EED 472: Mathematics Curriculum and Methods

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Michael D. Eisner College of Education Conceptual Framework

The faculty of the Michael D. Eisner College of Education, regionally focused and nationally recognized, is committed to **Excellence through Innovation**. We believe excellence includes the acquisition of professional knowledge, skills, and dispositions and is demonstrated by the growth and renewal of ethical and caring professionals—faculty, staff, candidates—and those they serve. Innovation occurs through collaborative partnerships among communities of diverse learners who engage in creative and reflective thinking. To this end we continually strive to achieve the following competencies and values that form the foundation of the Conceptual Framework.

1. We value academic **excellence** in the acquisition of professional knowledge and skills.
2. We value the use of **evidence** for the purposes of monitoring candidate growth, determining the impact of our programs, and informing ongoing program and unit renewal. To this end we foster a culture of evidence.
3. We value ethical practice and what it means to become **ethical and caring professionals**.
4. We value **collaborative partnerships** within the College of Education as well as across disciplines with other CSUN faculty, P – 12 faculty, and other members of regional and national educational and service communities.
5. We value diversity in styles of practice and are united in a dedication to acknowledging, learning about, and addressing the various strengths, interests, and needs of **communities of diverse learners**.
6. We value **creative and reflective thinking** and practice.

Course Description

This course addresses the skills and understandings that Multiple Subject Credential candidates and Education Specialist candidates need in order to effectively plan, implement, and evaluate instructional programs in mathematics using current state-adopted standards. Designed to provide models of effective instruction consistent with our current understanding of learning processes. Candidates learn to apply research-based instructional strategies that support and challenge all learners. Candidates develop skills for teaching children of diverse cultural and linguistic heritages, developmental levels, learning styles, and special populations to ensure equal access to rigorous mathematics curricula.

Course Objectives

Teacher Performance Expectations TPE 1: Engaging and Supporting Students in Learning Making Content Accessible

1. Understand the patterns of development of students' mathematical abilities and their implications to the design of a balanced and comprehensive K-8 mathematics curriculum.

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2. Use varied instructional strategies and materials, e.g., discussion, manipulatives, physical models, graphical representations, media and technology, in a manner appropriate to the design of learning experiences that promote student motivation, computational skill, concept understanding, and problem solving abilities that address the CCSS-M.
3. Understand how to deliver a comprehensive program of rigorous instruction that includes reading, writing, speaking and listening to develop student skills in using academic language specific to mathematics and also to facilitate student interactions to develop communication skills in reasoning, constructing viable arguments, and critiquing the reasoning of others.

Student Engagement and Developmentally Appropriate Teaching Practices

4. Design daily K-8 mathematics instruction that:
   - Is developmentally appropriate to make content accessible to all students
   - Explicitly communicates the purpose and objectives of lessons to students
   - Is relevant to students' needs and interests
   - Provides for the active and equal participation of all students
   - Provides for sharing and evaluation of differing points of view
   - Extends students' thinking through stimulating questions and challenging ideas
   - Models the qualities of a secure mathematics learning environment
   - Is differentiated relative to the needs of students with atypical development
   - Extends concrete thinking and fosters abstract reasoning and problem-solving skills

Demonstrates Understanding of Appropriate Practice for English Language Learners

5. Apply pedagogical theories, principals and practices in promoting student development of mathematical academic language, comprehension, and knowledge. Candidates allow students to express mathematical meaning in a variety of ways, including in their first language, and make learning strategies explicit.

TPE 2: Creating and Maintaining Effective Environments for Student Learning

Instructional Time & Social Environment

6. Design instruction that demonstrates appropriate use of instructional time to maximize student learning, and that includes specific strategies for managing routine tasks and lesson transitions.
7. Create a positive climate for learning and a sense of community that promotes student effort by emphasizing collaborative activities and joint problem solving.

TPE 3:Understanding and Organizing Subject Matter for Student Learning

Specific Pedagogical Skills for Math Instruction

8. Facilitate the students' development of knowledge and skills to use problem solving, reasoning and proof, communication, representation, and connections in real-world situations.
9. Facilitate the application of adaptive reasoning, strategic competence, conceptual understanding, procedural fluency, and productive disposition.
10. Critically examine state-adopted K-8 Common Core State Standards in light of children's natural development of mathematical skills, concepts, and reasoning.
11. Develop critical thinking in mathematics by following the Common Core Standards for Mathematical Practices. Develop an appreciation for mathematics as a mode of thinking and a strategy of inquiry and develop positive attitudes towards mathematics and teaching of mathematics. These specific pedagogical skills are to:
    - Promote positive classroom interaction, collaboration, and written and oral communication as students construct logical arguments and sound reasoning
    - Promote student curiosity, flexibility, and persistence in problem solving

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- Encourage multiple approaches to problem solving
- Provide discussion of different problem solutions, making and testing conjectures.

TPE 4: Planning Instruction and Designing Learning Experiences for Students

Learning about Students

12. Identify and incorporate the elements and practices of a mathematics learning environment in planning the mathematics curriculum, that,
    - Establishes clear expectations for student behavior
    - Promotes intellectual risk-taking in a secure environment
    - Promotes positive attitudes towards mathematics
    - Promotes caring, respect, and fairness
    - Develops relevant, differentiated instruction based upon varied student needs, such as language, cultural backgrounds, exceptionalities, and developmental learning needs
    - Correlates learning experiences to students' cultural backgrounds, experience, and interests.

