Handout #6

National Council of Teachers of Mathematics

Key Assessment #4: Internship

The observation includes behaviors before, during, and after the lesson including, but not limited to, submitted lesson plans, pre-observation and post-observation conferences.

Required Documentation for each observation:

- Pre-Observation Interview Form,
- Class Summary Form,
- Lesson Plan using the Mathematics Lesson Plan Template (Due at least 2 days prior to each observation)

The content supervisor observes the intern twice. It is possible, but unlikely, that some standard criteria will not be observed. In such a case, with the content supervisor's approval, artifacts associated to the internship may be submitted as part of the content internship portfolio. The content supervisor will rate such artifacts.

Possible Artifact might include: video Lesson: video, Class Summary Form, Instruction and Reflection Profile Summary, self-reflection and peer reviews.

(NCTM CAEP Sub-Element Alignment)	Target (3)	Acceptable (2)	Unacceptable (1)
use a variety	al Practices - Problem Solving. of stimulating curricula that proposed to the problem solving to develop con	ovide experiences that	ems. Intern can design and
MakApplmath	e sense of a wide variety of pro y and adapt a variety of strateg nematics and other contexts. nulate and test conjectures in o	blems and persevere in solving les in solving problems confror	
2 a.1	Mathematical activities and investigations provide students with opportunities to use problem solving to develop conceptual understanding.	Mathematical activities and investigations use problem solving to develop conceptual understanding.	Use of problem solving to develop conceptual understanding is limited or unclear.
2a.2	Students are engaged in problem solving activities within the field of mathematics and making connections to real-world contexts.	Students participate in problem solving activities within the field of mathematics. Candidate illustrates (provides) examples of connections to real-world contexts.	Students are not engaged in problem solving activities on the activities only include context within the field of mathematics.
students' problem solving strategies and encourages students to make sense of problems and persevere in solving them.		Encourages a variety of problem solving strategies and encourages students to make sense of problems and persevere in solving them but does not showcase students' strategies.	Communication of problem solving strategies is limited or unclear. Does not encourage students to mak sense of problems and persevere in solving them.
2a.4	Mathematical activities and investigations allow for students to formulate and test conjectures in order to frame generalizations.	Includes experiences that allow for student discovery but lacks the proper foundation for students to frame generalizations.	Does not design experiences that allow for students to formulate and test conjectures in order to frame generalizations.

Mathematical Practices - Reasoning. Effective teachers reason abstractly. Intern can design and use a variety of stimulating curricula that provide experiences that require

- Abstract, reflective and quantitative reasoning with attention to units, constructing viable arguments and proofs and critiquing the reasoning of others;
- Representing and modeling generalizations using mathematics; recognizing structure and expressing regularity in patterns of mathematical reasoning;
- Using multiple representations to model and describe mathematics; and
- Utilizing appropriate mathematical vocabulary and symbols to communicate mathematical ideas to others,

2b.1	Reasons abstractly, reflectively and quantitatively with attention to units, constructing viable arguments and proofs.	Communicates mathematical reasoning with clarity, precision, and logical order.	Communicates mathematical reasoning using inappropriate strategies or flawed arguments that are vague or imprecise.	
2b.2	Able to understand, critique, and respond coherently to the mathematical reasoning and strategies of others. Able to understand correct components of student thinking and offers guidance as needed.	Attempts to understand, critique, and respond coherently to the mathematical reasoning and strategies of others. Inconsistently understands correct components of student thinking or guidance offered do not encourage student perseverance.	No evidence of understanding the mathematical reasoning and strategies of others.	
2b.3	Represents and models generalizations using mathematics while providing opportunities for students to recognize patterns of mathematical reasoning.	Represents and models generalizations using mathematics while recognizing patterns of mathematical reasoning.	Neither represents nor models generalizations using mathematics.	
2b.4	Communicates mathematical ideas using a variety of representations and recognizes and clarifies the connections between the representations.	Communicates mathematical ideas using more than one type of representation but with no attempt to recognize the connections between the representations.	Communicates mathematical ideas using a single representation.	
2b .5	Uses appropriate vocabulary and symbols to communicate mathematical ideas to others, and clearly communicates to students that they are expected to communicate their reasoning precisely.	Uses appropriate vocabulary and symbols to communicate mathematical ideas to others.	Does not use appropriate vocabulary and symbols to communicate mathematical ideas to others.	

