C8. Syllabus 259a

SCHOOL OF EDUCATION AND COUNSELING PSYCHOLOGY

Department of Education
MATTC
EDUC 259A
Elementary Mathematics Methods I (3 units)
Fall

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Mission and Goals of the Department of Education
Rooted in the Jesuit tradition at Santa Clara University, the mission of the Department of Education is to prepare professionals of competence, conscience, and compassion who will promote the common good as they transform lives, schools, and communities. Our core values of reflective practice, scholarship, diversity, ethical conduct, social justice, and collaboration guide both theory and practice.

Faculty, staff, and students in the Department of Education:

- Make student learning our central focus
- Engage continuously in reflective and scholarly practice
- Value diversity
- Become leaders who model ethical conduct and a commitment to social justice
- Seek collaboration with others in reaching these goals

MS/SS Teaching Credential Program Learning Goals (PLGs)
The PLGs represent our commitment to individuals who earn their MS/SS credential at Santa Clara University. The MS/SS faculty focus on ensuring each student will begin their teaching career ready to:

1. Maximize learning for every student.
2. Teach for student understanding.
3. Make evidence-based instructional decisions informed by student assessment data.
4. Improve your practice through critical reflection and collaboration.
5. Create productive, supportive learning environments.
6. Apply ethical principles to your professional decision-making

The PLGs guide our program. Therefore, all MS/SS teaching credential program course objectives are cross-referenced with the PLGs. (A fully elaborated version of the MS/SS PLGs can be found in the Teacher Candidate Handbook, Pre-Service Pathway.)

Course Description

EDU259A (Elementary Math Methods) course is Part 1 of a two-course sequence in elementary mathematics teaching methods. This sequence is designed to provide teacher candidates with a coherent set of experiences for mathematics teaching and learning in elementary schools. Through assigned readings, classroom discussions, content rich mathematics activities, and assignments that require data collection in your field placement, you will be supported as you make sense of how to approach the profession of teaching. Through thinking about ourselves as teachers, examining classroom culture and structure, and conducting clinical interviews on number concepts, we will set the stage for our development as elementary mathematics teachers. The course builds teacher candidate's understanding of how to organize math instruction to support the learning of students with identified disabilities.

Please note: We will adhere to the syllabus as much as possible. However, we are sensitive to the needs of the class, therefore, the syllabus is subject to change.

Course Objectives

This course will develop students' knowledge of or skills with…		***Standard/Goals Addressed***			
		DG #	***PLG #***	***TPE #***	***MMSN TPE #***
1	Examining knowledge, beliefs, and assumptions about mathematics, teaching, and students with particular attention to the impact language, culture, socio-economic status, and identified disabilities have had on mathematical learning opportunities.	2,4	4,6	6.2	1.1, 1.2, 3.1, 4.3
2	Increasing knowledge of mathematics content.	2	1	3.1	
3	Increasing theoretical knowledge and practical experience in planning, teaching, and assessing mathematics with particular attention for how modify teaching to meet the needs of diverse learners, including students with identified disabilities while maintaining the cognitive demand of tasks	1	1,2,3	1.3,2.5,3.4,3.5, 4.7,5.2,5.3	1.1, 1.2, 1.7, 2.1, 2.1 2.4, 3.1, 3.2, 4.1., 4.2, 4.3, 4.4
4	Understanding the mathematical needs of a diverse range of students, and adopting an asset-based view of students and families, particularly from populations that have traditionally been positioned as low status in mathematics classrooms	1,3	1,2,5	1.1,1.3,1.6, 3.2.3.5	1.1, 1.2, 1.7 2.1,2.4, 3.1,3.2, 4.1, 4.2, 4.3, 4.4,

	including students with identified learning disabilities.				
5	Understanding the complexities of diverse, multiple-ability classrooms while broadening your repertoire of teaching techniques to engage all students, including students with identified disabilities, in rich, complex, and multi-dimensional mathematics.	1,3	1,5	1.1,1.3,1.6, 3.2,3.5	1.1, 1.2, 1.7, 2.1, 2.4, 3.1, 3.2, 4.1., 4.2, 4.3 4.4

Required Texts
N/A

Course Requirements/Assignments
Distribution of points across assignments is as follows:

	Course/Requirements/Assignments	Points	TPE Assessed	*MMSN TPE* #
1	Math Autobiography	10	6.2	2.4; 3.1
2	Student Interviews	50	1.1,1.3,1.6, 2.5,3.2, 3.5,6.1	1.1, 1.2, 1.7, 2.1, 3.1; 4.3 2.4, 4.4, 4.5, 4.7, 5.6
3	Number Talk	60	1.3 1.8,,2.5,3.4, 4.4,4.7,5.2, 5.3 6.1	1.7, 3.1, 4.3,
4	Reading Reflections	20	2.2,6.1, 6.2	1.1, 1.2, 1.7, 3.1, 3.2, 4.3,
5	Mathematics Current Event	10	1.3,3.1	1.7, 2.4, 3.2

