e)
This is a Performance-Based Assessment (PBA). Effective teaching requires a keen awareness of how and what your students are thinking and understanding. The experience of conducting a clinical interview is intended to increase your awareness of students' thinking and learning in a detailed manner about a particular mathematics topic. The other focus of this assignment is on concrete manipulatives and their relationship to learning. So, you should select a manipulative (or manipulatives) to accompany the task and then assess how well the manipulative helped the learner to solve the problem. This Performance-Based Assessment will be posted to TK20 for the final evaluation. Additional details for this assignment (project description & rubric) are provided at the end of the syllabus and in Blackboard/Assignments.

- **Other Requirements**

All assignments require APA formatting:
American Psychological Association (2020*). Publication manual of the American psychological association*. Washington, DC.

Specifically, the following aspects of APA formatting should be addressed in any submission:

a. 12 point, Times New Roman font
b. Double spaced
c. Page headers/Running head
d. Cover page with title, author's name and professional affiliation
e. References
f. Headings
g. Citations
h. Clearly organized, grammatically correct, coherent and complete
i. Professional language (i.e. no jargon)

- **Grading**

All assignments are to be turned in to your instructor on time. **Late work will not be accepted for full credit.** Assignments turned in late will receive a 10% deduction from the grade per late day or any fraction thereof (including weekends and holidays).

Course Performance Evaluation Weighting
15% Participation
40% Group Mathematics Topics and Learning Progressions Project
45% Clinical Interview

The final evaluation criteria utilizes the graduate grading scale and is as follows:

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

TK20/Performance-Based Assessment(s) Submission Requirement:
Every student registered for any Mathematics Education Leadership course with a required TK20 performance-based assessment (designated as such in the syllabus) must submit these assessments 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.

- **For Master's Degrees**:

Candidates must have a minimum GPA of 3.00 in coursework presented on the degree application, which may include no more than 6 credits of C. (Grades of C+, C-, or D do not apply to graduate courses. The GPA calculation excludes all transfer courses and Mason non-degree studies credits not formally approved for the degree).

- **For Endorsement Requirements**

Candidates must have a grade of B or higher for all licensure coursework (endorsement coursework).

Professional Dispositions

Students are expected to exhibit professional behaviors and dispositions at all times. Education professionals are held to high standards, both inside and outside of the classroom. Educators are evaluated on their behaviors and interactions with students, parents, other professionals, and the community at large. At the College of Education and Human Development, dispositions may play a part in the discussions and assignments of any/all courses in a student's program (and thus, as part or all of the grade for those assignments). For additional information:

See https://cehd.gmu.edu/students/polices-procedures/

This course will require students to audiotape, videotape, or use the audio/video conferencing feature. Students should dress professionally, speak professionally, and aware of their recording surroundings and backgrounds. Background noise (such as television, music, conversations, etc.) and inappropriate background video are distracting, unprofessional, and not allowed in this course.

Class Schedule

Reading Key

HSL = How Students Learn F5 = Formative 5 AFLFA = A Fresh Look on Formative Assessment

Date	Topics	Readings Due	Assignments Due
Week 1 1/26 **Format** Synchronous	Technology Briefing Class Overview Introduction		**Profile Picture Posted in Collaborate Ultra**
Week 2 2/02 **Format** Synchronous	Principles of Learning Theories & Mathematical Understanding Learning Trajectories Mathematics Topics and Learning Progressions Project Explained	HSL: Ch. 1 F5: Part 1 AFLAFA: Foreword & Preface	**Introduction Assignment** *(Assignments)*

Week 3 2/09 **Format** Synchronous	Formative Assessment: What, Why & How? Observations Library Tools for Research: Anne Driscoll Presentation Clinical Interview PBA Explained	HSL: Ch. 5 F5: Chapter 1 AFLAFA: Chapter 1 & 2	
Week 4 2/16 **Format** Synchronous	Designing A Clinical Interview Cognitively Guided Instruction Interviews Mathematics Topics and Learning Progressions Group Work	F5: Chapter 2 AFLAFA: Chapter 3 & 4	
Week 5 2/23 **Format** Synchronous	Culturally Responsive Pedagogy Show Me Mathematics Topics and Learning Progressions Group Work	F5: Chapter 3 AFLAFA: Chapter 5 & 6	**Clinical Interview Part I: The Plan** *(Assignments)*
Week 6 3/02	Whole Number Sense Learning Progressions	HSL: Chapter 6	**Group 1 & 2 Presentations**

