CALIFORNIA STATE UNIVERSITY NORTHRIDGE
Department of Secondary Education

S ED 525 MA and MAL
Methods for Teaching Secondary Mathematics
Fall 2025

Instructor: Ivan Cheng   Office Hours: By appointment only
Office: ED 2126
Instructor Phone: (818) 674-3018   Website: https://canvas.csun.edu/courses/153485
Email: icheng@csun.edu

Textbook and Resources

Required: Leinwand, S., Brahier, D., & Hunker, D. (2014). *Principles to Actions: Ensuring Mathematical Success for All*. Reston, VA: National Council of Teachers of Mathematics.

Resources: Liljedahl, P. (2021). *Building Thinking Classrooms in Mathematics: 14 Teaching Practices for Enhancing Learning*. Thousand Oaks, CA: Corwin.

edTPA Secondary Mathematics Assessment Handbook
https://drive.google.com/file/d/1sHPKsfmHaw89HAl4S9dQHFbjVdQoJW3a/view?usp=sharing

California Common Core State Standards
http://www.cde.ca.gov/be/st/ss/documents/ccssmathstandardaug2013.pdf

Conceptual Framework

The faculty of the Michael D. Eisner College of Education, regionally focused and nationally recognized, is committed to excellence, innovation, and social justice. **Excellence** includes the acquisition of professional dispositions, skills, and research-based knowledge, and is demonstrated by the development of ethical and caring professionals—faculty, staff, candidates—and those they serve. **Innovation** occurs through the leadership and commitment of faculty, and through collaborative partnerships among communities of diverse learners who engage in creative and reflective thinking. We are dedicated to promoting **social justice** and becoming agents of change in schools and our communities. We continually strive to achieve the following competencies and values that form the foundation of the Conceptual Framework.

- We value academic excellence in the acquisition of research-based professional knowledge and skills.
- We strive to positively impact schools and communities. Therefore, we foster a culture of evidence to determine the impact of our programs, to monitor candidate growth, and to inform ongoing program and unit improvement.
- We value ethical practice and what it means to become ethical and caring professionals.
- We value collaborative partnerships within the Michael D. Eisner College of Education as well as across disciplines with other CSUN faculty, P–12 educators and related professionals, and other members of regional and national educational and service communities.
- We value people from diverse backgrounds and experiences and are dedicated to addressing the varied strengths, interests, and needs of communities of diverse learners.
- We value creative, critical, and reflective thinking and practice.

Course Description

This teaching-methods course addresses strategies for planning instruction, using instructional technologies, developing disciplinary literacy, assessing student performance, and implementing effective learning experiences for all students in secondary (grades 6-12) mathematics. This course emphasizes pedagogies that are inclusive and equitable for diverse student populations. Activities in the course focus on instruction of the California curriculum standards, guided by the *Mathematics Framework for California Public Schools*.

Course Schedule

Week 1	August 27
Area of Focus	**Overview of teaching and learning mathematics in the age of AI**
Class Activities	• Explore assumptions and expectations in teaching in the current context (MS/SS 6.7) • Examine the need for teaching math for equity and social justice (MS/SS 2.3) • Address the need for "Teaching 3.0"
Preparing for Next Class	*Read Principles to Actions pp. 7–12, 42–48 and write a reflection (**due September 3**)*
Week 2	**September 3**
Area of Focus	**Promoting mathematical understandings** (edTPA Rubric 1)
Class Activities	• Review Common Core State Standards for Mathematics (MS/SS 3.1) • Examine the DSF stages of learning • Building conceptual understanding to promote equity in learning math • Examine "AFTL" activities that promote thinking and reasoning
Preparing for Next Class	*Read Principles to Actions pp. 12–16, 17–24 and write a reflection (**due September 10**)*
Week 3	**September 10**
Area of Focus	**Promoting reasoning and problem solving** (edTPA Rubrics 2, 3)
Class Activities	• Understand learning goals and the cognitive demand of tasks • Explore sample "guided sense making" (GSM) activities to promote equity (MS/SS 4.3) • Examine GSM activities on proportional relationships and slope
Preparing for Next Class	*Read Principles to Actions pp. 24–29, 48–52 and write a reflection (**due September 17**)*
Week 4	**September 17**
Area of Focus	**Using multiple representations to support learning** (edTPA Rubric 9)
Class Activities	• Supporting productive struggle by promoting a growth mindset • Examples of multiple representations (e.g., graphical, tabular, symbolic) (MS/SS 3.4) • Examine the use of multiple representations (MR) in SBAC Task Models • Using technology to promote MR (e.g., Desmos)
Preparing for Next Class	*Design a "guided sense making" (GSM) __activity__ based on SBAC Task Models (**due September 24**)*
Week 5	**September 24**
Area of Focus	**Making lessons equitable & accessible for _all_ students** (edTPA Rubrics 2, 3)
Class Activities	• Examine principles of "CLRR" and UDL to make math equitable and accessible (MS/SS 1.7, MS/SS 3.3, MS/SS 4.1, MS/SS 4.4, MS/SS, 7.3, MS/SS 7.4) • Implement UDL using low floor, high ceiling tasks • Developing "3C" hooks to promote equity and access
Preparing for Next Class	*Read "Every Student is a Mathematics Language Learner" and "ELLs Count on Language Support in Math" and write a reflection (**due October 1**)* (MS/SS 7.9)