Instructional Planning

13. Demonstrate the ability to understand and teach the progression of the state-adopted K - 8 Common Core State Standards for Mathematics and strategically plan and schedule instruction to ensure that students meet or exceed the standards.
14. Identify the elements of a comprehensive instructional plan for K-8 mathematics instruction in accordance with state-adopted Common Core State Standards that:
    - Incorporates explicit models of instruction based on sound theory and research that is appropriate to the purpose and content of the lesson to help students meet or exceed grade level expectations
    - Uses vertical alignment of mathematics curriculum to plan sequenced instruction
    - Includes varied measures for assessing student progress during instruction
    - Based on assessment data, classroom observation, and reflection, candidates identify students who need specialized instruction, including promising students and/or students with physical disabilities, learning disabilities, atypical development, or health conditions requiring instructional adaptations.

TPE 5: Assessing Student Learning

Monitoring Student Learning During Instruction

15. Demonstrate effective use of multiple measures for progress monitoring throughout mathematics instruction to determine whether all students, including English Learners and students with atypical development, are understanding content and making progress toward academic standards. Candidates anticipate, check for and address common misconceptions and identified misunderstandings and act upon this information during instruction.

Interpretation and Use of Assessments

16. Become familiar with a variety of formal and informal assessment strategies, as well as, formative and summative assessments, at varying levels of cognitive demand to determine students' progress and plan instruction, e.g., pre-assessments, summative benchmark tests, diagnostic instruments, and performance-based exercises.
17. Know how to familiarize students with the format of the state-adopted assessment program and how to accurately interpret assessment results of individuals and groups in order to develop and modify instruction.
18. Understand how to modify assessment instruments appropriately.
19. Identify strategies and design activities to promote student self-assessment and goal setting in relation to their progress and achievement in the mathematics curriculum.

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TPE 6: Developing as a Professional Educator

20. Evaluate their own mathematics content knowledge against the state-adopted Common Core State Standards and establish professional goals for increasing subject matter knowledge and teaching effectiveness.

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Attendance and Participation

All students are expected to attend each class and participate actively. Participating actively is defined as being on time and ready to learn, taking an active role in discussions, and working well in collaborative groups. If you know ahead of time that you will miss class due to job-related events or religious observances, please email these dates during the first two weeks of class so that your absence may be excused. If you have extenuating circumstances, contact me as soon as possible and prior to class, if possible. Attendance will be taken at each class session. You have the possibility of earning 4 points each class toward your participation grade.

Participation Scale	**Exhibits Participation Behaviors**
4 points – student always:	• Maintains professional dispositions
3 points – student frequently:	• Arrives on time
2 points – student sometimes:	• Contributes meaningfully to classroom discussions
1 point – student never:	• Engages in classroom activities

Grading

Rubrics will be used in evaluating assignments submitted for this course.
The final grade will be determined on a percentage basis according to the following scale:

A	100-95%	B+	89-87%	C+	79-77%	D+	69-67%	
A-	94-90%	B	86-83%	C	76-73%	D	66-63%	F < 60%
		B-	82-80%	C-	72-70%	D-	62-60%	

Assignments	**Scoring**
Participation	60 points
Review of Technology	30
Lesson Plan	100
Assessment Plan	100
Chapter Reflections/Explorations (10 points each)	80
Activity Sharing (10 points each)	80
Total	**450 Points**

Late work: 10% will be deducted if the assignment is one week late. 20% will be deducted if the assignment is two weeks late. No late work will be accepted after two weeks unless extenuating circumstances apply. Alert me by email if you have extenuating circumstances.

Professional Dispositions

The Department of Elementary Education has adopted a process for ensuring that all CSUN students uphold standards of knowledge, performance, and professional dispositions recognized by the education profession. Obtain detailed information about the list of Qualities Important to Future Teachers and Educational Professionals, the involuntary delay/withdrawal process, the Concern form, and student appeals, at http://www.csun.edu/education/eed/delay_withdrawal/index.html
A list of dispositions that are important to future teachers and educational professionals is found below:

A. Personal qualities important to the teaching/education profession
Possesses integrity, accepts responsibility, is highly motivated, evidences high academic achievement, displays perseverance, takes initiative, exhibits self-control, shows maturity of judgment, is punctual and reliable, demonstrates warmth and advocacy for children, and presents a professional appearance and demeanor.

B. Qualities important to collaboration
Establishes rapport with others, assumes appropriate roles in the collaborative process, works well with others and communicates respectfully, demonstrates effective communication skills, values teamwork, demonstrates a respectful appreciation for diverse perspectives, demonstrates a commitment to achieving team goals, and seeks to develop and maintain professional workplace relationships.

C. Commitment to professional growth
Responds appropriately to supervision, reflects on/evaluates strengths and areas for improvement, accepts constructive criticism and suggestions, displays interest and curiosity in the learning process, uses suggestions to improve skills and understanding, values life-long learning, strives to achieve competence and integrity, and is a self-directed learner.

D. Commitment to diversity and social justice
Demonstrates cultural respect and understanding, believes in equal educational/vocational opportunity, displays sensitivity to ethnically, linguistically, cognitively, physically, socially diverse groups and individuals, advocates high and appropriate expectations for all students, and treats all people equally.

E. Commitment to ethical practices
Maintains confidentiality, displays ethical behavior, is honest and trustworthy, abides by legal mandates and ethical responsibilities, uses sound, informed judgment.

Textbooks

Van de Walle, John. A., Karp, K., & Bay-Williams, J. M. (2016). *Elementary and middle school mathematics: Teaching developmentally*. (9th ed.). Boston: Pearson AB.

California Department of Education (2012). *K – 12 California's common core content standards for mathematics*. Sacramento, CA: Authors.
In August 2010, the California State Board of Education adopted the new Common Core Standards along with many other states. You can find these new 2013 adopted standards on the California Department of Education website under *Curriculum and Instruction*. The Common Core Standards can also be downloaded as a PDF file on the CDE website at www.cde.ca.gov/re/cc/

The pertinent standards for K – 5 can be found on pages 1-37 of this 153-page PDF file beginning with the Standards for Mathematical Practice. You will need the CA Common Core Mathematics Standards as you plan your math lesson.