Format Synchronous			Group 1 & 2 Mathematics Topics and Learning Progressions Project Due *(Assignments)*
Week 7 3/09 **Format** Synchronous	Rational Number System Learning Progressions	HSL: Chapter 7	**Group 3 & 4 Presentations** Group 3 & 4 Mathematics Topics and Learning Progressions Project Due *(Assignments)*
Week 8 3/16 **Format** Synchronous	Functions Learning Progressions	HSL: Chapter 8	**Group 5 & 6 Presentations** Group 5 & 6 Mathematics Topics and Learning Progressions Project Due *(Assignments)*
Week 9 3/23 **Format** Synchronous	Hinge Questions Mathematical Tasks Response to Intervention	F5: Chapter 4 AFLAFA: Chapters 7 & 8	
Week 10 3/30 **Format** Asynchronous	Clinical Interview Work Session		

Week 11 4/06 **Format** Asynchronous	Clinical Interview Work Session		**Clinical Interview Part II: Analysis of Evidence** *(Assignments)*
Week 12 4/13 **Format** Synchronous	Improving Mathematics Instruction Exit Tasks	AFLAFA: Chapters 9 & 10 F5: Chapter 5	**Clinical Interview Part III: Evaluation & Instructional Implications** *(Assignments)*
Week 13 4/20 **Format** Asynchronous	Clinical Interview Work Session	AFLAFA: Chapters 11 & 12	**Clinical Interview Part IV: Reflection** *(Assignments)*
Week 14 4/27 **Format** Synchronous	A Vision Moving Forward		
Week 15 5/04 **Format** Synchronous	Sharing of Clinical Interview Projects		**Clinical Interview Project Due to TK20** *(Assessments)*

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 https://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 Disability Services – An Office of University Life).

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 https://its.gmu.edu/knowledge-base/blackboard-instructional-technology-support-for-students/.
- 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/students/ .

Clinical Interview Rubric

(Course Performance-Based Assessment)

Level/Criteria	4	3	2	1
	Exceeds Expectations	**Meets Expectations**	**Developing**	**Does Not Meet Expectations**
CLINICAL INTERVIEW PART I: THE PLAN				
THE CHILD **NCTM Standard 4d** Demonstrate and encourage equitable and ethical treatment of and high expectations for all students.	The plan includes an asset-based description of the child with all of the following elements: ● Grade level ● Age ● Gender ● Race ● Academic ability level ● Child's mathematical understanding on the mathematics topic assessed ● Child's performance in other academic areas	The plan includes an asset-based description of the child with seven of the following elements: ● Grade level ● Age ● Gender ● Race ● Academic ability level ● Child's mathematical understanding on the mathematics topic assessed ● Child's performance in other academic areas	The plan includes an asset-based description of the child with five to six of the following elements: ● Grade level ● Age ● Gender ● Race ● Academic ability level ● Child's mathematical understanding on the mathematics topic assessed ● Child's performance in other academic areas	The plan includes an asset-based description of the child with four or fewer of the following elements: ● Grade level ● Age ● Gender ● Race ● Academic ability level ● Child's mathematical understanding on the mathematics topic assessed ● Child's performance in other academic areas