Week 6	October 1
Area of Focus	**Supporting academic language demands** (edTPA Rubrics 3, 4)
Class Activities	• Examine ELD standards and edTPA requirements (<mark>MS/SS 7.11</mark>) • Strategies for supporting academic language development (e.g., SDAIE) • Sample activities that support the development of academic literacy
Preparing for Next Class	*Place an IM lesson into edTPA template (using either Grade 8 Unit 3, Lesson 1 OR Algebra I Unit 4, Lesson 1)* **(due October 8)**
Week 7	**October 8**
Area of Focus	**Planning and implementing effective lessons** (edTPA Rubrics 1–4, 9)
Class Activities	• Analyze edTPA lesson plans • Review key principles for designing lessons for equity and social justice • Work in teams to create a GSM lesson on linear functions
Preparing for Next Class	*Create a complete "guided sense making"* **lesson** *on the topic of linear functions (e.g., slope and/or y-intercepts)* **(due October 15)**
Week 8	**October 15**
Area of Focus	**Creating a positive learning environment** (edTPA Rubric 6)
Class Activities	• Introduce equitable teaching practices that promote collaboration (<mark>MS/SS 4.7</mark>) • Guidelines and strategies for implementing group work (<mark>MS/SS 2.5</mark>, <mark>MS/SS 2.6</mark>) • Tasks that promote collaboration and agency (e.g., WODB, card sort)
Preparing for Next Class	*Read "Navigating the Uncertainty of Sharing Mathematical Authority" and write a reflection* **(due October 22)**
Week 9	**October 22**
Area of Focus	**Engaging students through meaningful tasks** (edTPA Rubric 7)
Class Activities	• Promoting student autonomy by sharing mathematical authority • Barbie Bungee Jump activity • Tasks that deepen and extend understanding (e.g., Open Middle, 3-Act)
Preparing for Next Class	*Read* Principles to Actions *pp. 29–35, 35–41 and write a reflection (due* **October 29)**
Week 10	**October 29**
Area of Focus	**Deepening student learning through discourse** (edTPA Rubric 8)
Class Activities	• Discuss how to promote student voice, orchestrate discussions (<mark>MS/SS 7.7</mark>, <mark>MS/SS 7.8</mark>) • Strategies to promote meaningful discourse • Using effective questions to *assess* and *advance* student thinking
Preparing for Next Class	*Read* Principles to Actions *pp. 53–56 and write a reflection* **(due November 5)**
Week 11	**November 5**
Area of Focus	**Collecting evidence of student learning** (edTPA Rubric 5)
Class Activities	• Examine types of evidence collection (e.g., formative versus summative) • Explore Smarter Balanced Blueprints and Item Specifications • Analyze sample assessments and equitable assessment practices • Identify evaluative criteria for linear functions (criteria chart)
Preparing for Next Class	*Write a test and commentary based on the topic of linear functions* **(due November 12)**

Week 12	November 12
Area of Focus	**Using evidence to inform instruction** (edTPA Rubrics 11–15)
Class Activities	• Peer review of test and commentary on linear functions • Explore practical strategies for "standards-based grading" (SBG) • Discuss how to design "SBG" or "EGI" rubrics and scoring guides • Discuss strategies for providing feedback to students (<mark>MS/SS 5.5</mark>)
Preparing for Next Class	*Create and <u>present</u> a "guided sense making" (GSM) <u>**lesson**</u> (**due November 19**)*
Week 13	**November 19**
Area of Focus	**Analyzing teaching effectiveness** (edTPA Rubric 10)
Class Activities	• Review key features of effective learning activities that promote equity • Review feedback on tests and commentaries on linear functions • Begin student presentations of a **GSM** lesson
Preparing for Next Class	*Revise test and commentary on linear functions (**due December 3**)*
Week 14	**No Class November 26 (Thanksgiving Break)**
Week 15	**December 3**
Area of Focus	**Reflections on teaching and learning**
Class Activities	• Discuss important lessons learned from readings and class activities • Revisit Teaching 3.0 and examine implications for social justice teaching • Continue student presentations of a **GSM** lesson
Preparing for Next Class	*Write a reflection of what was learned this semester (**due December 10**)*
Week 16	**December 10**
Area of Focus	**Professionalism and pedagogy for teaching all learners**
Class Activities	• Discuss rofessional obligations, professional competence, professional growth • Implications of teaching for social justice for various stakeholders • Conclude student presentations of a **GSM** lesson

Professional Responsibilities

This course emphasizes learning through participation. You need to experience activities as a learner to better understand the position of the students you teach. The course also includes discussions of many important issues in mathematics education that will impact your career. Out of respect for your classmates, please arrive a few minutes early (if possible) in order to be prepared to participate in class activities. Hopefully you will not need to miss a class. However, if a situation forces you to miss one evening, you must notify the instructor and make arrangements for a makeup assignment. If you have special circumstances that might affect your attendance during the semester, special arrangements can be made on an individual basis. Finally, while all assignments can be revised for a higher score, *late submissions are not eligible*.

Standards-Based Grading

The grade will be based on the California Teaching Performance Expectations (TPEs, 2016). Some items are used to assess multiple TPEs. The scoring for each criterion is identified below.

Level 2 = Clear, solid evidence **Level 1** = Some, limited evidence **Level 0** = Minimal or no evidence

Criteria for Grades	A	A–	B+	B	B–	C+	C
Fulfil professional responsibilities by completing reflections							1
Fulfill professional responsibilities through participation in class							1
Design a GSM activity based on SBAC Task Models							1
Complete an edTPA template using a lesson from *Illustrative Mathematics*							1
Create a full GSM lesson to present in class							1
Class presentation of a GSM lesson							1
Design an effective test on linear functions							1
Write a commentary explaining the choices for the design of the test							1
Minimum scores required for each grade	**14**	**13**	**12**	**11**	**10**	**9**	**8**

Note: While all assignments can be revised for a higher score, late submissions are ***not*** eligible.

Description of Major Assignments

Reading Reflections (MS/SS 6.1)**.** For each reflection, use examples and supporting details to thoroughly and thoughtfully answer the following questions:

1) What were the most important ideas presented by the author(s)?
2) Which passages seemed particularly meaningful to you and why were they meaningful?
3) How might you apply some of the main ideas to your own teaching practice?

