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

EDCI 644.6M6 and EDCI 644.6M2 – Mathematics Learning and Assessment (K-8) 3 Credits, Spring 2021 Tuesdays, 7:20PM-10:00PM, Synchronous Online

Faculty	
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COVID 19 Procedures

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

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 January 18, 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: <u>https://help.blackboard.com/Learn/Student/Getting Started/Browser Support#supported-browsers</u>

To get a list of supported operation systems on different devices see: <u>https://help.blackboard.com/Learn/Student/Getting Started/Browser Support#tested-devices-and-operating-systems</u>

- 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: <u>https://get.adobe.com/reader/</u>
 - Windows Media Player: <u>https://support.microsoft.com/en-us/help/14209/get-windows-media-player</u>
 - Apple Quick Time Player: <u>www.apple.com/quicktime/download/</u>

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.

• <u>Participation</u>:

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.

• <u>Technical Competence:</u>

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.

• <u>Technical Issues:</u>

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.

• <u>Netiquette:</u>

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.
- e. 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	Proficient	Basic	Unsatisfactory		
	(10 points)	(7 - 9 points)	(5 - 6 points)	(0 - 4 points)		
Attendance	The student attends	The student attends	The student is	The student is		
&	all classes, is on	most classes, is on	absent for multiple	frequently late for		
Participation	time, is prepared	time, is prepared	classes and follows	class or absences		
	and follows outlined	and follows outlined	outlined procedures	are not		
	procedures in case	procedures in case	in case of absence.	documented by		
	of absence.	of absence.	At times the	following the		
			student is not	outlined		
	The student actively	The student makes	prepared for class.	procedures.		
	participates and	active contributions				
	continually supports	to the learning	Presentations	The student is		
	the members of the	group and class.	demonstrate	frequently not		
	learning group and		minimal knowledge	prepared for class		

the members of the	Presentations	of content and/or	and does not
class.	demonstrate	implications for	actively participate
	sufficient	teaching.	in discussions.
Presentations	knowledge of		
demonstrate a deep	content as well as		Presentations are
knowledge of	implications for		lacking knowledge
content as well as	teaching.		of content and
implications for			connections to
teaching.			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:

А	93%-100%	$\mathbf{B}+$	87%-89%	0	Č	70%-79%
A-	90%-92%	В	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	Technology Briefing		Profile Picture Posted in Collaborate Ultra
	Class Overview		
Format			
Synchronous	Introduction		
Week 2	Principles of Learning	HSL: Ch. 1	Introduction Assignment
2/02	Theories & Mathematical	F5: Part 1	(Assignments)
	Understanding	AFLAFA: Foreword & Preface	
Format			
Synchronous	Learning Trajectories		
	Mathematics Topics and Learning Progressions Project Explained		
Week 3	Formative Assessment:	HSL: Ch. 5	
2/09	What, Why & How?	F5: Chapter 1	
		AFLAFA: Chapter 1 & 2	
Format	Observations		
Synchronous			

Library Tools for Research: Anne Driscoll Presentation Clinical Interview PBA Explained		
	_	
	AFLAFA: Chapter 3 & 4	
Cognitively Guided Instruction		
Interviews		
Mathematics Topics and Learning Progressions Group Work		
Culturally Responsive	F5: Chapter 3	Clinical Interview Part
Pedagogy	AFLAFA: Chapter 5 & 6	I: The Plan
		(Assignments)
Show Me		
Mathematics Topics and Learning Progressions Group Work		
Whole Number Sense	HSL: Chapter 6	Group 1 & 2
Learning Progressions		Presentations
		Group 1 & 2 Mathematics Topics and Learning Progressions Project Due (Assignments)
Rational Number	HSL: Chapter 7	Group 3 & 4 Presentations
-		rresentations
Learning Progressions		Group 3 & 4 Mathematics
	Research: Anne Driscoll Presentation Clinical Interview PBA Explained Designing A Clinical Interview Cognitively Guided Instruction Interviews Mathematics Topics and Learning Progressions Group Work Culturally Responsive Pedagogy Show Me Mathematics Topics and Learning Progressions Group Work Whole Number Sense Learning Progressions	Research: Anne Driscoll PresentationFischapter 2 AFLAFA: Chapter 3 & 4Clinical InterviewF5: Chapter 2 AFLAFA: Chapter 3 & 4Designing A Clinical InterviewF5: Chapter 3 & 4Cognitively Guided InstructionF5: Chapter 3 AFLAFA: Chapter 3 & 4Mathematics Topics and Learning Progressions Group WorkF5: Chapter 3 AFLAFA: Chapter 5 & 6Show MeF5: Chapter 5 & 6Mathematics Topics and Learning Progressions Group WorkF5: Chapter 3 AFLAFA: Chapter 5 & 6Show MeHSL: Chapter 6Mathematics Topics and Learning Progressions Group WorkHSL: Chapter 7