	● Child's performance in social or behavioral areas	● Child's performance in social or behavioral areas	● Child's performance in social or behavioral areas	● Child's performance in social or behavioral areas
THE MATHEMATICS CONCEPT & FORMS OF REPRESENTATION **NCTM Standard 4e** Apply mathematical content and pedagogical knowledge in the selection, use, and promotion of instructional tools such as manipulatives and physical models, drawings, virtual environments, presentation tools, and mathematics-specific technologies (e.g., graphing tools and interactive geometry software)	The plan describes the mathematics concept and forms of representation with all of the following elements: ● Information on age-appropriate variations of the mathematics concept ● One clearly described and mathematically accurate concept ● Three different forms of representation, with different examples in each form ● Connections among representational forms ● References are cited	The plan describes the mathematics concept and forms of representation with four of the following elements: ● Information on age-appropriate variations of the mathematics concept ● One clearly described and mathematically accurate concept ● Three different forms of representation, with different examples in each form ● Connections among representational forms ● References are cited	The plan describes the mathematics concept and forms of representation with three of the following elements: ● Information on age-appropriate variations of the mathematics concept ● One clearly described and mathematically accurate concept ● Three different forms of representation, with different examples in each form ● Connections among representational forms ● References are cited	The plan describes the mathematics concept and forms of representation with two or fewer of the following elements: ● Information on age-appropriate variations of the mathematics concept ● One clearly described and mathematically accurate concept ● Three different forms of representation, with different examples in each form ● Connections among representational forms ● References are cited
TASKS & QUESTIONS **NCTM Standard 4e** Apply mathematical content and pedagogical knowledge in the selection, use, and promotion of instructional tools such as manipulatives and physical models, drawings, virtual environments, presentation tools, and mathematics-specific technologies (e.g., graphing tools and interactive geometry software)	The plan includes tasks and questions designed to diagnose the child's understanding with all of the following elements: ● Tasks are aligned with the math concept ● Questions are aligned with the math concept ● Questions allow for differentiation and extensions for different levels of student performance	The plan includes tasks and questions designed to diagnose the child's understanding with four of the following elements: ● Tasks are aligned with the math concept ● Questions are aligned with the math concept ● Questions allow for differentiation and extensions for different levels of student performance	The plan includes tasks and questions designed to diagnose the child's understanding with three of the following elements: ● Tasks are aligned with the math concept ● Questions are aligned with the math concept ● Questions allow for differentiation and extensions for different levels of student performance	The plan includes tasks and questions designed to diagnose the child's understanding with two or fewer of the following elements: ● Tasks are aligned with the math concept ● Questions are aligned with the math concept ● Questions allow for differentiation and extensions for different levels of student performance

	● A variety of tasks and questions for each of the three forms of representation ● Tasks are age and developmentally appropriate	● A variety of tasks and questions for each of the three forms of representation ● Tasks are age and developmentally appropriate	● A variety of tasks and questions for each of the three forms of representation ● Tasks are age and developmentally appropriate	● A variety of tasks and questions for each of the three forms of representation ● Tasks are age and developmentally appropriate
CLINICAL INTERVIEW PART II: ANALYSIS OF EVIDENCE				
STUDENT WORK SAMPLES **NCTM Element 4e** Apply mathematical content and pedagogical knowledge in the selection, use, and promotion of instructional tools such as manipulatives and physical models, drawings, virtual environments, presentation tools, and mathematics-specific technologies (e.g., graphing tools and interactive geometry software)	The description of the student's performance includes all of the following: ● A variety of work samples from the child showing work in the concrete form ● A variety of work samples from the child showing work in the pictorial form ● A variety of work samples from the child showing work in the abstract form ● An explanatory analysis and overview of each of the child's work samples ● Clearly explained connections between student work samples	The description of the student's performance includes four of the following: ● A variety of work samples from the child showing work in the concrete form ● A variety of work samples from the child showing work in the pictorial form ● A variety of work samples from the child showing work in the abstract form ● An explanatory analysis and overview of each of the child's work samples ● Clearly explained connections between student work samples	The description of the student's performance includes three of the following: ● A variety of work samples from the child showing work in the concrete form ● A variety of work samples from the child showing work in the pictorial form ● A variety of work samples from the child showing work in the abstract form ● An explanatory analysis and overview of each of the child's work samples ● Clearly explained connections between student work samples	The description of the student's performance includes two or fewer of the following: ● A variety of work samples from the child showing work in the concrete form ● A variety of work samples from the child showing work in the pictorial form ● A variety of work samples from the child showing work in the abstract form ● An explanatory analysis and overview of each of the child's work samples ● Clearly explained connections between student work samples
TRANSCRIPT EVIDENCE **NCTM Element 4e** Apply mathematical content and pedagogical knowledge in the selection, use, and promotion of instructional tools such as manipulatives and physical models, drawings, virtual environments,	The transcript includes all of the following: ● Several excerpts from the mathematics assessment using the teacher and the child's actual verbalizations from the assessment (T for teacher; C for child)	The transcript includes three of the following: ● Several excerpts from the mathematics assessment using the teacher and the child's actual verbalizations from the assessment (T for teacher; C for child)	The transcript includes two of the following: ● Several excerpts from the mathematics assessment using the teacher and the child's actual verbalizations from the assessment (T for teacher; C for child)	The transcript includes one or fewer of the following: ● Several excerpts from the mathematics assessment using the teacher and the child's actual verbalizations from the assessment (T for teacher; C for child)