Blackline Masters. To find the Van de Walle Blackline masters which appear at the end of the book in Appendix C (C3 – C11), Google "Blackline masters van de walle" and choose the "ablongman" site. A list of 78 blackline masters appears. Click on anyone of the worksheets to download the pdf and print. Many of these blackline masters can be used for the activities that we will share in class. (http://wps.ablongman.com/ab_vandewalle_math_6/0,12312,3547876-,00.html)

EdTPA (Performance Assessment for California Teachers)

The California Commission on Teacher Credentialing requires that every teacher candidate pass a performance assessment to earn a Multiple Subject credential. The edTPA Performance Assessment consists of four tasks. This course is designed to help you be successful in completing the Mathematics Assessment Task 4: Assessing Students' Mathematics Learning. The assignments in this course will help you plan effective mathematics lessons and assess students' mathematics learning. By developing formative and summative assessments, analyzing student work, and thinking about the next steps for students, you will be well prepared for the performance assessment in mathematics.

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Under California law, you cannot earn a Multiple Subject credential until all components of the EdTPA Performance Based Assessment are passed.

Course Assignments

All major assignments completed for this course must be completed in a professional manner, i.e., typed, edited, free of mechanical and spelling errors, grammatically correct and submitted on time. Further, each assignment must meet all the requirements as delineated in the description of the assignment. An assignment will be considered late if it is not turned-in on the date it is due. Ten-percent of the total possible points for an assignment will be deducted for the first week that an assignment is late, twenty percent for the second week.

Readings

- The Van de Walle Textbook is an integral component of the course. As it is the finest mathematics methods text published today, I have assigned readings, reflective writing, and activities from the text that will prepare you to teach K – 6 mathematics in elementary schools.

Chapter Reflections

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- The purpose of the Chapter Reflection writing assignments is to challenge you as a prospective or practicing teacher to confront your beliefs about teaching mathematics. Through your responses, we can begin to have a dialog about helping children to make sense of mathematics. Writing clarifies thought and acts as a catalyst for change.
- For Chapter Reflections you may
    1. Discuss your personal experience and compare it with the ideas in the chapter.
    2. Explore ideas in the chapter and write down questions you may have about them.
    3. Tell how exploring the ideas within the chapter helped your understanding of mathematics or mathematics teaching.

  The questions at the end of each chapter in the *Writing To Learn* or *For Discussion and Exploration* sections may help you to formulate ideas and opinions for reflection, but you do not have to answer these questions from the text for your Chapter Reflection.
- The Chapter Reflections should be in writing and will be collected every week as assigned. The Reflections may hand-written or typed, keeping in mind that ideas and substance are more important than presentation. A hand-written paragraph or two with your ideas is quite acceptable for Chapter Reflections.

Math Journal Explorations

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- It is always a good idea to record your comments, questions, and ideas related to recent readings, class activities, or discussion in a personal notebook. You may use this notebook for explorations suggested in the chapter. (This is the place to solve problems presented in the text when completing assigned readings.) These notes are for your personal use and learning but should be brought to class each week. The Math Journals will not be collected but you will receive credit for completing the assigned explorations.

Review of Mathematics Resources and Technology

- After reading Chapter 7 *Technology and School Mathematics* in the Van de Walle text, describe three applets or teacher resources from the National Library for Virtual Manipulatives or the NCTM Illuminations website. Discuss the value of each applet in developing students' mathematical understanding. (Due Week 4.)

Commented [ONL35]: Links to TPE 3.6, 3.8

Activities

- Several times during the course you will be asked to prepare an activity from the chapter and share it with your group. *Group members should communicate with each other before class so that duplication of activities does not occur*. During the group sharing, you will:
    1. Name: Give the name of the activity
    2. Purpose: State the purpose of the activity. Provide a context for the activity so your group members can understand what students need to know before the activity.
    3. Explain: Give instructions for the activity. Tell what students, partners, and group members do. Tell what teachers do.
    4. Model the activity.
    5. Student Learning: What is the potential for student learning? What are some possible extensions for the activity?
- Activities cannot be turned in late or shared at a later date. If you are absent and do not know what activities to choose, use activities from the last fourth of the chapter.
- Some manipulatives are available in ED2107 for your use: unifix cubes, multilink cubes, base ten blocks, fraction circles, tangrams, Cuisenaire rods, geoboards, geometric solids

Smarter Balanced Practice Test

- Take one practice test for Grade 3, 4, or 5 by going to the website and signing in as a guest. Record your answers and thoughts about the assessment in your Math Journal. Find the practice test at https://sbacpt.tds.airast.org/student/ or simply google "SBAC Practice Test".
- If you are interested in the answers and how the new assessment system will score the test you may go to the webpage: http://sbac.portal.airast.org/practice-test/resources/

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Mathematics Lesson & Assessment Plan

The Mathematics Lesson & Assessment Plan is a major assignment for the course. You will be designing a mathematics lesson for teaching one elementary grade and an assessment that is integrated with your lesson. Your math lesson plan should be a problem-based lesson following the guidelines in Chapters 3, 4, and 5 of the Van de Walle text. The BEFORE-DURING-AFTER format will be used for the lesson. The plan must meet the appropriate criteria and any lesson plan that does not will be returned for revision. You will be working on this lesson plan throughout the course. The lesson plan will help you to be a reflective teacher.

The Assessment portion of the Lesson Plan will be a rehearsal for the EdTPA Teaching Event during your student teaching assignment. You will be learning how to integrate an assessment of children's mathematical thinking into a lesson plan. Incorporating performance indicators and rubrics will help you to acquire the skills needed to assess students and analyze data to inform your practice. The Assessment Plan will be the Embedded Signature Assignment (ESA) for the EdTPA (Performance Assessment for California Teachers) credential requirements.