Format			Topics and Learning
Synchronous			Progressions Project Due
			(Assignments)
Week 8	Functions Learning Progressions	HSL: Chapter 8	Group 5 & 6 Presentations
3/16	Togressions		Tresentations
Format Synchronous			Group 5 & 6 Mathematics Topics and Learning Progressions Project Due (Assignments)
Week 9	Hinge Questions	F5: Chapter 4	
3/23	Mathematical Tasks	AFLAFA: Chapters 7 & 8	
Format	Response to Intervention		
Synchronous			
Week 10	Clinical Interview Work		
3/30	Session		
Format			
Asynchronous			
Week 11	Clinical Interview Work		Clinical Interview Part
4/06	Session		II: Analysis of Evidence
			(Assignments)
Format			
Asynchronous			
Week 12	Improving Mathematics	AFLAFA: Chapters 9 & 10	Clinical Interview Part
4/13	Instruction	F5: Chapter 5	III: Evaluation & Instructional
			Implications
Format	Exit Tasks		(Assignments)
Synchronous			
Week 13	Clinical Interview Work	AFLAFA: Chapters 11 & 12	Clinical Interview Part
4/20	Session		IV: Reflection
			(Assignments)

Format Asynchronous		
Week 14	A Vision	
4/27		
	Moving Forward	
Format		
Synchronous		
Week 15	Sharing of Clinical	Clinical Interview
5/04	Interview Projects	Project Due to TK20
		(Assessments)
Format		
Synchronous		

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: <u>http://cehd.gmu.edu/values/</u>.

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 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 <u>tk20help@gmu.edu</u> or <u>https://cehd.gmu.edu/aero/tk20</u>. Questions or concerns regarding use of Blackboard should be directed to <u>https://its.gmu.edu/knowledge-base/blackboard-instructional-technology-support-for-students/</u>.
- 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 <u>titleix@gmu.edu</u>.

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	Meets	Developing	Does Not Meet
	Expectations	Expectations		Expectations
CLINICAL INTERVIEW P	ART I: THE PLAN			
THE CHILD	The plan includes an asset-based			
NCTM Standard 4d	description of the	description of the	description of the	description of the
Demonstrate and	child with all of the	child with seven of	child with five to	child with four or
encourage equitable	following elements:	the following	six of the following	fewer of the
and ethical treatment	• Grade level	elements:	elements:	following elements:
of and high	● Age	 Gradelevel 	 Gradelevel 	 Grade level
expectations for all	• Gender	● Age	● Age	● Age
students.	● Race	 Gender 	 Gender 	 Gender
	 Academicability 	● Race	● Race	● Race
	level	 Academicability 	 Academicability 	 Academicability
	• Child's	level	level	level
	mathematical	● Child's	● Child's	● Child's
	understanding on the mathematics	mathematical understanding on	mathematical	mathematical
		the mathematics	understanding on the mathematics	understanding on the mathematics
	topic assessed ● Child's	topic assessed	topic assessed	topic assessed
	performance in	• Child's	• Child's	• Child's
	other academic	performance in	performance in	performance in
	areas	other academic	other academic	other academic
	• Child's	areas	areas	areas
	performancein	● Child's	● Child's	● Child's
	socialor	performancein	performancein	performancein
	behavioral areas	socialor	socialor	socialor
		behavi oral areas	behavi oral areas	behavioral areas
THE MATHEMATICS	The plan describes	The plan describes	The plan describes	The plan describes
CONCEPT & FORMS	the mathematics	the mathematics	the mathematics	the mathematics
OF REPRESENTATION	concept and forms	concept and forms	concept and forms	concept and forms
NCTM Standard 4e	ofrepresentation	ofrepresentation	ofrepresentation	ofrepresentation
NCTW Stanuaru 4e	with all of the	with four of the	with three of the	with two or fewer
Apply mathematical	following elements:	following elements:	following elements:	of the following
content and	 Information on 	 Information on 	 Information on 	elements:
pedagogical	age-appropriate	age-appropriate	age-appropriate	 Information on
knowledge in the	variations of the	variations of the	variations of the	age-appropriate
selection, use, and	mathematics	mathematics	mathematics	variations of the mathematics
promotion of instructional tools	concept ● One clearly	concept ● One clearly	concept ●One clearly	concept
such as manipulatives	• One creatly described and	described and	described and	• One clearly
and physical models,	mathematically	mathematically	mathematically	described and
drawings, virtual	accurate concept	accurate concept	accurate concept	mathematically
environments,	• Three different	• Three different	 Three different 	accurate concept
presentation tools,	forms of	forms of	forms of	 Three different
and mathematics-	representation,	representation,	representation,	forms of
specifictechnologies	with different	with different	with different	representation,
(e.g., graphing tools	examplesineach	examplesineach	examplesineach	with different
	form	form	form	