presentation tools, and mathematics-specific technologies (e.g., graphing tools and interactive geometry software)	● Teacher's questioning ● Student's responses ● Teacher's follow-up questioning ● Student's follow-up responses	● Teacher's questioning ● Student's responses ● Teacher's follow-up questioning Student's follow-up responses	● Teacher's questioning ● Student's responses ● Teacher's follow-up questioning Student's follow-up responses	● Teacher's questioning ● Student's responses ● Teacher's follow-up questioning Student's follow-up responses
EVIDENCE OF QUESTIONING **NCTM Standard 4e** Apply mathematical content and pedagogical knowledge in the selection, use, and promotion of instructional tools such as manipulatives and physical models, drawings, virtual environments, presentation tools, and mathematics-specific technologies (e.g., graphing tools and interactive geometry software)	A description about questioning is included with all of the following: ● Evidence of a variety of questions encouraging the child to express his/her thinking ● Evidence of higher-level questions to encourage deeper thinking and responses from the child ● Reflection about what was gained from posing specific questions to probe for understanding ● Reflection about missed opportunities for questioning	A description about questioning is included with three of the following: ● Evidence of a variety of questions encouraging the child to express his/her thinking ● Evidence of higher-level questions to encourage deeper thinking and responses from the child ● Reflection about what was gained from posing specific questions to probe for understanding ● Reflection about missed opportunities for questioning	A description about questioning is included with two of the following: ● Evidence of a variety of questions encouraging the child to express his/her thinking ● Evidence of higher-level questions to encourage deeper thinking and responses from the child ● Reflection about what was gained from posing specific questions to probe for understanding ● Reflection about missed opportunities for questioning	A description about questioning is included with one or fewer of the following: ● Evidence of a variety of questions encouraging the child to express his/her thinking ● Evidence of higher-level questions to encourage deeper thinking and responses from the child ● Reflection about what was gained from posing specific questions to probe for understanding ● Reflection about missed opportunities for questioning
CLINICAL INTERVIEW PART III: EVALUATION & INSTRUCTIONAL IMPLICATIONS				
THE EVALUATION **NCTM Element 4b** Plan, create, and coach/mentor teachers in creating developmentally appropriate, sequential, and challenging learning opportunities grounded in mathematics education research in which students are actively engaged in building new knowledge from prior	The evaluation of the child's understanding includes all of the following: ● An accurate and detailed description of the child's current level of understanding of the mathematics concept ● Evidence from the assessment to support your conclusions	The evaluation of the child's understanding includes three of the following: ● An accurate and detailed description of the child's current level of understanding of the mathematics concept ● Evidence from the assessment to support your conclusions	The evaluation of the child's understanding includes two of the following: ● An accurate and detailed description of the child's current level of understanding of the mathematics concept ● Evidence from the assessment to support your conclusions	The evaluation of the child's understanding includes one or fewer of the following: ● An accurate and detailed description of the child's current level of understanding of the mathematics concept ● Evidence from the assessment to support your conclusions