Guided Sense Making ACTIVITY (MS/SS 1.5, MS/SS 2.2, MS/SS 3.1, MS/SS 3.2, MS/SS 3.2)**.** Design a guided sense making ***activity*** (*not a full lesson*) that will help students explore a math concept through a process of "guided discovery." This activity must have a ***clear learning goal*** (i.e., what will the student take away from doing this activity), as well as promote reasoning and problem solving, by using and connecting ***multiple representations***. Please refer to ***SBAC Task Models*** to help you determine your learning goal and key connections that need to be made. Your activity must show an engaging mathematical ***exploration*** that allows students to ***represent*** a mathematical situation, ***analyze*** relationships, and ***connect*** various representations. Furthermore, this activity should be designed so that there are multiple possible solution paths, have a "low floor with a high ceiling," and will help address potential student misconceptions. In other words, this activity must place a high cognitive demand on students (*Principles to Actions*, p. 19). Finally, your activity should promote collaboration among students and possibly incorporate the use of technology (e.g., Desmos, Google Slide, etc.). Be sure to complete the ***GSM Activity Template*** when submitting this activity. Note: While all assignments can be revised for a higher score based on the feedback provided, late submissions are not eligible for revisions.

edTPA Lesson Plan (MS/SS 1.6, MS/SS 3.1, MS/SS 3.5, MS/SS 7.2, MS/SS 7.9)**.** The object of this assignment is for you to practice completing an *edTPA* lesson plan using a lesson from *Illustrative Mathematics* (either **Grade 8, Unit 3, Lesson 1 or Algebra I, Unit 4, Lesson 1** Be sure to study carefully the various menu items from the "**How to Use These Materials**" link (https://im.kendallhunt.com/MS/teachers/about.html or https://im.kendallhunt.com/MS/teachers/about.html) and read the various topics (e.g., about these materials, design principles, etc.) for the lesson you selected. Also, pay close attention to the **Lesson Narrative** under the PREPARATION tab for your specific lesson, as well as the **Lesson Synthesis** under the LESSON tab. Please use the official edTPA template provided to complete your lesson plan. This lesson plan will be scored based on completeness and accuracy of each component in the template.

Guided Sense Making (GSM) LESSON (MS/SS 1.1, MS/SS 1.3, MS/SS 3.3, MS/SS 3.4, MS/SS 4.4)**.** Design a full ***guided sense making lesson*** that will help students explore a math concept through a process of "guided discovery." The lesson must have a ***clear learning goal*** (i.e., what will the student take away from this lesson), as well as promote reasoning and problem solving, by using and connecting multiple representations. Your lesson must begin with an ***engaging hook*** (based on the 3Cs), followed by one or more ***activities*** appropriate for the identified stage of learning to help students make sense of the math topic being taught. You lesson plan must also include strategic questions that will *assess* and/or *advance* learning to help students ***represent***, ***analyze*** and ***connect*** concepts and procedures. This lesson should be designed so that there is a "low floor with a high ceiling" with various supports to make the lesson accessible for *all* students while placing a high cognitive demand on students (*Principles to Actions*, p. 19). Finally, your lesson must contain formative assessments to monitor student learning throughout the lesson, including an ***exit ticket*** at the end of the lesson. Be sure to complete the ***GSM Lesson Template*** and attach any PowerPoint slides or handouts that you might use in the lesson. This lesson plan must be complete and clearly written so that another teacher can actually implement the lesson based on what you have provided.

The scoring guide for the ***GSM Lesson Plan*** is as follows:

0 = Minimal or no evidence   1 = Some evidence   2 = Clear, solid evidence

Required Elements in a Lesson Plan	0	1	2
1. Appropriate content standard(s) are matched with the focus of the lesson.			
2. Clear learning goal(s) and objective(s) specify what students will learn and take away.			
3. Relevant situation or CLRR context is used as a "hook" to motivate students to engage.			
4. ***Lesson activities guide sense making rather than mimicking a procedure***.			
5. Lesson activities provide multiple connections and/or applications.			
6. Lesson activities are strategically selected and sequenced.			
7. Various instructional strategies and/or tools are used intentionally and appropriately.			
8. Strategic questions are used to assess *and* advance reasoning and critical thinking.			
9. Formative assessments are used to monitor students' understanding in multiple ways.			
10. Embedded supports address learning needs to provide access for *all* students.			

Presentation of a GSM Lesson (MS/SS 1.4, MS/SS 1.5, MS/SS 3.6, MS/SS 4.7, MS/SS 7.8)**.** The object of this assignment is for you to demonstrate your ability to ***"teach"*** an actual lesson (see above). You will ***demonstrate*** how you will implement this lesson to a middle school or high school class. The time limit for your presentation is 15 minutes; so, you might need to just describe some portions of the lesson, while ***teaching*** other parts of the lesson as you would with actual students. You must clearly describe the class or grade level for which this lesson was developed, as well as the topical unit in which the lesson is placed. Be sure to announce your ***specific learning goal(s)*** of this lesson, based on specific *California* Common Core Standard(s) for Mathematics. Finally, as a part of your presentation, you must ***explain*** how students might reach your intended learning goal(s) and your design decisions for different parts of your lesson. The scoring guide for the GSM lesson presentation is as follows:

0 = Minimal or no evidence   1 = Some evidence   2 = Clear, solid evidence

Required Elements in the Presentation	0	1	2
1. Specific learning goal(s) and takeaway(s) are clearly articulated			
2. Clear directions provided for engagement in lesson activities			
3. "Students" (i.e., class members) are actively engaged			
4. Good questions are asked using good questioning techniques			
5. Pacing is good (i.e., not rushed or too slow)			
6. Pleasant manner and voice in the presenter's delivery			
7. Eye contact is maintained with the audience			
8. Presentation is well prepared and within the time limits			

Test on Linear Functions with Commentary (MS/SS 1.8, MS/SS 5.1, MS/SS 5.3)*.* Design a ***written test*** on topics in linear functions (using the ***Test Planning Form***). The test "instrument" shall consist of both "selected response" (i.e., multiple-choice) and "constructed response" items. In addition, problems could also include matching, true-false, and solving by pictorial, graphical, or written methods. Provide an ***answer key*** and ***scoring guide or rubric*** for grading the test, showing the point distribution for partial understanding and expected correct answers. In the ***commentary*** portion, explain your thinking for why you designed the test in the way that you did, and specify the ***possible errors*** that each problem should detect, including your thinking for the design of each "distractor" in selected response problems.