and interactive	• Connections	• Connections	● Connections	ovemplesinesch
and interactive geometry software)	Connections	Connections		examples in each form
geometry software)	among	among	among representational	Connections
	representational forms	representational forms	forms	
				among
	References are	References are	• References are	representational
	cited	cited	cited	forms
				References are
				cited
TASKS & QUESTIONS	The plan includes	The plan includes	The plan includes	The plan includes
NCTM Standard 4e	tasks and questions	tasks and questions	tasks and questions	tasks and questions
	designed to	designed to	designed to	designed to
Apply mathematical	diagnose the child's	diagnose the child's	diagnose the child's	diagnose the child's
contentand	understanding with	understanding with	understanding with	understanding with
pedagogical	all of the following	four of the	three of the	two or fewer of the
knowledge in the	elements:	following elements:	following elements:	following elements:
selection, use, and	 Tasks are aligned 			
promotionof	with the math	with the math	with the math	with the math
instructional tools	concept	concept	concept	concept
such as manipulatives	 Questions are 			
and physical models,	aligned with the	aligned with the	aligned with the	aligned with the
drawings, virtual	math concept	math concept	math concept	math concept
environments,	 Questions allow 			
presentation tools,	for differentiation	for differentiation	for differentiation	for differentiation
and mathematics-	and extensions	and extensions	and extensions	and extensions
specific technologies	for different	for different	for different	for different
(e.g., graphing tools	levels of student	levels of student	levels of student	levels of student
and interactive	performance	performance	performance	performance
geometry software)	• A variety of tasks			
0,	and questions for	and questions for	and questions for	and questions for
	each of the three			
	forms of	forms of	forms of	forms of
	representation	representation	representation	representation
	• Tasks are age and			
	developmentally	developmentally	developmentally	developmentally
	appropriate	appropriate	appropriate	appropriate
	appropriate	appropriate	appropriate	appropriate
CLINICAL INTERVIEW P	ART II: ANALYSIS OF EV	VIDENCE		1
STUDENT WORK	The description of	The description of	The description of	The description of
SAMPLES	the student's	the student's	the student's	the student's
	performance	performance	performance	performance
NCTM Element 4e	includes all of the	includes four of the	includes three of	includes two or
Apply mathematical	following:	following:	the following:	fewer of the
content and	• A variety of work	• A variety of work	• A variety of work	following:
pedagogical	samples from the	samples from the	samples from the	• A variety of work
knowledge in the	childshowing	childshowing	childshowing	samples from the
selection, use, and	work in the	work in the	work in the	childshowing
promotion of	concrete form	concrete form	concrete form	work in the
instructional tools	• A variety of work	• A variety of work	• A variety of work	concrete form
	•	•	•	• A variety of work
such as manipulatives and physical models,	samples from the childs howing	samples from the childs howing	samples from the child showing	• A variety of work samples from the
drawings, virtual	work in the	work in the	work in the	childshowing
-				-
environments,	pictorial form	pictorial form	pictorial form	work in the
presentation tools,	• A variety of work	• A variety of work	• A variety of work	pictorial form
and mathematics-	samples from the	samples from the	samples from the	• A variety of work
specifictechnologies	childshowing	childshowing	childshowing	samples from the