1. **Math Autobiography:** This assignment is to write a 'math life story' to reflect on your own experiences with mathematics as a student, and in life, and to think about how those experiences impacted your attitude towards mathematics as well as your understanding of mathematics. You will also reflect on how your own experiences may impact you work as a teacher with particular attention to how various aspects of your background (e.g., linguistic, cultural, racial, socio-economic, parental involvement, and/or identified disabilities) may have impacted your mathematical learning opportunities.Introduce MMSN 2.4, Practice 3.1; Introduce/Practice UTPE: 6.2

2. **Student Interview:** This assignment focuses on learning more about a single student in your placement class. Please focus on a student who has identified disabilities. Introduce MMSN1.1, 1.2, 1.7, 2.1, 4.4, 4.5, 4.7, 5.6,

Practice MMSN2.4, 3.1, Practice & Assess MMSN 4.3; Practice UTPE: 2.5; Introduce/Practice UTPE: 1.1, 1.3. 1.6,,3.2,3.5,6.1

There are three parts to this assignment, each having a reflection component:

- **Getting to Know You:** The goal of this part is to find out more about a student including (a) his/her interests, (b) activities s/he engages in outside of school, (c) his/her cultural and linguistic background, and (d) what s/he identifies as activities at which s/he excels. Another goal is to identify places, locations, and activities in the community that are familiar to children.
- **Addition & Subtraction Interview:** The goal of this part is to find out what the student understands about addition and subtraction, without your assistance. If a child is having difficulty with a problem, you may change the numbers or move on to a new problem type. There is no need to show students how to solve a problem.
- **Multiplication and Division Interview:** This third part is similar to the second part, but the focus is on understanding the student's thinking around multiplication and division.
- **Instructional Implications:** The final part of this assignment will reflect on what was learned from the interviews, interactions, and observations of the case study student to inform future mathematics instruction. You will create a written reflection that could be used to support a conversation with the student's parents will be created.

3. **Number Talk-** ***Signature Assignment*****:** This assignment focuses on facilitate a series of Number Talks in your class. The purpose of the Number Talk is for you to learn how to orchestrate mathematical discussion in your classrooms. This will entail identifying appropriate problems, anticipating student responses, listening to students' thinking, asking probing questions, and analyzing student strategies. In your reflection you will examine issues of status that were present (or not) while facilitating the Number Talk, with particular attention to students with identified disabilities).Introduce MMSN 1.7, Practice MMSN 3.1, Practice & Assess MMSN4.3; Practice UTPE: 2.5; Introduce/Practice UTPE: 1.1, 1.3,1.6,3.2,3.5; Introduce/Practice/Assess UTPE: 6.1

4. **Reading Reflections**: There will be four assigned individual reading reflections to complete during the quarter (5 points each). They will be posted on Camino under the Quiz tab. These reflections provide you with the opportunity to think about specific course assigned readings and how you believe they shape you as a mathematics teacher with a lens on how to support all students including students with identified disabilities. Introduce MMSN 1.1, 1.2, 1.7,, 3.2, Practice MMSN 3.1, 4.3; Introduce/Practice UTPE: 6.1, 6.2 Introduce/Practce/Assess UTPE: 6.1

5. **Mathematics Current Event:** In small groups of four, you will choose one short article of interest specific to mathematics teaching and/or student learning (including students with identified disabilities) to share with a small group of your classmates in the breakout room. I will meet with each group the week before they present their current mathematics event to review their article choice. I will discuss in our first week of class lists of potential sites to search for articles. Introduce MMSN 1.7, 3.2, Practice MMSN 2.4; Introduce/Practice UTPE:1.3; Practice UTPE: 3.1

Assessments & Grading Criteria

1. All written and oral assignments must reflect graduate-level standards. As a future teacher, you must be able to model communication skills for your students.

2. Attendance and participation in all class meetings is **required**. If you are going to be absent from class, you must email or call me to inform me of your absence. You will still be responsible for all missed content and in-class work.

3. Letter grades are assigned based on the following percentage scores:

A	94-100	**C+**	77-79
A-	90-93	**C**	74-76
B+	87-89	**C-**	70-73
B	84-86	**D+**	67-69
B-	80-83	**D**	63-66

4. Assignments done in pairs, both partners will receive the same grade, unless otherwise stated.

5. Final grades will reflect students' contributions (e.g., attendance, class discussions, quality of presentation, ability to lead discussion groups, completion and quality of course assignments), critical thinking and ability/degree to which student integrates theory, research and practice.

6. All assignments are expected on their due dates in the room where our class meets. I cannot be responsible for papers submitted at other times or in other formats. Unless we have made special arrangements beforehand, late assignments will be docked 3 points for each day past the due date that they are submitted.