0 = Minimal or no evidence   1 = Some evidence   2 = Clear, solid evidence

Assessment Instrument (Test)	0	1	2
1. Problems are well matched to the stated objective(s) and standard(s)			
2. Problems go beyond basic understandings to provide evidence of student understandings			
Procedural understanding			
Conceptual understanding			
Mathematical reasoning			
Problem-solving skills			
3. Various item types are used (e.g., SR, CR, ER, True-False, etc.)			
4. Understanding is assessed in multiple directions (stimulus/prompt)			
5. Answer key and scoring guide has breakdown for partial credit			
Assessment Commentary	**0**	**1**	**2**
1. Objective(s) and standard(s) match the actual test items			
2. Explanations are provided for design choices for each item			
3. *Specific* misconceptions or possible errors are identified			
4. Accommodations or modifications are made for special needs			

Semester Reflection (MS/SS 6.2)*.* For the ***semester reflection***, describe some of the most important things you learned in this course. Describe some things that you would still like to learn more about. Describe how this course has affected you. Describe your vision for yourself as a teacher. Cite some educational theory that you find particularly meaningful. Describe some ways your understanding of educational theory *agrees with* or *conflicts with* your understanding of actual teaching practice.

Description of Major Class Activities
(Key activities that illustrate how TPEs are introduced, practiced, or assessed)

Week 4
Supporting productive struggle by promoting a growth mindset (MS/SS 2.2)
- Discussion of assigned reading (*Principles to Actions*, pp. 24–29, 48–52)
  - What are the benefits and challenges of using multiple representations?
  - What does it mean to support "productive struggle"? What were some strategies described for doing that?
- Compare sample tasks as a whole class
  - First individually do textbook sample from GoMath 8, p. 98
  - Analyze Field Trip Problem (https://tinyurl.com/fieldtripintercept)

Using technology to promote the use of multiple representations (MS/SS 3.6, MS/SS 3.6, MS/SS 3.7, MS/SS 3.8, MS/SS 4.8, MS/SS 4.8)
- Analyze tasks that use representations (and technology)
  - What were the key design features of the activities?
  - How were representations used to promote understanding?
  - How were the activities structured to make connections to students' prior academic learning?
  - How did the activities promote the learning of concepts, procedures, mathematical reasoning, and problem solving?
- Review TPE elements and ISTE Standards for using technology
- Analyze sample Desmos activity (Square Tango) for key features
- Experience sample card sort activity using Desmos
  - What kinds of interactions can take place with this activity?
- Create a card sort activity in Desmos and share

Week 5
Implement UDL using low floor, high ceiling tasks (MS/SS 1.1, MS/SS 4.4)
- Review guidelines for Universal Design for Learning (UDL) (http://udlguidelines.cast.org/)
- Analyze a UDL activity (https://tinyurl.com/interpretingfunctions)
  - What were students asked to do in the activity?
  - What made the activity intuitive and accessible?

Developing "3C" hooks to promote equity and access (MS/SS 1.3, MS/SS 1.3, MS/SS 3.3, MS/SS 7.3, MS/SS 7.4)
- Analyze design features of Mi Familia Crest Project and Mi Familia's Recipes
- Create memes for cultural connections, including student culture
- Analyze examples of lessons that explore concern for a cause
- Collaborate to create a "3C" "appetizer" (warm up activity)
  - Come up with an idea for a "C" per small group
  - Share out ideas

Week 6
Strategies for supporting academic language development (MS/SS 1.6, MS/SS 7.2)
- Brainstorm math activities that have language DEMANDS
  - Language functions
    - Connect with Common Core Standards for Mathematical Practice
    - Identify various sources of language demands (e.g., word problems)

o   Vocabulary and syntax
o   Discourse (i.e., oral and text structures for communicating mathematical ideas)
o   Syntax (i.e., rules for organizing words or symbols)

Sample activities that SUPPORT the development of academic literacy (MS/SS 3.5, MS/SS 7.2)
- Examine sample math tasks (Expressions, Word Problems, etc.)
- Discuss how to support academic language development by applying ideas in handouts (e.g., SDAIE, graphic organizers, thinking maps, etc.

Week 7
Work in teams to create a GSM lesson on linear functions (MS/SS 3.4, MS/SS 4.6)
- Review guidelines for designing effective lessons
  o   The goal is for students to generate their own process for finding solutions, rather than be shown the solution process.
- Practice using GSM lesson template for the topic of linear functions
  o   Select one or more Learning Goals
  o   Complete one lesson planning template per team
  o   This lesson will be used to guide the design of the test on linear functions

Week 8
Tasks that promote collaboration and agency (MS/SS 4.7)
- Experience sample "group-worthy" tasks (Trigonometry, Special Right Triangles, Finding Areas)
- Analyze "group-worthy" tasks
  o   What were the key design features of the activities?
  o   How were the activities structured to make connections to students' prior academic learning?
  o   How did the activities promote the learning of concepts, procedures, mathematical reasoning, and problem solving?
- Address issues of implementing group work
  o   Forming groups (random v. assigned)
  o   Grading group work
- Work on examples of Which One Doesn't Belong (WODB) as a whole class
  o   What were some key features of WODB?
  o   How is this type of activity different from other math activities?
- Work in teams to create and share WODB creations
  o   Discuss the benefits of using WODB and key practices in their implementation

Week 9
Barbie Bungee Jump activity (MS/SS 2.5, MS/SS 7.9)
- How far can you drop a water bottle without letting it hit the ground?
  o   Collect data based on experiments using different numbers of rubber bands
  o   Make a prediction for dropping it from the balcony
  o   Test your prediction to see which group can come closest to the ground without touching the ground
- Discuss take-aways from doing this activity

Week 10
Strategies to promote meaningful discourse (MS/SS 7.6, MS/SS 7.8)
- Opening activity that promotes discourse and/or questioning
  o   Examine a multiplication trick from Gyaan Manjusha (https://www.instagram.com/reel/C4IbS-hBn_A/?igsh=ZDBjMWI0ZjMxOQ%3D%3D)
  o   Discuss in small groups
    ▪   Why does it work?
    ▪   Does it work for all numbers?
    ▪   Does it work beyond x10?