(NCTM CAEP Sub-Element Alignment)	Target (3) Acceptable (2)		Unacceptable (1)	
Mathematica mathematica	al Practices - Modeling. Effecti Il models derived from real-wo	ve teachers formulate, represe rld contexts or mathematical p	nt, analyze, and interpret roblems.	
2c.1	Designs experiences that allow students to formulate and represent mathematical models derived from variety of real-world contexts to build mathematical understanding.	Motivates or illustrates the formulation and representation of mathematical models derived from variety of real-world contexts.	Does not recognize mathematical models derived from variety of real- world contexts.	
2c.2	Designs experiences that allow students to <i>analyze</i> and <i>interpret</i> mathematical models derived from variety of real-world contexts to build mathematical understanding.	Motivates and illustrates the <i>analysis</i> and <i>interpretation</i> of mathematical models derived from variety of real-world contexts.	Does not recognize mathematical models derived from variety of real-world contexts.	
Mathematical Practices – Communication. Effective teachers organize mathematical thinking and use the language of mathematics to express ideas precisely, both orally and in writing to multiple audiences.				
2 d	Organizes mathematical thinking and uses the language of mathematics to express ideas precisely to multiple audiences.	Organizes mathematical thinking and uses the language of mathematics to express ideas precisely.	Mathematical thinking is not organized and mathematical ideas are imprecise.	

	Instruction engages students in	Instruction is developmentally	Goals of instruction vague,
3a	developmentally appropriate mathematical investigations and clearly communicates student-learning outcomes based on common core standards.	appropriate and clearly communicates student-learning outcomes based on common core standards.	unclear or not quite appropriate.
strateg	nt Pedagogy — Lesson Planning. Effo ies, differentiated for diverse popul g all students' conceptual understa	ations, and mathematics-specific a	nits that incorporate a variety of and instructional technologies in
3c.1	Lesson plan includes variety of instructional strategies differentiated for diverse populations.	Lesson plan includes more than one instructional strategy that could be differentiated for diverse populations.	Lesson plan does not include a variety of instructional strategies.
3c.2	Lesson plan appropriately incorporates mathematics-specific technologies to effectively build all students' conceptual understanding and procedural proficiency.	Lesson plan appropriately incorporates mathematics-specific technology in an attempt to build students' conceptual understanding and procedural proficiency.	Lesson plan inappropriately incorporates mathematics-specific technology or fails to build students' conceptual understanding and procedural proficiency.
formati	t Pedagogy – Assessment Plan. Eff ve and summative assessments to i ents. (All assessments should be in	inform instruction by reflecting on	mathematical proficiencies for
	Title (december of the strong of the	tern-created and use precise langu	uage and notation.)
	Candidate uses both formative and summative assessments to effectively measure student proficiencies associated to all student-learning outcomes.	Candidate uses both formative and summative assessments to effectively measure student proficiencies associated to all student-learning outcomes.	Assessments do not measure student proficiencies associated to the student learning outcomes.
3f.1	Candidate uses both formative and summative assessments to effectively measure student proficiencies associated to all	Candidate uses both formative and summative assessments to effectively measure student proficiencies associated to all	Assessments do not measure student proficiencies associated to the student learning outcomes.

appropria	te sequential, and challenging learr	on Planning. Effective teachers plan ling opportunities grounded in math g new knowledge for prior knowled	nematics education research in
4b.1	Lesson is sequenced to create challenging learning opportunities that are developmentally appropriate.	Lesson creates learning opportunities that are developmentally appropriate but either too challenging or not challenging enough.	Lesson does not create challenging learning opportunities or are not developmentally appropriate.
4b.2	Instructional strategies are grounded in mathematics education research in which students are actively engaged.	Instructional strategies are grounded in mathematics education research. (5E instruction model, Marzano's Best Practices, etc.)	Lesson plans are not grounded in mathematics education research.
4b.3	Lesson actively engages students in building new knowledge from prior knowledge and experiences.	Lesson builds new knowledge from prior knowledge and experiences.	Lesson does not build new knowledge from prior knowledge and experiences.
Mathema expectation	tical Learning Environment. Effect ons for all students.	ive teachers demonstrate equitable	and ethical treatment of and high
4d	Equitable and ethical treatment of and high expectations for all students is demonstrated during lesson and observed by cooperating teacher during internship.	Equitable and ethical treatment of and high expectations for all students is demonstrated during lesson or observed by cooperating teacher during internship.	No evidence of equitable and ethical treatment of and high expectations for all students.
teachers a manipulat mathema and statis	pply mathematical content and peo lives and physical models, drawings, tics-specific technologies (e.g., grap	ictional Tools and Mathematics-Spi lagogical knowledge to select and u virtual environments, spreadsheet hing tools, interactive geometry sof cisions about when such tools enha d possible limitations of such tools.	se instructional tools such as s, presentation tools, and tware, computer algebra systems.
4e.1	Instructional tools are used to enhance teaching and learning, lesson plan clarifies both the insights to be gained and possible limitations of such tools.	Instructional tools are used to enhance the teaching and learning.	No attempt to use <i>instructional tools</i> and no reasonable explanation why the limitations of the tools do not enhance learning.
4e.2	Mathematics-specific technologies are used to enhance teaching and learning, lesson plan clarifies the insights to be gained.	Mathematics-specific technologies are used to enhance teaching and learning, OR lesson plan explains possible limitations of technologies,	No attempt to use mathematics-specific technologies and no reasonable explanation regarding the possible limitations of technologies.