Regular attendance at all class meetings is a requirement in this program. Ten points will be deducted from your final grade for the course for each class session you missed. Each of you will be granted one Emergency Release (ER) per course. Your ER excuses you from one class session with half the grade penalty (loss of 5 points instead of 10). To use your ER you must notify me by email or phone **BEFORE** class. Save your ER for medical issues, family demands, car trouble, etc.

Students will not be penalized for absences due to the observance of religious holidays that fall on our scheduled class day; please give me advance notice of these absences so I can make the necessary accommodations. All other absences are unexcused and will affect your grade.

Punctuality. Coming to class (and returning from breaks) on time is another course requirement. Your first lateness will be excused; your second lateness will cause 1 point to be deducted from your final course grade; your third lateness will cause an additional 4 points to be deducted. More than three late arrivals indicate a serious problem; this situation will be dealt with at the instructor's discretion. Attendance and punctuality are the only policies with the immediate potential to impact your course grades. Your instructor through ongoing observation and documentation gathers data documenting your adherence to the remaining policies listed here.

If an instructor has reason to feel you are not meeting all the expectations spelled out below, s/he will contact you privately to discuss the issue, to clarify the expectations as needed, and to offer his/her support in helping you reach those expectations. If your instructor does not contact you with a concern, you can assume you are satisfying these requirements. However, if you would like specific feedback on your professional conduct during the quarter, you are welcome to contact your instructor at any time and s/he will be glad to share his/her assessment with you.

As we will read about and study in this course, everyone's learning is enhanced by the quantity and quality of the interactions in the learning environment. Hence, your participation in whole class discussions, group work and pair group is essential for the success of this course.

While a class is in session, you should not engage in any activity not directly related to what is taking place in the classroom. Instructors reserve the right to ask you to close your laptop or put away some other form of technology at their discretion; when/if this occurs, please respond quickly and without protest to avoid further disruption of the class's learning. Instructors also reserve the right to ignore your inappropriate use of technology in class and simply deduct points from your final grade. If you would like more detailed clarification about the expectations regarding appropriate and inappropriate in-class technology use, please feel free to contact your instructor for further information.

Note: Points lost due to poor attendance and/or lack of punctuality will be deducted from your final grade. A student with excellent grades on assignments and other aspects of professional conduct can earn a poor course grade as a result of excessive absence or chronic lateness.

Canvas/Camino Course Management System
To access course materials and participate in On-line activities, please be sure to review Canvas (also known as Camino). Reminders, tools, readings and assignment descriptions will be made available through this on-line course management system. Your SCU username and password gets you access to Canvas.

Disability Accommodations Procedure
If you have a disability for which accommodations may be required in this class, please contact Disabilities Resources, Benson 216, http://www.scu.edu/disabilities as soon as possible to discuss your needs and register for accommodations with the University. If you have already arranged accommodations through Disabilities Resources, please discuss them with me during my office hours. Students who have medical needs related to pregnancy may also be eligible for accommodations.

While I am happy to assist you, I am unable to provide accommodations until I have received verification from Disabilities Resources. The Disabilities Resources office will work with students and faculty to arrange proctored exams for students whose accommodations include double time for exams and/or assisted technology. (Students with approved accommodations of time-and-a-half should talk with me as soon as possible). Disabilities Resources must be contacted in advance to schedule proctored examinations or to arrange other accommodations. The Disabilities Resources office would be grateful for advance notice of at least two weeks. For more information, you may contact Disabilities Resources at 408-554-4109.

Accommodations for Pregnancy and Parenting
In alignment with Title IX of the Education Amendments of 1972, and with the California Education Code, Section 66281.7, Santa Clara University provides reasonable accommodations to students who are pregnant, have recently experienced childbirth, and/or have medically related needs. Pregnant and parenting students can often arrange accommodations by working directly with their instructors, supervisors, or departments. Alternatively, a pregnant or parenting student experiencing related medical conditions may request accommodations through Disability Resources.

Discrimination and Sexual Misconduct (Title IX)
Santa Clara University upholds a zero-tolerance policy for discrimination, harassment and sexual misconduct. If you (or someone you know) have experienced discrimination or harassment, including sexual assault, domestic/dating violence, or stalking, I encourage you to tell someone promptly. For more information, please consult the University's Gender-Based Discrimination and Sexual Misconduct Policy at http://bit.ly/2ce1hBb or

contact the University's EEO and Title IX Coordinator, Belinda Guthrie, at 408-554-3043, bguthrie@scu.edu. Reports may be submitted online through https://www.scu.edu/osl/report/ or anonymously through Ethicspoint https://www.scu.edu/hr/quick-links/ethicspoint/

Academic Integrity

The University is committed to academic excellence and integrity. Students are expected to do their own work and to cite any sources they use. A student who is guilty of dishonest acts in an examination, paper, or other required work for a course, or who assists others in such acts, will receive a grade of F for the course. In addition, a student guilty of dishonest acts will be immediately dismissed from the University. Students that violate copyright laws, including those covering the copying of software programs, or who knowingly alter official academic records from this or any other institution, are subject to disciplinary action (ECP Graduate Bulletin, 2013-2014).