- Discuss assigned reading (*Principles to Actions*, pp. 29–35, 35–41)
  - How can student thinking be used to make classroom instruction more effective?
  - What are some ways ideas are exchanged in class?
  - How can student responses be used effectively in whole-class discussions?
  - What are some ways to create a culture for discourse?
  - What are some do-s and don't-s of questioning?
- Sorting activity for selecting and sequencing student work samples*
  - Organize the student work into 3 groups and provide the criteria for each group
  - Determine which examples of student work might be selected for discussion
  - Determine a sequence for presenting the strategies and provide a rationale
- Discuss what is required in order to effectively select and sequence student work: What questions might need to be asked to advance their thinking?

Using effective questions to *assess* and *advance* student thinking (MS/SS 1.8, MS/SS 5.3)
- Discuss monitoring of student learning
  - What are some methods of monitoring you have observed?
  - What kinds of questions were asked?
  - What strategies did the teacher use to see if students actually learned?
  - What might be some pros and cons of the different strategies observed?
- Deepening student learning (maintaining "flow")
  - Encourage students to ask "keep thinking" questions
  - Ask good "focusing" questions!
- Introduce questioning types (e.g., "funneling" versus "focusing")
  - Assessing: Determine what students know or understand
  - Advancing: Move the student toward the target goal
  - (Note: GSM activities need good questions to help students notice key connections and to draw conclusions)
- Work in small groups to identify some stock questions that can be asked in class
  - Determine whether the questions are **assessing** or **advancing**
  - Groups share out questions selected
- Discuss characteristics of good questions (e.g., fostering thinking rather than fishing for the desired response) and types of questions

Week 11
Analyze sample assessments and equitable assessment practices (MS/SS 5.1, MS/SS 5.2)
- Review four types of understanding to be assessed (i.e., procedural understanding, conceptual understanding, mathematical reasoning, and problem solving)
- Analyze Sample Test Problems (from a local high school)
  - What types of understanding are being assessed (procedural, conceptual, etc.)
  - What kinds of evidence might each test item provide?
  - What does each test item tell you about students' actual understanding or misunderstandings of linear functions?
  - How are prompts structured to provide opportunities for student to show more than just the correct answer?
- Analyze SBAC Task Models and contrast with Sample Test Problems (from a local HS)
- Compile a list of essential concepts and skills that might be assessed in a test on linear functions by filling in a "Criteria Chart"
  - Examine sample problems and select problems that address key concepts and skills
  - Highlight possible "directions" for stimuli and prompts
- Create prompts and scoring rubric using the Test Planning Form
- Work together to write test items

Week 12

Discuss how to design "SBG" or "EGI" rubrics and scoring guides (<mark>MS/SS 5.3</mark>, <mark>MS/SS 5.4</mark>)

- Grade actual test (e.g., Linear Graphs from MARS)
    - Create a scoring guide / rubric
    - What are the errors or misunderstandings?
    - What are some patterns in the students' errors?
    - What might be some next steps for addressing the learning needs of students?
    - Fill out Student Learning Chart for own linear functions test (i.e., determine categories of math concepts / procedures and performance levels)
- Discussion on equitable grading practices (using hypothetical scenarios)
    - Half the class scoring 100% while the other half scored 50% versus half the class scoring 76% and the other half scoring 74% & 76%
    - Students' errors for 12 – 2 (3 – 5) and implications for teaching practice
- Introduce standards-based grading
  https://otus.com/the-ultimate-guide-to-standards-based-learning-2019/
    - Performance on standards, rather than scores on categories of assignments, determine summative course grades
    - Performance on standards, rather than the number of problems correct, determine test grades
    - Achievement/performance levels are based on clear indicators of competence
    - Final grades are based on specific criteria for levels of achievement/performance (e.g., B = "proficient" on 80% of learning targets)
    - Grades based on mastery over time, not simple averages

Week 16

Discuss professional obligations, professional competence, professional growth (<mark>MS/SS 6.5</mark>)

- Reflecting on teaching
    - What it means to teach math in 2025
    - Specialized knowledge needed
    - Important considerations for teaching
- The need for Teaching 3.0
    - What the pandemic has taught us
    - The impact of technology
    - What "HI" skill do students really need to learn? (Attention skills, analysis skills, application skills)
    - Focus of math: Quantities, relationships, representations
    - Ask first, teach later

Key Points of edTPA Rubrics

Planning Task

1. Lesson plans support the learning of facts and procedures with clear connections to concepts AND mathematical reasoning and/or problem solving.

2. Lesson plans support varied student learning needs by using knowledge of students to address specific individuals or groups with similar needs.

3. Lesson plans are justified by the knowledge of students and research and/or theory using appropriate examples of students' prior learning and their personal, cultural, or community assets.

4. Language demands (vocabulary, symbols, language function, etc.) are identified and supported.

5. Assessments are planned to monitor and support student learning by eliciting evidence of students' procedural fluency, conceptual understanding, mathematical reasoning, and problem-solving skills.

Instruction Task

6. Evidence is provided for a positive, low-risk learning environment that promotes respect.

7. Evidence is provided to show students actively engaged in tasks that develop their understanding of concepts, procedures, mathematical reasoning, and problem-solving skills.

8. Evidence is provided to show how student responses are elicited and built upon to help them develop their understanding of concepts, procedures, reasoning, and problem-solving skills.

9. The effective use of various mathematical representations provides opportunities for students to deepen their understanding of mathematical concepts and procedures.

10. Teaching effectiveness is evaluated to make changes based on students' learning needs and on research and/or theory.

Assessment Task

11. Analysis of student learning uses specific examples to identify patterns of learning (beyond what students did right or wrong) for the whole class, as well as for individuals or groups.

12. Feedback to students is specific and addresses both strengths and needs, as well as ways to improve.

13. How feedback is used by students to guide their further learning is described.

14. Analysis is provided for students' use of a language function, vocabulary and/ore symbols, as well as additional language demands (e.g., mathematical precision, discourse, syntax).

15. Analysis of assessments is used to plan next steps, including targeted support to individuals or groups, with next steps justified by research and/or theory.

Student Learning Outcomes (SLOs)

Single Subject Credential candidates will demonstrate proficiency in the California Teacher Performance Expectations (TPEs), which serve as the SLOs for the program:

TPE 1 Engaging and supporting all students in learning

TPE 2 Creating and maintaining effective environments for student learning

TPE 3 Understanding and organizing subject matter for student learning

TPE 4 Planning instruction and designing learning experiences for all students

TPE 5 Assessing student learning

TPE 6 Developing as a professional educator

TPE 7 Provide effective literacy instruction for all students.