(NCTM CAEP Sub-Element Alignment)	Target (3)	Acceptable (2)	Unacceptable (1)	
knowledge experience	Student Learning - Student Enge has been created as a consequence that are developmentally applicted specific technology.	ence of their ability to engage st	udents in mathematical	
5b.1	Students are engaged in developmentally appropriate mathematical investigations. Documentation includes evidence that Pacing is appropriate, Lesson captures perplexity, by following the Three-Act Math Tasks (Dan Meyer)or similar engagement methodology, and Students are given an opportunity for reflection.	Documentation that students are engaged in developmentally appropriate mathematical investigations. Documentation includes evidence that Pacing is mostly appropriate, Lesson attempts to capture perplexity but missing a key component, and Students are given an opportunity for reflection.	There is no documentation addressing the engagement of students in developmentally appropriate mathematical investigations	
5b.2	Students use mathematics- specific technologies appropriate to the learning objective.	Students use mathematics- specific technologies but it does not connect to the learning objectives in a meaningful way.	Students do not use mathematics-specific technology and explanation for lack of use not based in sound pedagogy.	
reflect on c which stud conclusion	Student Learning - Assessment diagnostic, formative, and summents' mathematical proficiencies of the lesson, students should be exit ticket, a concept of definition	ative assessment evidence and s have increased as a result of the e given the opportunity to refle	determine the extent to neir instruction. At the ect. Assessments might	
5c. 1	Post-observation Interview: Candidate accurately interprets assessment results, and describes how the assessment evidence will inform future instruction.	Post-observation Interview: Candidate accurately interprets assessment results.	Post-observation Interview: Assessment is flawed or assessment results are inaccurately interpreted.	
5c.2	Assessment evidence demonstrates a positive impact on student learning for each student-learning outcome of the lesson.	Assessment evidence demonstrates a positive impact on student learning on most of the lesson's student learning outcomes.	Assessment does not provide evidence demonstrating a positive impact on student learning on most of the student	

Secondary Mathematics Field Experiences and Clinical Practice — Effective teachers develop a broad experiential base of knowledge, skills, effective approaches to mathematics teaching and learning, and professional behaviors across both middle and high school settings that involve a diverse range and varied groupings of students. Both *content observations*, conferences associated to the observation (with candidate and cooperating teacher), and all supporting documents will inform the below ratings. This rating will be scores only on the summative observation.

Delettic	Tachigs. This facing will be scores only on the summative observation.				
7c.1	Observations provide evidence the teacher candidate has developed the knowledge, skills and professional behaviors necessary to examine the nature of mathematics, how mathematics should be taught, and how students learn mathematics. Evidence spans both middle and high school mathematics and documents specific ways in which candidate has drawn upon research in mathematics education and professional development to inform practice.	Observations provide evidence the teacher candidate has developed the knowledge, skills and professional behaviors necessary to examine the nature of mathematics, how mathematics should be taught, and how students learn mathematics. Evidence spans both middle and high school mathematics.	Observations do not provide evidence the teacher candidate has developed the knowledge, skills or professional behaviors necessary to examine the nature of mathematics, how mathematics should be taught, and how students learn mathematics.		
7c.2	Observations provide evidence the teacher candidate has developed the knowledge, skills and professional behaviors necessary to analyze a range of approaches to mathematics teaching and learning, focusing on tasks, discourse, environment, and assessment. Candidate documents specific collaborations with cooperating teacher, peers, and university supervisors.	Observations provide evidence the teacher candidate has developed the knowledge, skills and professional behaviors necessary to analyze a range of approaches to mathematics teaching and learning, focusing on tasks, discourse, environment, and assessment.	Observations do not provide evidence that the candidate has developed the knowledge, skills or professional behaviors necessary to analyze approaches to mathematics teaching and learning, tasks, discourse, environment, or assessment.		