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- Mathematics Lesson Plan (Due Week 9)
- Assessment Plan (Due Week 11)
- Revised Lesson and Assessment Plan (if revisions are necessary) (Due Week 14)

Fall 2017 Calendar - Wednesday

EED 472 Mathematics Methods

Week	Content	Assignments *(Due following week)*
Week 1 Aug 30	• Introduction to Teaching Mathematics Developmentally • Course Overview • Mathematics Reform • NCTM & CCSS Standards • Principles & Process Standards • What it Means to Do Mathematics	1. Read Van de Walle Chapters 1 & 2. 2. Chapter 1 Reflection 3. Bring your Math Journal with your work from Chapter 2 Invitation to do Mathematics (Problems 1 – 4) to class.
Week 2 Sep 6	• Developing Understanding in Mathematics • Constructivism and Learning • Mathematical Knowledge • Learning Progressions • Teaching Developmentally • CCSS Mathematical Practices • In-class Problem Solving Task	1. Read VdW Chapter 3 on Teaching Through Problem Solving & Chapter 4 on *Planning in Problem-Based Classroom from pg. 57 to 70.* 2. Do Chapter 3 Reflection. 3. Download the new CA Common Core Mathematics Standards (K – 5) for your use.
Week 3 Sep 13	• Teaching Through Problem Solving • Three Part Lesson Format • Designing Effective Tasks • Technology for the classroom • California Common Core Standards • Looking at Student Work • Talk Moves • In-class Problem Solving Task	1. Read Chapter 6:Teaching Mathematics Equitably to All Children 2. Chapter 6 Reflection. 3. Read pp. 130 – 135 and page 138 on calculators in Chapter 7 on Technology. 4. Complete *Review of Technology Assignment (typed).*
Week 4 Sep 20	• Teaching All Students Mathematics • Diversity • Equity • Learning Disabilities • Calculators in the Classroom • Choosing Activities • Making the Most of Story Problems • ***(Review of Technology Assignment Due)***	1. Read Chapter 8 Developing Early Number Sense & finish reading Chapter 4 on Planning (pp. 70 – 83). 2. Bring one Activity from Ch. 8 to share with your group. (See Activities 8.1 to 8.29) Be able to tell where your activity fits into children's number development. 3. Download "Blackline Masters" and print any three examples to share.

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Week	Content	Assignments *(Due following week)*
Week 5 Sep 27	• Developing Early Number Concepts and Number Sense • Planning in the Problem-Based Classroom • Principles of Mathematical Discourse • Drill or Practice? • Homework and Textbooks • Mathematics Lesson Plan • Common Core Assessments: SBAC Smarter Balanced Assessment Consortium	1. Read Chapters 9 Developing Meaning for Operations & Chapter 5 Creating Assessments for Learning. 2. Be able to discuss at least four ways to conduct formative assessments from Chapter 5. 3. Take Smarter Balanced Practice Test for one grade (3 – 5). Record your answers and observations of the test in Math Journal. (Info on page 8.) 4. Bring one Activity from Chapter 9 to class. 5. Find a partner for the math lesson plan.
Week 6 Oct 4	• Developing Meaning for the Operations • Building Assessment into Instruction • Rubrics • Mathematics Lesson Plan • Explanation of EdTPA Embedded Signature Assignment (ESA) • Keyboard Symbols for Math	1. Read Chapter 10 (Developing Basic Fact Fluency) & Chapter 11 (Whole Number Place Value Concepts). 2. Bring one Activity from Ch. 10 to class. 3. Bring one Activity from Ch. 11 to class 4. Work on Math Lesson Plan. Bring to class 4 copies of the open-ended problem you plan to use. Note the Common Core Standard for the problem.
Week 7 Oct 11	• Whole Number Place Value Development • Place Value Concepts • Number Sense • Helping Children Master the Basic Facts	1. Read Chapter 12 on Addition and Subtraction & Chapter 13 on Multiplication and Division. 2. Bring one Activity from Chapter 12. 3. Bring Math Journal explorations: Do each Pause & Reflect in Chapters 12 & 13. Bring to class. 4. Work on Math Lesson Plan.

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Commented [ONL57]: Links to TPE 5.1

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Week	Content	Assignments *(Due following week)*

Week 8 Oct 18	• Whole Number Computation
	• Invented Strategies
	  o The Empty Number Line
	  o Splitting and Recording
	  o Sticks and Dots
	• Alternative Algorithms
	• Computational Estimation
		1. Read Chapter 14 on Algebraic Thinking.
		2. Read Chapter 23 (pp. 592 - 603) on Integer Models you can introduce in 4th grade.
		3. Bring Activity from Ch. 14.
		4. Complete Lesson Plan. Be sure that you and your partner each have your own copy to turn in.

Week 9 Oct 25	• Algebraic Reasoning • Patterns • Growing Patterns • Integer Concepts • Signed Number Models **(Mathematics Lesson Plan Due)**	1. Read Chapter 15: Developing Fraction Concepts 2. Bring Math Journal explorations: Do each Pause & Reflect in Chapter 15. 3. Work on Assessment Plan.
Week 10 Nov 1	• Developing Fraction Concepts • Fraction Number Sense • Models for Fractions • Integrating Assessment into Lesson Plan – Aligning with Common Core Standards for Mathematical Practices	1. Read Chapter 16: Developing Fraction Operations 2. Bring Math Journal explorations: Do each Pause & Reflect in Chapter 16. Be able to explain Partition and Measurement concepts for division of fractions. 3. Complete Assessment Plan. Be sure that you and your partner each have your own copy to turn in.

Week 11 Nov 8	• Computing with Fractions
	• Informal exploration with fractions
	• Developing algorithms for fractions
	• Multiplication of fractions
	  • Array, Area, Partial Products
	• Division of fractions
	  ▪ Partition and Measurement
	• Fractions Progressions and Student work
	• EdTPA Teaching Event 4: Assessment Checklist
	(Assessment Plan Due)
		1. Read Chapter 19 on Measurement Concepts.
		• Bring Activity from Chapter 19.