la a graphingtagla	warkintha	workinthe	workinthe	abildabawing
(e.g., graphing tools	work in the	work in the	work in the	childshowing
and interactive	abstract form	abstract form	abstractform	workinthe
geometry software)	• An explanatory	 An explanatory 	• An explanatory	abstract form
	a nalysis and	analysis and	analysis and	• An explanatory
	overview of each	overview of each	overview of each	analysis and
	of the child's	of the child's	of the child's	overview of each
	worksamples	worksamples	work samples	of the child's
	 Clearly explained 	 Clearly explained 	 Clearly explained 	worksamples
	connections	connections	connections	 Clearly explained
	between student	between student	between student	connections
	worksamples	worksamples	worksamples	between student
				worksamples
TRANSCRIPT	The transcript	The transcript	The transcript	The transcript
EVIDENCE	includes all of the	includes three of	includes two of the	includes one or
NCTM Element 4e	following:	the following:	following:	fewer of the
NCTIVI Element 4e	 Several excerpts 	 Several excerpts 	 Several excerpts 	following:
Apply mathematical	from the	fromthe	from the	 Several excerpts
content and	mathematics	mathematics	mathematics	from the
pedagogical	assessment using	assessment using	assessment using	mathematics
knowledge in the	the teacher and	the teacher and	the teacher and	assessment using
selection, use, and	the child's actual	the child's actual	the child's actual	the teacher and
promotion of	verbalizations	verbalizations	verbalizations	the child's actual
instructional tools	from the	fromthe	from the	verbalizations
such as manipulatives	assessment (T for	assessment (T for	assessment (T for	from the
and physical models,	teacher; C for	teacher; C for	teacher; C for	assessment (T for
drawings, virtual	child)	child)	child)	teacher; C for
environments,	• Teacher's	• Teacher's	• Teacher's	child)
presentation tools,	questioning	questioning	questioning	• Teacher's
and mathematics-	• Student's	• Student's	• Student's	questioning
specific technologies	responses	responses	responses	• Student's
(e.g., graphing tools	• Teacher's follow-	• Teacher's follow-	• Teacher's follow-	responses
and interactive	up questioning	up questioning	up questioning	• Teacher's follow-
geometry software)	• Student's follow-	Student's follow-up	Student's follow-up	up questioning
geometry sortware	up responses	•		Student's follow-up
	upresponses	responses	responses	•
EVIDENCE OF	A doc cription about	A doccription about	A doc cription about	responses
QUESTIONING	A description about	A description about	A description about	A description a bout
QUESTICIVIIVG	questioning is included with all of	questioning is included with three	questioning is included with two	questioning is included with one
NCTM Standard 4e				
المعالية معالم معالم معالية	the following:	of the following:	of the following:	or fewer of the
Apply mathematical	• Evidence of a	• Evidence of a	• Evidence of a	following:
content and	variety of	variety of	variety of	• Evidence of a
pedagogical	questions	questions	questions	variety of
knowledge in the	encouraging the	encouraging the	encouraging the	questions
selection, use, and	child to express	child to express	child to express	encouraging the
promotion of	his/herthinking	his/herthinking	his/herthinking	child to express
instructional tools	• Evidence of	• Evidence of	• Evidence of	his/herthinking
such as manipulatives	higher-level	higher-level	higher-level	• Evidence of
and physical models,	questionsto	questions to	questionsto	higher-level
drawings, virtual	encourage	encourage	encourage	questions to
environments,	deeper thinking	deeper thinking	deeper thinking	encourage
presentation tools,	and responses	and responses	and responses	deeper thinking
and mathematics-	from the child	from the child	from the child	and responses
specifictechnologies	Reflectionabout	 Reflection about 	 Reflection about 	from the child
(e.g., graphing tools	what was gained	what was gained	what was gained	 Reflection about
	from posing	from posing	from posing	what was gained