MTH Lesson Plan

Intern	Cooperating Teacher	
School	University Supervisor	
GradeSubjec	tDate	ionth/Day/Year)
		ionth/Day/Year)
Complete	INSTRUCTION PLAN and submit 48 hours prior to obs	servation.
	1. Place title of lesson here	
Student Learning Outcomes: After completing the unit, student will be able to	Common Core Standards:	Evidence: (Identify what part of the assessment plan will provide evidence of student proficiency.)
Identify instructional strategies have	2. METHODS	
Tuentity instructional strategies have	ve you chosen for this lesson.	
	3. STUDENT GROUPING	
	struction? Will student be working of tc.? If working in groups, specifica	
	4 Vocabulary (Trelude definition	and 1
	4. Vocabulary (Include definition	Jiis. j
5. Real World Application	ns that are explored during this	lesson. (Capture perplexity)

Explain what experiences allow students to formulate, represent, analyze and or interpret mathematical

models derived from a variety of real-world contexts to build mathematical understanding.

6. Strategic Use of Tools/Technology Explain how you and the students strategically use mathematics-specific tools during the lesson to enhance or extend the meaning of the mathematics. If no math-specific tools or technologies are used, explain how the limitations of such tools prohibited their use. Tools: Manipulatives, physical models, drawings, virtual manipulatives or representations, etc. Technologies: Graphing calculators, graphing software, interactive geometry software, computer algebra systems, statistical packages, etc. 7. Insert Activity Plan – use template (repeat for each activity) Name of Activity: 8. ACCOMMODATIONS What accommodations will be made for children with special needs (i.e. teaching, evaluation)? 9. RESOURCES Include a list of any resources used in the development of this lesson. This should be a proper citation of materials used to develop this lesson. Include internet resources, print material in books or journals, and community/school resources. All resources should be modified in some way to improve them.

Activity Plan

Title of the Activity or Lesson:

Goals of the Activity or Lesson: (What mathematical content and processes do you hope students will learn from their work on this activity? Use correct common core labeling.)

Why do students need to learn this?

- This concept connects to future learning. It is important later in the study of ...
- This understanding or skill will enable students to...
- This understanding or skill prepares students for real-work performance tasks of...
- The content enhances analytical or critical thinking skills by...
- The content enhances learning in other disciplines. (Include specifics.)

Setting Up the Mathematical Activity - Engage Phase

A.	In what ways does the task build on students' previous knowledge? What definitions, concepts,	or ideas do
	students need to know in order to begin work on the task?	

•		d a (geome nts will nee	phical, alge	braic, num	erical,) u	ınderstand	ling of
	0						
	0						
	0						

- Students will need to be familiar with ...
- B. What are all the ways the investigation can be completed? (What methods do you think your students use? What misconceptions might students have? What errors might students make?)
- C. What are your expectations for students as they work on and complete this activity? (What resources will students use? How will students work independently, small groups, pairs? How will students record and report their work?)
- D. How will you introduce students to the activity so as not to reduce the demands of the task? How will you engage students?
- > Include a narrative here that described what happens during the engage phase of the lesson.

Exploration Phase: As students are working independently or in small groups:

- A. What questions will you ask to focus their thinking?
- B. What will you see or hear that lets you know how students are thinking about the mathematical ideas?
- C. What questions will you ask to assess students' understanding of key mathematical ideas, problem-solving strategies, or the representations? Attach all graphic organizers, exit ticket, ...
- D. What questions will you ask to advance students' understanding of the mathematical ideas?
- E. What questions will you ask to encourage students to share their thinking with others or to assess their understanding of their peers' ideas?
- Include a narrative here that described what happens during the explore phase of the lesson.

Sharing and Discussing the Activity - Explain Phase

- A. Which solution paths do you want to have shared during the class discussion in order to accomplish the goals for the lesson? Which will be shared first, second, etc? Why?
- B. What will you see or hear that lets you know that students in the class understand the mathematical ideas or problem-solving strategies that are being shared?
- C. How will you orchestrate the class discussion so that students:

Make sense of the mathematical ideas being shared?
Expand on, debate, and question the solutions being shared?
Make connections between their solution strategy and the one shared?
Look for patterns and form generalizations?