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Week	Content	Assignments *(Due following week)*
Week 12 Nov 15	• Developing Measurement Concepts • Examine Content Standards • Tools of Measurement • Conceptual Understanding of Measurement • Estimation of measurements • Area and Volume relationships • Time and Money	1. Read Chapter 20: Geometric Thinking 2. Bring one Activity from Ch. 20 to class. 3. Complete Revisions of Mathematics Lesson and Assessment Plans, if necessary.
Week 13 Nov 22	Thanksgiving Holiday – No Class Meeting	
Week 14 Nov 29	• Geometric Thinking • Van Hiele Levels • Spatial sense • Learning in Centers • Cooperative Spatial Problem Solving • EdTPA Teaching Event Task 4: Self-Assessment on Rubrics **(Revision of Mathematics Lesson and Assessment Plan due)**	In your math journal, write 3 to 5 sentences describing the thinking behind your mathematics instruction. Describe how you see your role as a teacher and what you envision "doing mathematics" in your classroom will look like, sound like, and feel like. Then, relax. You have worked hard during the semester.
Week 15 Dec 6	• Wrap-Up • Review of Course • Lesson Plan Sharing/Small Group Presentation/ • Evaluation • Return Lesson Plan Revisions	Enjoy the break!
Finals Week	No Class Meeting during finals week.	

Commented [ONL72]: Links to TPE 3.1

Commented [ONL73]: Links to TPE 3.3, 1.8

Commented [ONL74]: Links to TPE3.1

Commented [ONL75]: Links to TPE 5.1 and Program Standard 5B

Commented [ONL76]: Links to TPE 1.3, 2.1, 2.2, 2.3, 2.5, 2.6, 3.3, 6.1, 6.2

Mathematics Assessment Plan

(Due Week 11)

FORMATIVE AND SUMMATIVE ASSESSMENTS

One objective for this assignment is to develop a classroom assessment and record keeping system for mathematics. Another objective is to diagnose student learning needs by analyzing student work. Your assessment plan must enable you as a teacher to determine the progress your students are making in their mathematical skills and understandings in a classroom using a standards-based mathematics curriculum at the elementary level. From your assessment, you will identify the next steps you will take as a teacher for instructing the whole class and individual students. Use Chapter 5 in the Van de Walle text to guide you in developing appropriate assessments.

You should have two types of assessment included in the lesson plan: Formative Assessment Checklist and Summative Assessment Rubric.

Formative Assessment: Assessing student learning to *INFORM* your teaching.

1. Describe how you will know your students are learning during the lesson.
    a. Question: As students begin to work, what indicators of mathematical understanding will you look for? (i.e., What do you expect students to say and do?)
    b. Question: What skills do you anticipate observing during the lesson? (What prior knowledge will students use? What math skills are developmentally appropriate for this task? What tools and symbols might be used?)
    c. Question: What types of strategies might you see as students work?

2. Creating a Formative Checklist: A Formative Assessment Checklist is a systematic plan for gathering information while observing and listening to students during the lesson. Choose one of the following ideas below for your Formative Assessment:
    i. Anecdotal Notes (p. 88, Fig. 5.2) (Create at least 6 notes.)
    ii. Checklist for Individuals (p. 89, Figure 5.3)
    iii. Checklist for Full Class (p. 89, Figure 5.4)
    iv. Observation Rubric Checklist (p. 97, Figure 5.8) Note: Black print in figure is generic; Blue print is specific to lesson in this example.

3. After deciding upon the type of Formative Checklist, use what you have described in 1a, 1b, 1c, and insert these ideas into the checklist. Use VdW to help you with specific academic language for math topics. Be sure to include your lesson task objective at the top of the Formative Checklist. Each part of the checklist should relate to the mathematical objective and allow for different levels of performance. Please fill out the formative checklist with students from your "classroom."

Commented [ONL1]:

Commented [ONL2]: Links to TPE 5.2

Commented [ONL3]: Links to TPE 1.5, 1.8, 3.1, 3.3, 5.1

Commented [ONL4]: Links to TPE 3.3, 5.1

Summative Assessment: Assessing whether students met the objective of the lesson.

1. Developing the Assessment by Articulating the Objective: What is the objective of the lesson that you want your students to meet? What were the directions to the students for this assessment? (If the problem statement is not included in the student work, reprint open-ended problem here.)

2. Evidence Collection: Describe the final product you will collect in order to know whether students met the objective of the lesson (i.e., group work, journal, individual work, presentations, diagnostic interview).

3. Create a Summative Assessment Rubric: Collect evidence of student work. Use your evidence to create a Summative Assessment Rubric (p. 95-96) with either four points or three points that assesses the performance of the students. Include performance indicators (see bullets below). *Rubrics should be specific to the objective of the lesson and not a generic rubric*.
    - Performance indicators are task-specific statements that describe what performance looks like at each level of the rubric (i.e., the 4, 3, 2, 1 sections) p. 96.
    - The performance indicators in the rubric should focus on patterns of student thinking, skills, and student errors.
    - Mathematical content and processes, such as mathematical reasoning, representations used, explanations given, and connections that students made should also be included in the performance indicators.
    - When thinking about the rubric, consider what makes a student work excellent? Put these ideas in the rubric. What makes another student work sample unsatisfactory? Put these ideas in the rubric. Then fill in ideas for the middle of the rubric attaching ideas to the proficient and marginal student work.

4. Evaluate Student Work: Use 3 or 4 student work samples of the final product that show evidence of *Excellent, Proficient, Marginal*, and *Unsatisfactory* work. If you choose a three-point rubric, perhaps show *Above and Beyond, On Target*, and *Not There Yet* work. Label the student artifacts clearly. This work can be from any students in your classroom. If you are not currently in a classroom, you may "create" representative work samples.