TPE 1   Engaging and Supporting Students in Learning

Student Engagement

Beginning teachers understand and value the socioeconomic, cultural, and linguistic background, funds of knowledge, and achievement expectations of students, families, and the community and use these understandings not only within the instructional process but also to establish and maintain positive relationships in and outside the classroom. They use technology as appropriate to communicate with and support students and families.

Beginning teachers provide opportunities and adequate time for students to practice and apply what they have learned within real-world applications and community-based instruction as appropriate and as available. They use available community resources, prior student experiences, and applied learning activities, including arts integration, to make instruction individually and culturally relevant.

Beginning teachers use a variety of instructional principles and approaches such as UDL and linguistic scaffolding to assure the active and equitable participation of all students and to promote engagement of all students within general education environments using the principles of Multi-Tiered System of Supports (MTSS) as appropriate.

Language Acquisition and Development

Beginning teachers understand and apply theories, principles, and instructional practices for the comprehensive language instruction of English learners, Standard English learners, and students whose first language is English. They understand and use appropriate instructional approaches and programs for developing language proficiency and the use of academic language for English language development, including structured English immersion, integrated and designated English language development, and Standard English acquisition. They appropriately apply theories, principles, and instructional practices for English language development to assist students to achieve literacy in English. Beginning teachers understand and apply pedagogical theories and principles and practices for the development of students' academic language, comprehension, and knowledge across the subjects of the core curriculum.

Beginning teachers use a student's background and assessment of prior learning both in English and the home language, if applicable, to differentiate instruction and to select instructional materials and strategies, including the incorporation of visual and performing arts, to support the student in comprehension and production of Standard English. They are able to determine communicative intent, particularly with students at emerging and expanding English proficiency levels and with students who may have an identified disability affecting their ability to acquire Standard English proficiency.

Beginning teachers design and implement instruction based on the student's level of English proficiency and academic achievement, keeping in mind that the student's individual needs vary and may be multifaceted. Additionally, beginning teachers understand the difference among students whose only instructional need is to acquire Standard English proficiency, students who may have an identified disability affecting their ability to acquire Standard English proficiency, and students who may have both a need to acquire Standard English proficiency and an identified disability.

Beginning teachers assure that students understand what they are to do during instruction and monitor student progress toward learning goals as identified in the academic content standards and Individualized Education Plans (IEPs), Individualized Family Service Plans (IFSPs), Individualized Transition Plans (ITPs), and Section 504 plans, as applicable.

TPE 2   Creating and Maintaining Effective Environments for Student Learning

Beginning teachers create healthy learning environments by promoting positive relationships and behaviors, welcoming all students, using routines and procedures that maximize student engagement, supporting conflict resolution, and fostering students' independent and collaborative learning. Beginning teachers use a variety of strategies and approaches to create and maintain a supportive learning environment for all students. They use principles of positive behavior intervention and support processes, restorative justice and conflict resolution practices, and they implement these practices as appropriate to the developmental levels of students to provide a safe and caring classroom climate.

Beginning teachers understand the role of learners in promoting each other's learning and the importance of peer relationships in establishing a climate of learning. They encourage students to share and examine a variety of points of view during lessons. Beginning teachers support all students' mental, social-emotional, and physical health needs by fostering a safe and welcoming classroom environment where students feel they belong and feel safe to communicate. Beginning teachers recognize that in addition to individual cultural, linguistic, socioeconomic and academic backgrounds, students come to school with a wide range of life experiences that impact their readiness to learn, including adverse or traumatic childhood experiences, mental health issues, and social-emotional and physical health needs.

Beginning teachers design and maintain a fair and appropriate system of classroom management that fosters a sense of community, incorporates student input, and engages families. They regularly assess and adapt this system in response to students, families, and school contexts. Beginning teachers align their classroom management plan with students' IEP, IFSP, ITP, and 504 plans as applicable.

TPE 3   Understanding and Organizing Subject Matter for Student Learning
Subject-Specific Pedagogy* and Making Content Accessible

Beginning teachers use subject matter knowledge to plan, deliver, assess and reflect on content-specific instruction for all students, consistent with the California State Standards in the content area(s) of their credential(s). Beginning teachers provide multiple means for students to access content such as linguistic supports; technology, including assistive technology; elements of UDL; integrating other content areas, such as the arts; and accommodations and/or modifications to assessments and instruction. They also address access to content standards as specified in plans such as IEPs, IFSPs, ITPs and 504 plans. Beginning teachers design learning sequences that highlight connections, relationships, and themes across subjects and disciplines. They also engage students in real-world applications to make learning relevant and meaningful. Beginning teachers work with colleagues through collaboration and consultation to support students' engagement with instruction.

Beginning teachers also articulate and apply pedagogical theories, principles, and practices for the development of literacy, academic language, comprehension, and knowledge in the subjects of the core curriculum for all students.

Integrating Educational Technology

Beginning teachers design, implement, and evaluate technology-rich learning environments to customize and individualize learning opportunities and assessments for students. They integrate knowledge of subject matter, pedagogy, and available instructional technology tools, including assistive technology, to design learning experiences that engage and support all students in learning the California State Standards, along with improving students' conceptual understanding, cultivating their critical thinking, and promoting their creative learning.

Beginning teachers model knowledge, skills, and fluency in using digital tools. Beginning teachers teach students how to use digital tools to learn, to create new content, and to demonstrate what they are learning. Beginning teachers model and promote digital citizenship and critical digital literacy, including respecting copyright law, understanding fair use guidelines, understanding Creative Commons license, and maintaining Internet security. Beginning teachers promote equal access of all students to digital tools and assure that students are safe in their digital participation.

Beginning teachers use appropriate educational technologies to deepen teaching and learning to provide students with opportunities to participate in a digital society and economy. Beginning teachers use established learning goals and students' assessed needs to frame the choices of digital tools and instructional applications consistent with standards of the International Society for Technology in Education (ISTE) and the International Association for K–12 Online Learning (iNACOL).