Course Meeting	Course Topics	Course Readings
Session 1 Sept 23rd	Introduction to Teaching & Learning Mathematics for Understanding (Part 1)	Boaler. (2015). *What's Math Got to with It?* Intro.
Session 2 Sept 30th	Introduction to Teaching & Learning Mathematics for Understanding (Part 2)	Allen & Schnell. (2016). Developing Mathematical Identities. *Teaching Mathematics in the Middle Schools.* Introduce MMSN 1.2, 1.7 ,2.1 Introduce UTPE: 1.1 Boaler (2015). *What's Math Got to with it.* Chapter 1. "What is math?" Boaler (2014). Research suggests timed tests cause math anxiety. *Teaching Children Mathematics.*
Session 3 Oct 7th	What is mathematical proficiency?	Van de Walle - Chp 2: What does it mean to learn mathematics? pp.19 Introduce MMSN 1.2 Introduce UTPE: 1.1, 1.3, 1.6, 1.7, 5.3 NRC's Adding it Up. Chapter 4. CCSS Mathematical Practices
Session 4 Oct 14th	Teaching through Problem Solving in Diverse Classrooms: Part 1 ELs & Students with Disabilities	Moschovich (2013). Guidelines for Design of Mathematics Instruction Materials for ELLs from Understanding Language. Introduce/Practice UTPE: 1.6 EL Article (TBD) - You will be assig one additional reading in Week 3. Introduce/Practice UTPE: 1.6

		Fennell (2007). What's so Special About Special Education? Everythir Introduce MMSN 1.1, 1.2, 1.7, 2.1 Yeh et al. (2020) Reimaging Inclusiv Spaces for Mathematics Learning Introduce MMSN 1.1, 1.2, 1.7, 2.1
Session 5 **Oct 21st**	Early number sense, sense making with addition and subtraction	TD - Chapter 8 *Developing early concepts and number sense.* pp. 128-144. Schwerdtfeger & Chan. (2007). *Counting Collections.* Introduce/Practice UTPE:1.3
Session 6 **Oct 28th**	Listening to student thinking - Part 1 Addition & Subtraction continued)	*Children's Mathematics Cognitively Guided Instruction* Ch. Intro-3. pp. x - 31. Feitelberg (2018). *CGI: Supporting Students to Create Their Own Mathematical Understanding* Introduce MMSN 1.1, 1.2, 1.7 Introduce/Practice UTPE: 4.4, 4.7
Session 7 **Nov 4th**	Listening to student thinking: Part 2 Multiplication & Division	*Children's Mathematics Cognitively Guided Instruction* Ch. 4. pp. 33 - 53
Session 8 **Nov 11th**	Teaching through Problem Solving in Diverse Classrooms: Part 2 Status & Competence	Cohen et al. (1999). Complex instruction: Equity in cooperative learning classrooms Introduce/Practice UTPE:1.8

		Optional Reading: *Smarter Togeth* Chapter 5 Addressing Status Issues through Lesson Design Introduce/Practice UTPE:1.8 Foegen & Dougherty (2017). *Instruction That Meets the Needs of Students With Mathematics Disabilities and Difficulties.* Introduce MMSN 1.1, 1.2, 1.7, 2.1, 4.1, 4.2, 4.3, 5.6
Session 9 **Nov 18th**	Status & Competence and Number Talks (Continued) Parents as Partners in Mathematics	*Smarter Together - Chapter 6 -* Addressing Status Issues during the Lesson Stoehr & Civil (2019) *Conversations Between Preservice Teachers and Parents: An Avenue to Transformati Mathematics Teaching* Introduce MMSN 2.4 Introduce/Practice UTPE: 6.1, 6.2
Session 10 **Dec 2nd**	Norm Setting & Assessing Student Thinking	Stoehr & Patel (2018) *Meaningful Mathematical Discussions That Mat* Practice UTPE:2.5 Jacobs et al. (2014) - *Warning Signs* Practice UTPE:2.5

Course Outline & Class Schedule
Course Plan Subject to Change

Final Interview Summary

Directions: In this final interview summary, there are two parts. Please complete the graphic organizer for each of the parts.