5. Assessment Analysis: Discuss what most students appear to understand well and any misunderstandings, confusions or needs that were apparent for some or most students. **Cite specific evidence** to support your discussion from the three or four student work samples.

Commented [ONL5]: Links to TPE 3.1

Commented [ONL6]: Links to TPE 3.3, 5.2

Commented [ONL7]: Links to TPE 1.5, 2.6, 3.1, 5.1

Commented [ONL8]: Links to TPE 5.2

Commented [ONL9]: Links to TPE 1.5, 1.8, 3.3, 5.2, 5.6

6. Next Steps: Propose differentiated next steps for instruction for each level of performance. Then, create a re-engagement plan for one student's work sample. Based on their Summative Assessment, choose a specific activity from the Van de Walle text to "re-engage" your selected student. Provide a rationale for why this activity will be beneficial for this student's learning goals.

Commented [ONL10]: Links to TPE 1.5, 1.8, 2.5, 3.2, 3.3, 5.5, 5.6, 5.8

7. Provide feedback that promotes student learning. Write specific feedback *on student work* that helps the student understand what he/she has done well and what is needed for improvement. Use thick pen or different color for feedback.

Commented [ONL11]: Links to TPE 2.2, 2.5, 3.2, 5.3

(Hint: Review PACT Rubrics 1 and 3 to ensure you have fulfilled expectations.)

Assessment Plan Rubric (Based Upon PACT and edTPA Requirements)

1. ANALYZING STUDENT WORK FROM AN ASSESSMENT **How does the candidate demonstrate an understanding of student performance with respect to standards/objectives?**			
Level 1	**Level 2**	**Level 3**	**Level 4**
• The criteria/rubric and analysis have **little connection** with the identified standard or objectives. OR • Student **work samples do not support the conclusions** in the analysis.	• The criteria/rubric and analysis **focus on what students did right or wrong** in relationship to identified standards or objectives. • The analysis of whole class performance describes **some differences in levels** of student learning for the content assessed.	• The criteria/rubric and analysis **focus on patterns of student errors, skills, and understandings** to analyze student learning in relation to standards or objectives. • **Specific patterns** are identified for **individuals or subgroup(s)** in addition to the whole class.	All components of Level 3 plus: • The criteria/rubric and analysis focus on **partial understandings** as well. • The analysis is **clear and detailed.** Candidate describes **relationship between or among patterns** of learning.
2. USING ASSESSMENT TO INFORM TEACHING **How does the candidate use the analysis of student learning to propose next steps in instruction?**			
Level 1	**Level 2**	**Level 3**	**Level 4**
• Next steps are **vaguely related to or not aligned with the identified** student needs. OR • Next steps are **not described in sufficient detail** to understand them. OR • Next steps are **based on inaccurate conclusions** about student learning from the assessment analysis.	• Next steps focus on improving student performance through **general support that addresses some identified student needs**. • Next steps are **based on accurate conclusions about student performance** on the assessment and are described in sufficient detail to understand them.	• Next steps focus on improving student performance through **targeted support** to individuals and groups to address specific **identified needs**. • Next steps are **based on whole class patterns** of performance and **some patterns for individuals and/or subgroups** and are described in sufficient detail to understand them.	All components of Level 3 plus: • Next steps demonstrate a **strong understanding** of both the identified **content standards/objectives** and of **individual students and/or subgroups**. Analysis includes **explicit connections** between the identified area of struggle and underlying mathematical understandings and misconceptions.

Commented [ONL12]: Links to TPE 1.5, 3.1, 3.2, 5.1

Commented [ONL13]: Links to TPE 2.5

Commented [ONL14]: Links to TPE 1.8, 2.5, 3.2, 5.2

Commented [ONL15]: Links to TPE 2.5, 5.6, 5.8

3. USING FEEDBACK TO PROMOTE STUDENT LEARNING What is the quality of feedback to students?			
Level 1	**Level 2**	**Level 3**	**Level 4**
• Feedback is **general and provides little guidance for improvement** related to learning objectives. OR • The feedback contains **significant inaccuracies**.	• **Timely** feedback **identifies what was done well and areas for improvement** related to specific learning objectives.	• Specific and timely **feedback helps the student understand what s/he has done well**, and provides **guidance for improvement.**	• Specific and timely comments are **supportive** and **prompt analysis by the student of his/her own performance**. • The feedback shows **strong understanding of students as individuals** in reference to the content and language objectives they are trying to meet.

Commented [ONL16]: Links to TPE 1.8, 2.2, 2.5, 5.3

Assessment Plan Grading Sheet	Rubric Level	Comments
Formative Assessment		40 points
Type of formative checklist used _____ 1. What you will observe: ___ Indications of mathematical understanding ___ includes skills observed ___ includes strategies observed		
2. Plan for Formative Assessment ___ information gathering is systematic ___ checklist is specific to math objectives of lesson ___ indicates what learning is valued in the task ___ shows different levels of performance		
Summative Assessment		60 points
1. Final Product ___ Final product shows students' work in meeting the objectives		
2. Student artifacts ___ shows 3 or 4 levels of student work ___ artifacts are labeled appropriately		
3. Rubric for summative assessment ___ specific to lesson/task/objectives ___ specific focus on student thinking ___ specific focus on explanations ___ specific focus on skills ___ specific focus on problem solving representations and connections ___ specific focus on student errors		

4. Understandings and misunderstandings ___ analyzes class performance considering what most students understand well ___ describes misunderstanding or confusions of some students ___ describes needs for some students ___ cites evidence from 3 or 4 student samples to support analysis		
5. Next Steps and Re-engagement Plan ___ Next steps given for one student at each level of performance ___ Re-engagement plan for one student ___ Activity from Van de Walle chosen ___ Rationale for activity provided		
6. Providing Feedback ___ gives specific feedback ___ feedback helps student understand what was done well ___ feedback helps student know what is needed for improvement		
		Total: 100 points

If you would like to revise your assessment plan, please turn in original and this sheet along with the revision.