knowledge and experiences.	● Mathematical terms to describe specific types of behaviors, verbalizations, and observations ● Conclusions about mathematical understandings are based on sources on mathematics development	● Mathematical terms to describe specific types of behaviors, verbalizations, and observations ● Conclusions about mathematical understandings are based on sources on mathematics development	● Mathematical terms to describe specific types of behaviors, verbalizations, and observations ● Conclusions about mathematical understandings are based on sources on mathematics development	● Mathematical terms to describe specific types of behaviors, verbalizations, and observations ● Conclusions about mathematical understandings are based on sources on mathematics development
THE INSTRUCTIONAL PLAN **NCTM Element 4b** Plan, create, and coach/mentor teachers in creating developmentally appropriate, sequential, and challenging learning opportunities grounded in mathematics education research in which students are actively engaged in building new knowledge from prior knowledge and experiences.	The instructional plan includes all of the following: ● A detailed description of developmentally appropriate next steps for instruction ● The next steps for instruction are justified by the child's current level of understanding ● Many specific examples of activities and tasks are provided to support the next steps of instruction ● Mathematical terms specific to the mathematical concept are used to describe next steps of instruction ● Instructional next steps are supported by information from other sources on mathematics development	The instructional plan includes four of the following: ● A detailed description of developmentally appropriate next steps for instruction ● The next steps for instruction are justified by the child's current level of understanding ● Many specific examples of activities and tasks are provided to support the next steps of instruction ● Mathematical terms specific to the mathematical concept are used to describe next steps of instruction ● Instructional next steps are supported by information from other sources on mathematics development	The instructional plan includes three of the following: ● A detailed description of developmentally appropriate next steps for instruction ● The next steps for instruction are justified by the child's current level of understanding ● Many specific examples of activities and tasks are provided to support the next steps of instruction ● Mathematical terms specific to the mathematical concept are used to describe next steps of instruction ● Instructional next steps are supported by information from other sources on mathematics development	The instructional plan includes two or fewer of the following: ● A detailed description of developmentally appropriate next steps for instruction ● The next steps for instruction are justified by the child's current level of understanding ● Many specific examples of activities and tasks are provided to support the next steps of instruction ● Mathematical terms specific to the mathematical concept are used to describe next steps of instruction ● Instructional next steps are supported by information from other sources on mathematics development
CLINICAL INTERVIEW PART IV: REFLECTION				

REFLECTION	The reflection includes all of the following: ● Implementing the assessment ● Describing the clinical interview ● Learning about assessment techniques ● Creating questions and tasks for the mathematics concept ● Adapting the interview for another child ● Learning about how children learn mathematics ● Describing how a classroom teacher might use a diagnostic mathematics assessment	The reflection includes six of the following: ● Implementing the assessment ● Describing the clinical interview ● Learning about assessment techniques ● Creating questions and tasks for the mathematics concept ● Adapting the interview for another child ● Learning about how children learn mathematics ● Describing how a classroom teacher might use a diagnostic mathematics assessment	The reflection includes five of the following: ● Implementing the assessment ● Describing the clinical interview ● Learning about assessment techniques ● Creating questions and tasks for the mathematics concept ● Adapting the interview for another child ● Learning about how children learn mathematics ● Describing how a classroom teacher might use a diagnostic mathematics assessment	The reflection includes four or fewer of the following: ● Implementing the assessment ● Describing the clinical interview ● Learning about assessment techniques ● Creating questions and tasks for the mathematics concept ● Adapting the interview for another child ● Learning about how children learn mathematics ● Describing how a classroom teacher might use a diagnostic mathematics assessment
APA FORMATTING				
PAPER ORGANIZATION	The paper organization includes all of the following: ● A cover page with title, author's name, and professional affiliation ● The paper is well-organized, grammatically correct, coherent, and complete. ● The paper has distinctive focus and voice. ● The paper uses professional language (i.e., no jargon). ● The paper is presented in an accessible style.	The paper organization includes five of the following: ● A cover page with title, author's name, and professional affiliation ● The paper is well-organized, grammatically correct, coherent, and complete. ● The paper has distinctive focus and voice. ● The paper uses professional language (i.e., no jargon). ● The paper is presented in an accessible style.	The paper organization includes four of the following: ● A cover page with title, author's name, and professional affiliation ● The paper is well-organized, grammatically correct, coherent, and complete. ● The paper has distinctive focus and voice. ● The paper uses professional language (i.e., no jargon). ● The paper is presented in an accessible style.	The paper organization includes three or fewer of the following: ● A cover page with title, author's name, and professional affiliation ● The paper is well-organized, grammatically correct, coherent, and complete. ● The paper has distinctive focus and voice. ● The paper uses professional language (i.e., no jargon).

	● The paper meets APA formatting guidelines.	● The paper meets APA formatting guidelines.	● The paper meets APA formatting guidelines.	● The paper is presented in an accessible style. ● The paper meets APA formatting guidelines.