Part One – Next Steps: In the first part you will identify next steps for your own instruction. Based on what you learned from **all** of your interactions, observation and interviews with this child, identify ***three reasonable "next step"*** for the child in terms of mathematics instruction. More specifically, if you were to work with this child again,

what **specific problem (or set of problems)** would you like to ask next to further this child's understandings? Note that it is not sufficient to only suggest giving the child more problems. Instead, you should decide what would be the next specific problem (including particular problem structures, numbers and contexts) that you would like that child to solve. Be sure to include an explanation of what you hope to learn by posing that specific problem, and WHY this would be a reasonable problem to give the child. Your justification should be based on what you learned about the child across the multiple observations and interviews. ***Connections to ideas from course are required.***
Practice MMSN 3.1, 4.1, 4.3 Assess MMSN 4.3; Practice UTPE: 1.1, 1.3. 1.6, 2.5, 3.2,3.5,6.1

Next Steps: Describe reasonable next steps. Include specific example problem.	**Rationale for this next step:** Provide an explanation for WHY this is a reasonable next step by drawing from observations from interview. Be sure to connect to ideas from course.

Introduce/Practice UTPE: 1.1, 1.3. 1.6,,3.2,3.5,6.1; Practice UTPE:2.5

Part Two - Conversation with Parents. In part two, you will reflect on how can you use what you learned from your interviews, interactions and observations of your student to inform your mathematics instruction. Think about preparing to have a conversation with your student's parent(s) or guardian(s), in which you will share with them ***two specific examples*** of what you have learned about their child, and how you plan to use what you have learned to inform your mathematics instruction. You may also make recommendations for how the parent/guardian can support the student's mathematics learning. Practice MMSN 2.4; Introduce/Practice UTPE: 1.1, 1.3. 1.6,,3.2,3.5,6.1; Practice UTPE:2.5

Example of what you will share with parent: Describe what you have learned about the child's mathematical thinking.	**Implications for math instruction:** Describe how you plan to use what you have learned to inform your mathematics instruction and/or provide a suggestion to parents/guardians for how they might be able to support their child's learning. Be sure to provide a rationale for your recommendation and make connections to ideas from course.

Note: Be as specific as possible as you discuss the pedagogical/instructional implications of what you learned about your case study student. Your response MUST include explicit examples from the interviews and/or observations you conducted (Focal Student Interview, problem solving interview assessments, any informal observations that you have conducted over the past few weeks) to support and justify your claims/teaching suggestions/next steps. It is not enough to say things like, "I would give the student more math problems" or "I would make the math more fun/interesting" or "I would have the student work in groups." You must give specific reasons grounded in your learning case.

Student Interview
Final Summary Rubric

Part I Summary of Next Steps for Focal Student – Problem Design (across interviews) Practice MMSN 3.1, 4.1, 4.3 Assess MMSN 4.3 Practice UTPE: 1.1, 1.3. 1.6,,3.2,3.5,6.1; Practice UTPE:2.5	Includes rich and specific details of what the next steps math problems would be for working with the student that are responsive to the unique needs of the student's identified disability that meet the grade level requirement within the inclusive classroom environment. A complete justification is given for why these steps would be reasonable next steps. **References to course readings and ideas are relevant and support the next steps.** **9 points**	Includes moderate details of what the next steps math problems would be for working with the student that are responsive to the unique needs of the student's identified disability that meet the grade level requirement within the inclusive classroom environment. A complete justification is given for why these steps would be reasonable next steps. **References to course readings and ideas are moderate and support the next steps.** **7 points**	Includes minimal details of what the next steps math problems would be for working with the student that are responsive to the unique needs of the student's identified disability that meet the grade level requirement within the inclusive classroom environment. Minimal justification is given for why these steps would be reasonable next steps. **References to course readings and ideas are somewhat relevant and support the next steps.** **5 points**	Is lacking d what the n math prob be for wor student's i disability t responsive needs of th that meet t level requi within the classroom No justifica for why th would be n next steps. **reference readings c support th** **0 p**
Part II: Summary of Instructional	Includes thoughtful, thorough, and rich reflections on what was	Includes moderately thoughtful, thorough and rich reflections on what	Includes minimally thoughtful, thorough, and rich reflections on what	Does not in thoughtful and rich re

Implications & Parent interactions Practice/Asess MMSN 2.4 Practice UTPE: 1.1, 1.3. 1.6, 2.5,3.2,3.5, 6.1	learned from all interviews and observations. There is clear articulation of how the interviews will inform future mathematics instruction as well as future discussion with the student's parents/guardian. Included are specific and explicit examples of next steps related to student's identified disability, funds of knowledge, participation structure, and mathematical thinking that could be connected to math activities. **Examples are clearly substantiated with references to course readings and ideas.** **9 points**	was learned from all interviews. There is articulation of how the interviews will inform future mathematics instruction as well as future discussion with the student's parents/guardian. Included are specific and explicit examples of next steps related to student's identified disability, funds of knowledge, participation structure, and mathematical thinking that could be connected to math activities. **Examples are substantiated with references to course readings and ideas.** **7 points**	was learned from all interviews and observations. There is some articulation of how the interviews will inform future mathematics instruction as well as future discussion with the student's parents/guardian. Included are few specific and explicit examples of next steps related to the student's identified disability, funds of knowledge, participation structure, and mathematical thinking that could be connected to math activities. **Examples are somewhat substantiated with references to course readings and ideas.** **5 points**	what was l all intervie observatio no articula the intervi inform futu mathemat as well as f discussion student's parents/gu steps relat identified student's f knowledge participati are missin **are not su** **with refer** **course rea** **ideas.** **0 p**
Academic Writing	Writing is clear, and free of spelling and grammatical errors. Paper is well organized and easy to follow. **2 points**	Writing is free of spelling and grammatical errors, but has occasional lapses in clarity and/or organization, OR occasional errors in spelling and/or grammar. **1 point**	Writing has occasional errors in spelling and/or grammar, and has at least one sentence/idea that is lacking in clarity. **0.5 points**	Writing in multiple sp grammatic is generall **0 p**