Department of Elementary Education

Commented [ONL1]:

Lesson Plan

Candidate	Date	Grade level
Subject & topic	☒ Single-day lesson	☒ Whole-class lesson
English Language Development levels of students in the class or group: ☒ Emerging ☐ Expanding ☒ Bridging	Name of instructional model ☒ Problem-based Lesson	

California Common Core Standard: (Please copy complete standard. Do not include examples.)

Commented [ONL2]: Links to TPE 3.1

Objective: (What do you want students to learn?)

The Problem Task

Commented [ONL3]: Links to TPE 1.5, 4.3

Create your own original problem solving task based upon children's literature or topics of interest to students at your grade level.

(Expand this box to fit the task.)

Vocabulary:

Materials/Technology: (Include copies of any handouts, problem tasks with plenty of blank spaces for children to show work, pictures, word walls, or writing on white boards/doc camera).

Commented [ONL4]: Links to TPE 3.6, 4.4

Classroom Description: This classroom reflects the diversity of California schools. The classroom population includes typically developing students, gifted or promising students and the following students who will need additional accommodations and intervention:

- Emilio is an Emerging English Language Learner and needs special interventions during this lesson.
- Bridget is a Bridging English Language Learner and needs special interventions during this lesson.
- Marcia has difficulty keeping numbers in working memory and needs special accommodations for this learning disability during this lesson.
- Hayden has difficulty with attention and lacks skills to independently initiate work. He will need additional accommodation and intervention during this lesson.
- Peter is a mathematically promising student who will need extension or enrichment options.

Commented [ONL5]: Links to TPE 1.6, 3.2

Commented [ONL6]: Links to TPE 1.4, 3.2

Commented [ONL7]: Links to TPE 1.4, 2.5, 3.2, 3.5, 4.2,

Procedure for Problem-Based Lesson

Before (pp. 58-61 VdW):

1. Introduce students to the problem. Prepare students mentally for the task.
2. Be sure that students understand the problem. Activate useful prior knowledge.
3. Establish clear expectations of students and what products you expect. Include any visuals of what you might use to explain your lesson to others (handouts, pictures, sample activities.)

Commented [ONL8]: Links to TPE 2.2, 2.3

Commented [ONL9]: Links to TPE 1.1

Commented [ONL10]: Links TPE 2.6

During (pp. 61-63 VdW):

1. Let students work on problem.
2. Listen actively. What questions will you have prepared to push students' thinking?
   This is the time to support student's thinking without telling how to solve the problem. What clarifying questions might you plan?
3. What prompts, hints, or suggestions will you give students?
4. What challenges or worthwhile extensions will you give students who finish early?
5. What accommodations or modifications will you use
   - To help students who have Learning Disabilities (Hayden and Marcia) ?
   - What strategies will you use for English Learners (Emilio and Bridget)? (See pp. 114-121 of Van de Walle for strategies to teach English Learners and 107-113 for suggestions on accommodations and modifications for students with disabilities that relate specifically to this lesson—i.e. not generic strategies such as *sit closer to the board*.)
   - What strategies will you use for mathematically promising or gifted students? (Hayden).

Commented [ONL11]: Links to TPE 1.8, 3.3, 4.5, 4.2

Commented [ONL12]: Links to TPE 3.3, 3.6

Commented [ONL13]: Links to TPE 1.8 , 3.2, 3.6, 2.5, 4.2

Commented [ONL14]: Links to TPE 1.4, 1.8, 2.5, 3.2, 3.5, 4.2, 4.4

Commented [ONL15]: Links to TPE 1.6, 3.5, 3.6 4.4

Commented [ONL16]: Links to TPE 3.2, 3.5, 3.6, 4.2, 4.4

After (pp. 63-65 VdW):

1. What norms for productive classroom discussion do you want to foster in your classroom? How will you orchestrate your discussion? (see pages 49 – 52 and 69 – 70)
2. How might students solve the problem? Give four anticipated examples using numbers, pictures and words and identify the strategy the child used for ANY student in your class.
3. In what order should the four children who you identified in question two, share aloud to the class? Why did you choose that order? What questions will you pose to connect students thinking? (see pp. 49-52)
4. What do you want the class to learn from sharing and how will you articulate or highlight this for the students? (Hint: How does this relate to your objective for the lesson?)

Resources: Give a bibliographic list of the resources you used to design your lesson plan and create your own problem task. Include the CA Common Core State Standards (see syllabus), Van de Walle text (references found in course syllabus) and other materials.

Do not use or download problem solving tasks or lessons from the internet. The purpose of this assignment is to create your own ORIGINAL problem task and lesson plan.