TPE 4   Planning Instruction and Designing Learning Experiences for All Students

Beginning teachers access and apply knowledge of students' prior achievement and current instructional needs; knowledge of effective instructional techniques for supporting the academic language needs of all students, the specific language needs of students whose first language is English, English learners, and Standard English learners; the knowledge of effective instructional techniques for students with disabilities in the general education classroom; and knowledge of formative and/or summative student assessment results relative to the TK–12 academic content standards to improve teaching and learning for all students.

Beginning teachers are knowledgeable about typical and atypical child and adolescent abilities and disabilities and their effects on student growth and development, learning, and behavior. Beginning teachers also are knowledgeable about the range of abilities of gifted and talented students in the general education classroom.

Beginning teachers understand how to effectively use content knowledge, content pedagogy, and student learning targets to design appropriate instruction and assessment for all students. Beginning teachers demonstrate the ability to design and implement instruction and assessment that reflects the interconnectedness of academic content areas and related student skills development in literacy, mathematics, science, and other disciplines across the curriculum in alignment with California's adopted content standards and their underlying principles.

In planning for instruction consistent with California's TK–12 content standards, beginning teachers access and apply their deep content knowledge of the subject area and use appropriate content-specific pedagogy consistent with research-based practices in the field. Beginning teachers understand the principles of UDL and MTSS and apply these principles in the content field(s) of their credential(s) to plan instruction that meets individual student needs for all students. Beginning teachers align instructional goals and student learning objectives, including IEP, IFSP, ITP, and 504 plans, instructional procedures, assessment tools/processes, and criteria for evaluation of learning. They provide access to the curriculum for all students by removing barriers and providing access through a range of appropriate instructional strategies tailored and adapted as necessary to meet individual student needs.

Beginning teachers research, evaluate, and utilize current technological practices to improve teaching and learning (e.g., blended and online learning technologies).

TPE 5   Assessing Student Learning

Beginning teachers develop, implement, and use a range of effective classroom assessments to inform and improve instructional design and practice. Beginning teachers demonstrate knowledge of student assessment design principles, such as test construction, test question development, and scoring approaches, including rubric design. They explain the importance of validity and reliability in assessment and know how to mitigate potential bias in question development and in scoring. Beginning teachers demonstrate knowledge of a variety of types of assessments and their appropriate uses, including diagnostic, large-scale, norm-referenced, criterion-referenced, and teacher-developed formative and summative assessments. They effectively select and administer assessments to inform learning.

Beginning teachers use multiple measures to make an informed judgment about what a student knows and is able to do. Beginning teachers analyze data to inform instructional design, self-reflect, reteach, provide resources, and accurately document student academic and developmental progress. They support students in learning how to peer- and self-assess work using identified scoring criteria and/or rubrics. Beginning teachers provide students with opportunities to revise or reframe their work based on assessment feedback, thus leading to new learning. They implement

fair grading practices, share assessment feedback about performance in a timely way, utilize digital resources to inform instruction, analyze data, and communicate learning outcomes.

Beginning teachers utilize assessment data and collaborate with specialists to learn about their students. They apply this information to make accommodations and/or modifications of assessment for students whose first language is English, English learners, and Standard English learners. They also utilize this process for students with identified learning needs, students with disabilities, and advanced learners. Beginning teachers are informed about student information in plans such as IEPs, IFSPs, ITPs, and 504 plans and participate as appropriate.

TPE 6   Developing as a Professional Educator

Beginning teachers seek opportunities to reflect on and improve their practice through collaborative inquiry, observation feedback, and their own performance data. Beginning teachers are aware of their potential implicit and explicit biases and the potential impact, positive and/or negative, on their expectations for and relationships with students, families, and colleagues. They understand their responsibility for ongoing professional learning and for maintaining their certification as members of a profession. Throughout their preparation program, beginning teachers develop an understanding of their fundamental responsibilities as professional educators and of their accountability to students, families, colleagues, and employers. Beginning teachers participate as team members with colleagues and families. Beginning teachers take responsibility for all students' academic learning outcomes. They hold high expectations for all students.

Beginning teachers articulate and practice the profession's code of ethics and professional standards of practice, and they uphold relevant laws and policies, including but not limited to those related to:

- professional conduct and moral fitness;
- use of digital content and social media;
- education and rights of all stakeholders, including students with disabilities, English learners, and those who identify as LGBTQ+;
- privacy, health, and safety of students, families, and school professionals;
- mandated reporting; and
- students' acts of intolerance and harassment such as bullying, racism, and sexism.

Beginning teachers understand that they have chosen to become members of complex organizations. Beginning teachers are familiar with issues of equity and justice within the structures and contexts of public education, including state, district, and school governance; curriculum and standards development; testing and assessment systems; and basic school finance.

TPE 7   Effective Literacy Instruction for All Students

The credential program's coursework and supervised field experiences encompass the study of effective means of teaching literacy[1,2] across program's coursework and supervised field experiences encompass the study of effective means of teaching literacy across all disciplines based on California's State Board of Education (SBE)-adopted English Language Arts (ELA) and Literacy Standards and English Language Development (ELD) Standards. Program coursework and supervised field

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[1] Literacy comprises reading, writing, speaking, and listening; these processes are closely intertwined and should be understood to include oral, written, visual, and multimodal communication. The themes of the ELA/ELD Framework (Foundational Skills, Meaning Making, Language Development, Effective Expression, and Content Knowledge) crosscut the four strands of the ELA/literacy standards (Reading [Literature, Informational Text, Foundational Skills], Writing, Speaking and Listening, and Language) and the three parts of the ELD standards (Interacting in Meaningful Ways [Communicative Modes], Learning About How English Works [Language Processes], and Using Foundational Literacy Skills). In practice, these themes, strands, and parts are overlapping and should be integrated among themselves and across all disciplines.