Number Talk Assignment

What to do:

1. **Pick Problems & Dates to Implement:** Choose one dot card and two other problems you will do with your students. You must do the number to talk with a group that has *at least 5 students.* We would prefer that the number talks be done over ***at least two sessions*** in the same class. Be sure to ***start with a dot card talk***. This will help establish norms and allow you to teach the students proper etiquette.

Dot card*	Dot card*	Dot card*	Dot card*
Ten frame (see attached)	Ten frame (see attached)	Ten frame (see attached)	56 – 19
	8 + 5	56 – 19	123 + 79
	6 + 7	31 + 19	432 – 135
	15 – 9	15 + 16	8 x 15
	41 – 18	22 – 9	12 x 15 (good to do if students have several methods for 8x15)
	36 + 16	44 – 16	
	28 – 11	23 + 48	6 x 25 (good to do if students DON'T have several methods for 8x15)
	31 + 19	13 + 14 + 7	

* Dot card is required. Print page from Camino.

2. **Complete Planning Sheet:** Fill in one planning sheet (the one we used in class) for each problem in detail (legibly, please!)
   - Anticipated student responses
   - A list of possible questions you will use to probe student thinking
   - Ways of recording solutions to reflect what the student is thinking
   - How you will address issues that might arise

3. **Conduct the number talk:** With a small group of students or your entire class conduct the number talk. Be sure to introduce "silent thumbs" and record student strategies. **Take a picture** of the board for your records.

4. **Memo:** As soon as you do the number talk, write a quick "memo," jotting down your thoughts and reactions. This is not a formal reflection – it is just a way to capture your thoughts immediately afterwards.

5. **Formal Write-Up* (6-8 pages, double spaced):** Write a formal reflection of <u>your</u> number talk. Be sure to address the following questions:

   a. **Planning:**
      i. Why did you pick the particular problems?
      ii. What misconceptions did you anticipate students would have?
      iii. How will you support English Learners and students with identified disabilities. What adaptations and modifications will you make?MMSN 1.1, 1.2, 1.7, 2.1. 4.2)
Practice UTPE: 1.1, 1.3,1. 2.5, 6,3.2,3.5; Practice/Assess UTPE: 6.1

   b. **During:**
      i. What happened during the number talks?
      ii. What worked well during the number?
      iii. What was challenging during the number talk?
      iv. What surprised you during the number talk?
   c. **Student Thinking – Analyze for *<u>each</u>* number talk problem:**
      i. What strategies did students use when solving the problem?
      ii. Did any misconceptions arise during the number talk? If, so describe them?
      iii. What were some connections between students' strategies during the number talk?
   d. **Connection to Classroom Culture and Norms:**
      i. How do you think the norms and culture of your classroom influenced the implementation of the number talk? (For example, are students in your class used to sharing strategies?

What kind of math is valued in your classroom? Is math mostly conceptual, or procedural, or a combo of both?)

ii. How did issues of status manifest in your facilitation of the Number Talk? Pay particularly attention to English Learners and students with identified disabilities. (Practice Assess MMSN 6.3) Practice UTPE: 1.1, 1.3,1. 2.5, 6,3.2,3.5; Practice/Assess UTPE: 6.1

e. **Next Steps:**

i. What problem might you pose for the next number talk? Why would you choose these problems?

ii. What would you do the same/differently in your next number talk? Why?

iii. What have you learned by doing the number talks?

* *Be specific in your descriptions and be sure to reference ideas from the readings and from the course in your write-up.*

TURN IN:

- Your planning documents (scanning/taking picture and embedding in Word document is fine)
- Your memos
- Formal Write Up (typed, double-spaced, 6-8 pages).
- Due 11/4/19 by 11:00pm

Tips and Suggestions

1. Remind students about using "quiet thumbs."

2. Make sure to elicit and write on board ALL answers before asking for strategies.

3. Some ideas for questions
   - "Who has an answer/strategy they are willing to share?"
   - "Who has a different answer?"
   - "Who would like to defend one of the answers?" "_____, which answer would you like to defend?"
   - "Who can explain _____'s strategy in your own words?"
   - "So, Julia, it sounds like your strategy is similar to Charlotte's. She did [*x*] while you did [*y*].
   - "Who can explain why Sabrina [multiplied by 2]?"