and interactive	c pocific questions	s posific questions	sposific questions	from posing
and interactive geometry software)	specific questions to probe for understanding • Reflection a bout missed	specific questions to probe for understanding •Reflection a bout missed	specific questions to probe for understanding • Reflection a bout missed	from posing specific questions to probe for understanding • Reflection about
	opportunities for questioning	opportunities for questioning	opportunities for questioning	missed opportunities for questioning
CLINICAL INTERVIEW	PART III: EVALUATIO	ON & INSTRUCTION	ALIMPLICATIONS	4
THE EVALUATION	The evaluation of	The evaluation of	The evaluation of	The evaluation of
NCTM Element 4b	the child's understanding	the child's understanding	the child's understanding	the child's understanding
Plan, create, and coach/mentor teachers in creating developmentally	includes all of the following: ● An accurate and detailed	includes three of the following: ● An accurate and detailed	includes two of the following: ● An accurate and detailed	includes one or fewer of the following: • An accurate and
appropriate, sequential, and challenging learning opportunities grounded in	description of the child's current level of understanding of the mathematics	description of the child's current level of understanding of the mathematics	description of the child's current level of understanding of the mathematics	detailed description of the child's current level of understanding of
mathematics education research in which students are actively engaged in building new	concept • Evidence from the assessment to support your conclusions	concept • Evidence from the assessment to support your conclusions	concept • Evidence from the assessment to support your conclusions	the mathematics concept • Evidence from the assessment to support your
knowl edge from prior knowl edge and experiences.	 Mathematical terms to describe specific types of behaviors, verbalizations, and observations 	 Mathematical terms to describe specific types of behaviors, verbalizations, and observations 	 Mathematical terms to describe specific types of behaviors, verbalizations, and observations 	 conclusions Mathematical terms to describe specific types of behaviors, verbalizations,
	 Conclusions about mathematical understandings are based on sources on 	• Conclusions about mathematical understandings are based on sources on	• Conclusions about mathematical understandings are based on sources on	and observations • Conclusions about mathematical understandings are based on
	mathematics development	mathematics development	mathematics development	sources on mathematics development
THE INSTRUCTIONAL PLAN	The instructional plan includes all of the following:	The instructional plan includes four of the following:	The instructional plan includes three of the following:	The instructional plan includes two or fewer of the
NCTM Element 4b	●A detailed	●A detailed	●A detailed	following:
Plan, create, and coach/mentor teachers in creating developmentally appropriate, sequential, and challenging learning	description of developmentally appropriate next steps for instruction • The next steps for instruction are	description of developmentally appropriate next steps for instruction •The next steps for instruction are	description of developmentally appropriate next steps for instruction •The next steps for instruction are	 A detailed description of developmentally appropriate next steps for instruction The next steps for
opportunities grounded in mathematics	justified by the child's current	justified by the child's current	justified by the child's current	instruction are justified by the child's current

aduaati an kasaakah in	lovel of	level of	lovel of	lovel of
education research in which students are	level of		level of	level of
	understanding	understanding	understanding ●Many specific	understanding
actively engaged in building new	 Many specific examples of 	 Many specific examples of 	examples of	 Many specific examples of
-	activities and		•	
knowledge from prior		activities and	activities and	activities and
knowledge and	tasks are providedto	tasks are providedto	tasks are	tasks are
experiences.	support the next	support the next	provided to support the next	provided to support the next
	steps of	steps of	steps of	steps of
	instruction	instruction	instruction	instruction
	 Mathematical 	 Mathematical 	 Mathematical 	 Mathematical
	terms specific to	terms specific to	terms specific to	terms specific to
	the mathematical	the mathematical	the mathematical	the mathematical
	conceptare used	conceptare used	conceptare used	conceptareused
	to describe next	to describe next	to describe next	to describe next
	steps of instruction	steps of instruction	steps of instruction	steps of instruction
	 Instruction 	 Instructional next 	 Instruction 	 Instructional next
	steps are	steps are	steps are	steps are
	supported by information from	supported by information from	supported by	supported by information from
			information from	
	other sources on mathematics	other sources on mathematics	other sources on mathematics	other sources on mathematics
CLINICAL INTERVIEW P	development	development	development	development
REFLECTION	The reflection	The reflection	The reflection	The reflection
NEILECTION	includesallofthe	includes six of the	includes five of the	includes four or
	following:	following:	following:	fewer of the
	 Implementing the 	 Implementing the 	 Implementing the 	following:
	assessment	assessment	assessment	• Implementing the
	• Describing the	• Describing the	 Describing the 	assessment
	clinical interview	clinical interview	clinical interview	• Describing the
	• Learning a bout	• Learning about	• Learning a bout	clinical interview
	-	assessment	-	
	assessment			●learning about
	assessment techniques		assessment techniques	 Learning about assessment
	techniques	techniques	techniques	assessment
	techniques ● Creating	techniques ●Creating	techniques ●Creating	assessment techniques
	techniques ● Creating questions and	techniques ● Creating questions and	techniques ●Creating questions and	assessment techniques ● Creating
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