[2] For students with disabilities the terms reading, writing, listening, and speaking should be broadly interpreted. For example, reading could include the use of braille, screen-reader technology, or other communication technologies or assistive devices, while writing could include the use of a scribe, computer, or speech-to-text technology. In a similar vein, speaking and listening could include American Sign Language, sign-supported speech, or other means of communication.

experiences are aligned with the current, SBE-adopted *English Language Arts/English Language Development (ELA/ELD) Framework,* including the crosscutting themes of Foundational Skills, Meaning Making, Language Development, Effective Expression, and Content Knowledge. The program emphasizes the relationships among the five themes, including the importance of the foundational skills to student learning across all themes and how progress in the other themes also supports progress in the foundational skills. Through the integration of literacy coursework and supervised clinical practice, candidates learn that student instruction in each of the themes is essential and should occur concurrently (rather than sequentially), with emphasis based on grade-level standards. Candidates also learn that for multilingual and English learner students, concurrent instruction in each of the themes through integrated and designated ELD is critical.

Grounded in Universal Design for Learning and asset-based pedagogies,[3] the program supports the development of candidates' knowledge, skills, and abilities expressed in the *Teaching Performance Expectations* to provide effective literacy instruction that is organized, comprehensive, systematic, evidence based, culturally and linguistically sustaining, and responsive to students' age and prior literacy development. Candidates learn the power of language (both oral and written) to understand and transform the world and to create and support socially just learning environments. The program also builds candidates' understanding that high-quality literacy instruction integrates all strands of the ELA/literacy standards, all parts of the ELD standards, and other disciplinary standards to develop students' capacities as effective and critical readers, writers, listeners, and speakers.

The study of high-quality literacy instruction in the program also incorporates the following elements of the *California Comprehensive State Literacy Plan*:

a) Principles of equity, diversity, and inclusion, including books and other instructional materials and practices that are asset based and culturally and linguistically responsive, affirming, and sustaining[4]

b) Multi-Tiered System of Support, including best first instruction; targeted, supplemental instruction for students whose literacy skills are not progressing as expected toward grade- level standards; and referrals for intensive intervention for individuals who have not benefited from supplemental support

c) Instruction that is responsive to individual students' age, language and literacy development, and literacy goals; that engages families and communities as educational partners; and that is reflective of social and emotional learning and trauma-informed practices

d) Incorporation of the *California Dyslexia Guidelines*

e) Integrated and designated ELD

f) Knowledge of how to promote multiliteracy in both English-medium and multilingual programs

g) Assessment for various purposes, including formative, progress monitoring, and summative literacy assessment; screening to determine students' literacy profiles, including English learner typologies, and to identify potential difficulties or disabilities in reading and writing, including risk for dyslexia; and the possible need for referrals for additional assessment and intervention

Consistent with the *ELA/ELD Framework*, candidates learn instructional practices, through coursework and supervised field experiences, that are active, motivating, and engaging. Candidates learn that effective practices begin with building on students' cultural and linguistic assets, including home languages and dialects, backgrounds, experiences, and knowledge, including family and community, in all instruction. The program makes clear the importance of creating environments that

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[3] Asset-based pedagogies view the diversity that students bring to the classroom, including culture, language, disability, socio-economic status, immigration status, and sexuality as characteristics that add value and strength to classrooms and communities.

[4] Culturally relevant pedagogy, culturally responsive teaching, culturally sustaining pedagogy, and funds of knowledge are all instructional approaches that affirm students' cultural lives—both family and community—and incorporate this knowledge into the classroom and collectively deem students' lived experiences as assets. These practices affirm the diversity that students bring to the classroom, including culture, language, disability, socio-economic status, immigration status, sexual orientation, and gender identity as characteristics that add value and strength to classrooms and communities. They include instructional approaches that leverage the cultural and linguistic experiences of students to make learning more relevant and effective.

promote students' autonomy in learning, including providing choices in reading and other literacy-related activities. Candidates learn that instructional practices vary according to students' learning profiles and goals, age, English language proficiency, and assessed strengths and needs and include, as appropriate, direct instruction, collaborative learning, and inquiry-based learning. Candidates also learn the value of guided self-assessment and goal setting for student independence, motivation, and learning.

*Pedagogical Skills for Teaching Mathematics in a Single Subject Teaching Assignment

Beginning Single Subject Mathematics teachers demonstrate knowledge of and ability to teach mathematics content aligned with the California State Standards and applicable English Language Development Standards. The interdisciplinary nature of these standards requires beginning teachers to demonstrate both the capacity and the disposition to collaborate with their colleagues to assure that all students are provided curriculum and instruction that effectively merges literacy within each content area. Beginning teachers understand the concept that English language and literacy development is a shared responsibility of all content area educators.

Beginning teachers enable students to understand basic mathematical computations, concepts, and symbols; to use them to solve common problems; and to apply them to novel problems.

Beginning teachers help students understand different mathematical topics and make connections among them.

Beginning teachers help students solve real-world problems using mathematical reasoning and concrete, verbal, symbolic, and graphic representations.

They require student collaboration and written and oral communication that demonstrates students' ability to construct logical arguments based on substantive claims, sound reasoning, and relevant evidence.

They provide students the opportunity to use and evaluate strengths and limitations of media and technology as integral tools in the classroom.

Beginning teachers provide a secure environment for taking intellectual risks, model and encourage students to use multiple ways of approaching mathematical problems, and encourage discussion of different solution strategies. They demonstrate positive attitudes toward mathematics and encourage student curiosity, flexibility, and persistence in solving mathematical problems.

Additionally, beginning teachers use developmentally appropriate and diverse strategies to engage students in grades 7–12 to understand mathematics as a logical system that includes definitions, axioms, and theorems, and to understand and use mathematical notation and advanced symbols.

They assign and assess work through progress-monitoring and summative assessments that include illustrations of student thinking, such as open-ended questions, investigations, and projects.

Beginning teachers engage students in the Standards for Mathematical Practice: 1) Make sense of problems and persevere in solving them; 2) Reason abstractly and quantitatively; 3) Construct viable arguments and critique the reasoning of others; 4) Model with mathematics; 5) Use appropriate tools strategically; 6) Attend to precision; 7) Look for and make use of structure; and 8) Look for and express regularity in repeated reasoning. Beginning teachers. assure that students at various English proficiency levels have the academic language needed to meaningfully engage in the content.

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