Don't forget: we are not showing kids how to do anything.
If you don't know what a student is doing or you don't think this method is going anywhere, you can say, "I am still thinking about your method and I will get back to you later about it."

4. Slippery Slopes:

- Be careful not to put words into a student's mouth; as hard as it may be, elicit his or her thinking by waiting and/or probing.
- Be careful not to "help" students by doing their thinking for them – even though it is what they will expect you to do.
- "Great answer!" "Right." "Good." "Awesome." (We will talk more about praise in future C&I classes.)

5. When recording, be sure not to violate the equals sign! e.g, 10 x 3 = 30 + 6 = 36

   - Don't be in a rush to use 3 5 or 3(5) instead of 3 x 5. Symbolic notation can interfere with thinking. Use these more sophisticated symbols only when you are sure that your class is comfortable with them.
   - Similarly, don't be in a rush to introduce grouping symbols; e.g., for 6 x 12, if a student says, "6 times 10 is 60 and 6 times 2 is twelve; 60 plus 12 is 72," don't record it (yet) like this:

     6 x 12 = 6 x (10 + 2) = (6 x 10) + (6 x 2) = 60 + 12 = 72

[*Note: Symbolic notation (operations symbols, grouping symbols, m for slope, etc.) is an example of what Piaget called "social knowledge." These symbols are socially agreed-upon, not "constructed" in the mind of the learner through the understanding of mathematical relationships. Quantities and mathematical relationships what we are developing in number talks; increasingly sophisticated notation can come later.*]

Planning a Number Talk

Anticipate different methods (including misconceptions) students might use for solving the problem	Plan how you will record student methods (for each strategy on left, think about how you will record it)

Generate the kinds of questions you will need to be prepared to ask to fully understand and represent a student's method	Think about what you might do if very few strategies emerge, if there are wrong answers, etc.

Number Talk

Grading Rubric

Component and Standard	Exceeds Standards	Meets Standards	Approaches Standards	Does Not Meet Standards

Reflection on Planning (Asesss MMSN 1.1, 1.2, 1.7, 2.1. 4.2, 4.3) Assess UTPE: 6.1	Includes clear and thoughtful rationale for selecting particular problems. Potential misconceptions are clearly described. Descriptions are detailed and rationales are thoroughly explained. Clearly describes modifications and adaptations for English learners and students with identified disabilities. **5 points**	Includes clear and thoughtful rationale for selecting particular problems. Potential misconceptions are described. Descriptions include some amount of detail and rationales are moderately explained. Describes modifications and adaptations for English learners and students with identified disabilities. **4 points**	Includes some rationale for selecting particular problems. Potential misconceptions are mentioned. Descriptions lack detail and rationales are explained minimally. Minimally describes modifications and adaptations for English learners and students with identified disabilities. **2.5 points**	Does not include rationale for selecting particular problems or potential misconceptions. Does not describe modifications and adaptations for English learners and/or students with identified disabilities. **0 points**

Reflection on Implementation (Assess MMSN 6.3) Assess UTPE: 6.1	Description provides specific examples of what occurred during the number talk. Includes thoughtful and detailed reflections on what worked well, what was challenging, and what was surprising during the number talk. Description thoroughly addresses how and if Number Talks fit into or align with existing classroom culture, norms and learning experiences. Clearly addresses how issues of status manifest in your facilitation of the Number Talk with specific attention to English Learners and students with identified disabilities. **10 points**	Description provides specific examples of what occurred during the number talk. Includes thoughtful and moderately detailed reflections on what worked well, what was challenging, and what was surprising during the number talk. Description moderately addresses how and if Number Talks fit into or align with existing classroom culture, norms and learning experiences. Addresses how issues of status manifest in your facilitation of the Number Talk with specific attention to English Learners and students with identified disabilities. **8 points**	Description provides examples of what occurred during the number talk. Reflections on what worked well, what was challenging, and what was surprising during the number talk are brief and lacking in detail. Description minimally addresses how and if Number Talks fit into or align with existing classroom culture, norms and learning experiences. Minimally addresses how issues of status manifest in your facilitation of the Number Talk with some attention to English Learners and students with identified disabilities. **5 points**	Description provides examples of what occurred during the number talk. Does not include reflections on what worked well, what was challenging, and what was surprising. Does not address how Number Talks fit into existing classroom culture, norms and learning experiences. Does not address how issues of status manifest in your facilitation of the Number Talk. **0 points**