- D. What extensions to the activity will you pose that will help students look for patterns, make connections, or form a generalization?
- Include a narrative here that described what happens during the explain phase of the lesson.
- Include a narrative here that described what happens during the elaborate phase of the lesson.
- Explain here how students will summarize their understanding.

REFLECTION AFTER THE OBSERVATION Complete after observation, and submit with 48 hours after the observation. 1. Did you depart from anything you planned for today? If so why? 2. If you were going to teach this class again to the same students, what would you do differently? What would you do the same? Why? 3. Based on what happened today, what do you plan to do next with this class? 4. Identify an individual or group of students who did well in today/s lesson. How do you account for this individual or group's performance? What might you try in the future to further challenge this (these) students? 5. In what specific ways did you assess the students understanding of this lesson? 6. What evidence can you provide to support your claims in the above question? 7. In what ways were the students active learners in todays lesson (as opposed to passive)?



DOMAIN 1: PLANNING AND PREPARATION PRE-OBSERVATION INTERVIEW

Tead	her Intern:	Cooperating Teacher:					
Date	of Observation:	Subject:	Grade:				
Univ	ersity Supervisor:						
Direc	Directions: Complete the form and submit to the University Supervisor via e-mail 48 hours prior to scheduled observation visit.						
1.	Have there been any changes in your inst If so, please explain.	truction plan or in the information on you	r class profile since you previously filled out the forms?				
2.	How does the content of this lesson build	on what students have already studied?					
3.	How does the content of this lesson relate	e to what the students will be learning in	the near future?				
4.	How do the connections between this less	son, past learning, and future learning re	eflect the organization of the subject or discipline as a whole?				
5.	In all of you planning for this lesson, how (Responses might include differentiation in status, skill level, or more individual conce	nstruction for specific a specific gender,	ls of this group of students? culture, language proficiency, exceptionality, economic				



CLASS SUMMARY FORM

Teacher Intern:		Cooperating Teacher/School:				
Date	of Observation: Subject/Grade:	: University Supervisor:				
Plea	se respond to all questions in the space provided.					
1.	How many students will be observed?					
	Total Number					
	Male Students					
	Female Students					
2.	What is the students' age range?					
3.	Approximately how many students are in each of the	he following language categories?				
	English Language Proficient	Limited English Language Proficient				
4.	Approximately how many students have the follow	ing exceptionalities?				
	Blind or visually impaired	Learning disabled				
	Deaf or hearing impaired	Physically disabled				
	Developmentally disabled	Autism				
	Emotionally or behaviorally disabled	504 Accommodations				
	Gifted	Other (please specify)				
5.	Given the following categories, how many students	s are in each of these categories?				
	African American or Black, non-Hispanic	Asian, Asian American, or Pacific Islander				
	Mexican American or Chicano	Native American, Inuit or Aleut				
	Puerto Rican	Other Hispanic				
	White, non-Hispanic	Other (please specify)				
6.	How do you become familiar with your students' background knowledge in terms of both skills and the cultural resources they bring in the classroom?					
7.	How do you communicate with the parents or guard	dians of students in the class? How and for what reasons?				
8.	Is there anything about the learning environment the assigned classroom; there is a new display, pet, or	nat you think might affect your students or the scheduled observation (e.g. this is not your equipment in the room; there is construction going on in the building)? If so, please note.				

CLASS SUMMARY FORM Page 1

9.	What are the most important classroom routines that will be in operation during the observed lesson (e.g. collecting papers, reviewing homework, safety precautions)?
10.	Are there any special circumstances that the observer should be aware of in order to understand what will occur during the scheduled observation (e.g. school wide routines or policies, interruptions, behavior patterns or students)? If so, please explain.
11.	When you need assistance with your teaching skills or when you have difficulties with a student, whom do you talk with (e.g. mentor teachers, other teachers, cooperating teachers, clinical supervisor, principal, professors)?
12.	How do you coordinate learning activities with your cooperating teachers?
13.	In the space below, please provide a simple sketch of the instruction shape for this lesson (e.g. student desks, teacher desk, student work space, playing field, or laboratory). Please attach a seating chart with the students' names (if available) or a list of the students for the class to be observed.

CLASS SUMMARY FORM Page 2