Commented [ONL17]: Links to TPE 1.5, 2.6, 3.3, 4.7

Commented [ONL18]: Links to TPE 1.8, 2.6, 3.1, 3.4, 4.7

Commented [ONL19]: Links to TPE 1.5, 2.6, 3.1, 4.7

Commented [ONL20]: Links to TPE 1.5

Mathematics Lesson Plan Rubric				
	Objective/Standards	Lesson Plan	Teaching All Students	Resources and Bibliography
4	• Clearly Identifies topic and objective of lesson • Provides well-structured, specific objective(s) of what students will learn or achieve • Identifies key Common Core State Standards	• A comprehensible lesson plan with a problem-based and student-centered learning approach • Each question in Before, During, After section answered thoughtfully • Scripted questions cover prior knowledge, engage students, elicit student understanding, hints to help students, challenges for promising students • Four strategies are highlighted and connected in scripted discussion in summary • Open-ended task is used • Visuals included that help explain lesson	• Describes thoroughly and thoughtfully all modifications for diverse students • Uses creative ideas to accommodate or modify lesson for ELs, Learning Disabled students	• Thorough and correct listing of bibliography and resources used to create this product: VdW, Common Core references included • Comprehensive record of ideas and resources for extending lesson
3	• Identifies topic of lesson • Provides specific objectives of what students will achieve • Identifies Common Core State Standards related to topic	• A well-thought out lesson plan with a problem-based approach • Many questions in Before, During, After section are clearly explained • Structure for student discussion and explanation is present with four solutions • Visuals included • Organized procedures	• Describes modifications for diverse learners • Challenges for Promising students are strong • Ideas for English Learners go beyond pairing up	• Provides list of bibliography and resources used to create this lesson • Websites are provided with copies of pages used
2	• Provides objectives somewhat tied to student performance • Identifies (too many or too few) somewhat related Common Core State Standards • Minimal identification of topic of lesson	• Lesson plan is somewhat problem-based • Most Questions in Before, During, After section are explained • Limited number of questions offered for student understanding, etc. • Some visuals included • Some procedures are organized	• Describes some modifications for diverse learners • Learning disabled students may not be well-defined and thus modifications are somewhat weak, non-specific	• Provides some bibliographic sources and resources used to create lesson • Websites are provided with copies of pages used

Commented [ONL22]: Links to TPE 1.5

Commented [ONL24]: Links to TPE 1.4, 1.6, 2.2, 3.5, 4.4

Commented [ONL21]: Links to TPE 3.1

Commented [ONL25]: Links to TPE 1.4., 1.6, 2.2, 2.5, 3.5, 4.4

Commented [ONL23]: Links to TPE 1.1, 1.3, 1.5, 2.2, 2.5, 2.6, 3.4, 3.5, 3.6, 4.4, 4.7

1	• Few objectives tied to what students will be able to do • Common Core Standards loosely related to lesson	• Lesson plan is not problem based • Before, During, After components unrelated to student thinking • Few materials are included or questions answered • Activity is not connected to the objective	• Little or cursory description of modifications for all learners • Not equitable for all learners	• Minimal bibliography and resources • Websites provided

Math Lesson Plan Grading Sheet	Rubric Level	Comments
Objective and Standards		15 points
1. Objective identifies specifically what children will learn		
2. CA Common Core Standards listed		
Lesson Plan		60 points
1. Original Problem-based lesson; Student-centered, inclusive, equitable, open-ended task		
2. *Before* activities ____ questions eliciting prior knowledge & student interest included ____ student expectations established		
3. *During* activities ____ questions to probe for student' s understanding included ____ questions for hints ____ extensions are provided for early finishers		
4. *After* activities ____ norms & plan for orchestrating discussion ____ 4 anticipated examples ____ justification for order of share ____ questions posed to connect thinking ____ articulated discussion objectives		
5. Materials (handouts showing problem task for students, explanatory pictures, checklists, word walls, etc)		
Teaching All Students		20 points

Commented [ONL26]: Links to TPE 3.1

Commented [ONL27]: Links to TPE 1.1, 1.3, 1.4, 1.5, 1.6, 1.8, 2.2, 2.3, 2.5, 3.5, 4.4, 6.2, 6.3

Commented [ONL28]: Links to TPE 1.1, 1.3, 2.2, 2.3

Commented [ONL29]: Links to TPE 1.4, 1.5, 1.8, 2.5

Commented [ONL30]: Links to TPE 1.5, 1.8, 2.5, 2.6, 3.4,

1. Accommodations/modifications for diverse learners: Addressed ____ Linguistically diverse students (EL) ____ Students with disabilities (2 types) ____ Challenges for promising students ____ Teacher-created materials for accommodation		
Bibliography or Resources		5 points
1. Bibliography w/ VdW, Common Core SS, etc		

Commented [ONL31]: Links to TPE 1.4, 1.6, 2.2, 2.3., 2.5, 3.5, 3.6, 4.4

Grade: /100 You may improve your grade by revising your lesson plan. Please turn in original plan,
this sheet, and revision with highlighted changes.

EED 472 Model Syllabus-- Linking

TPE 1 Engaging and Supporting All Students in Learning

1.1- pages I:2
1.3- pages I: 2
1.4- pages I:2, P:9, A:11
1.5- pages I:2, P:9, A:12
1.6- pages I:9
1.8- pages I:2 ,P:10, A:12

TPE 2 Creating and Maintaining Effective Environments

2.1- pages I:9
2.2- pages I:2, P:11
2.3- pages I:3, P:9, A:11
2.5- pages I:3, P:9
2.6- pages I:2, P:9

TPE 3 Understanding and Organizing Subject Matter for Student Learning

3.1- pages P:9, A:10
3.2- pages P:2, A:9
3.3- pages I:2, P:10, A:11
3.4- pages P:11
3.5- pages I:2, P:9, A:11
3.6- pages P:3
3.8- pages I:9

TPE 4 Planning Instruction and Designing Learning Experiences for All Students

4.2- pages I:2, P:11
4.3- pages I:3, P:9
4.4- pages I:3, P:11
4.5- pages I:2
4.6- pages I:9
4.7- pages I:2, P:9, A:11
4.8- pages I:9

TPE 5 Assessing Student Learning

5.1- pages P:10, A:12
5.2- pages I:3, P:10, A:12
5.3- pages I:3, P:10, A:12
5.5- pages I:3
5.6- pages I:3, P:12
5.8- pages I:3, P:12

TPE 6 Developing as a Professional Educator

6.1- pages I:3, P:12
6.2- pages I:4, P:9
6.3- pages I:9, P:11
6.4- pages I:4
6.7- pages I:5, P:9

Lesson plan link on page 11.
Assessments assignment link on page 12.