Analysis of Student Mathematical Thinking Problem #1	Description includes rich details about how all students solved each specific problem, the strategies the students used, and/or the level of thinking and mathematical understanding that is evidenced. Draws clear connections between students' mathematical strategies. **5 points**	Description includes moderate details about how the students solved each specific problem. When appropriate, description names the strategy used, and/or the level of thinking and mathematical understanding evidenced. Draws moderate connections between students' mathematical strategies. **4 points**	Description includes details about how the students solved specific problems, but description is lacking in detail, categorization, or justification. Draws minimal connection between students' mathematical strategies. **2.5 points**	Description narrates how students solved sample problems, but description of student strategies are brief and generally lacking in detail. Does not draw connections between students' mathematical strategies. **0 points**

Analysis of Student Mathematical Thinking Problem #2	Description includes rich details about how the students solved each specific problem, the strategies the student used, and/or the level of thinking and mathematical understanding that is evidenced. Draws clear connections between students' mathematical strategies. **5 points**	Description includes some details about how the students solved each specific problem. When appropriate, description names the strategy used, and/or the level of thinking and mathematical understanding evidenced. Draws moderate connections between students' mathematical strategies. **4 points**	Description includes details about how the students solved specific problems, but description is lacking in detail, categorization, or justification. Draws minimal connection between students' mathematical strategies. **2.5 points**	Description narrates how students solved sample problems, but description of students' strategies are brief and generally lacking in detail. Does not draw connections between students' mathematical strategies. **0 points**

Analysis of Student Mathematical Thinking Problem #3	Description includes rich details about how the students solved each specific problem, the strategies the students used, and/or the level of thinking and mathematical understanding that is evidenced. Draws clear connections between students' mathematical strategies. **5 points**	Description includes some details about how the students solved each specific problem. When appropriate, description names the strategy used, and/or the level of thinking and mathematical understanding evidenced. Draws moderate connections between students' mathematical strategies. **4 points**	Description includes details about how the students solved specific problems, but description is lacking in detail, categorization, or justification. Draws minimal connection between students' mathematical strategies. **2.5 points**	Description narrates how students solved sample problems, but description of students' strategies are brief and generally lacking in detail. Does not draw connections between students' mathematical strategies. **0 points**

Next Steps (Asesss MMSN 4.3, 4.4) Assess UTPE: 6.1	Includes thoughtful and rich reflection and rationale for next steps related to mathematics instruction that addresses the needs of all students including English Learners and students with identified disabilities. Reflection attends to at least three rich examples of what teacher anticipates doing next including identifying short and long-term goals that are responsive to the unique needs of students with disabilities that meets the level of requirements of the core math curriculum to promote academic achievement within inclusive environments. **10 points**	Includes thoughtful and moderate reflection and rationale for next steps related to mathematics instruction that addresses the needs of all students including English Learners and students with identified disabilities. Reflection attends to at least three examples of what teacher anticipates doing next including identifying short and long-term goals that are responsive to the unique needs of students with disabilities that meets the level of requirements of the core math curriculum to promote academic achievement within inclusive environments. These examples are moderate in detail. **8 points**	Includes reflection on next steps related to mathematics instruction that addresses the needs of all students including English Learners and students with identified disabilities.. Reflection attends to fewer than three examples of what teacher anticipates doing next including identifying short and long-term goals that are responsive to the unique needs of students with disabilities that meets the level of requirements of the core math curriculum to promote academic achievement within inclusive environments. These examples are minimal in detail. **5 points**	Does not attend to next steps. **0 points**

Planning Documents	Planning documents are completed and turned in with description of students' strategies, misconceptions and next steps thoroughly explained. **5 points**	Planning documents are completed and turned in with description of students' strategies, misconceptions and next steps are explained in moderate detail. **4 points**	Planning documents are completed and turned in with description of student's strategy, misconceptions and next steps are explained in minima detail. **2.5 points**	Planning documents are not turned in. **0 points**
Connection to course readings and ideas	Draws on specific examples and key ideas from course readings to support the claims made. Connections to reading are well founded and relevant to author's argument. Connections are made throughout the write-up. **10 points**	Draws on specific examples and key ideas from course readings to support the claims made. Connections to readings are mostly relevant to author's argument. Connections are made throughout the write-up. **8 points**	Draws minimally on specific examples and key ideas from course readings to support the claims made. Connections to readings are not relevant to author's argument. **5 points**	No connections to course readings. **0 points**

Academic Writing	Writing is clear, and free of spelling and grammatical errors. Paper is well organized and easy to follow. **5 points**	Writing is free of spelling and grammatical errors, but has occasional lapses in clarity and/or organization, OR occasional errors in spelling and/or grammar. **4 points**	Writing has occasional errors in spelling and/or grammar, and has at least one sentence/idea that is lacking in clarity. **2.5 points**	Writing includes multiple spelling and or grammatical errors, and is generally unclear. **0 points**