	THE UNIVERSITY OF TEXAS AT EL PASO **College of Education- Department of Teacher Education**

Title of Course: ELED 4310 (13468) Teaching Mathematics in Elementary Classrooms (Enhanced Hybrid)	**Credits:** 3
Semester: Fall 2025 **Class meeting time:** W 12:00 p.m. – 2:50 p.m. **Class meeting place:** EDUC 405 for F2F meetings	**Instructor Information:** **Professor:** Dr. David J. Carrejo, Ph.D. **Office:** College of Education, EDUC 802 **Phone:** 915-747-5856 **E-mail:** dcarrejo@utep.edu (**best means of contact**) **Office Hours:** **By appointment (F2F or Zoom)**

This syllabus is subject to change as needed. Any changes will be announced in class, via UTEP e-mail, and on Blackboard.

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I. Course Description

This course explores effective methods for teaching mathematics in the elementary grades. A central focus is the equity principle (mathematics for all), alongside the development of specialized knowledge to foster students' conceptual understanding of quantitative reasoning, geometry, and early algebra. Through hands-on engagement and critical reflection, students will examine their own experiences and beliefs about mathematics and its instruction. The course treats mathematics as a dynamic discipline, contrasting traditional ideas of 'knowing' and 'doing' mathematics with the vision championed by reform movements, grounded in constructivist principles of learning and teaching. They will explore the transformative power of technology, engaging with interactive mathematics software for dynamic exploration and leveraging generative AI to design effective learning experiences and provide personalized support. This course directly aligns with the professional development standard established by the Texas State Board for Educator Certification: The mathematics teacher understands mathematics teaching as a profession, knows the value and rewards of being a reflective practitioner, and realizes the importance of lifelong commitment to professional growth and development.

II. Course Objectives

Upon completion of this course, pre-service teachers will be able to:

1. **Analyze:** Explain how children in elementary grades develop an understanding of key mathematical concepts by using and connecting multiple representations.
2. **Design:** Create practical mathematics lessons for elementary children that incorporate constructivist principles, utilize the backward design framework, and address the specific learning needs and challenges of diverse learners in mathematics.
3. **Implement:** Effectively select and incorporate appropriate tools, including manipulatives and technology, to enhance students' mathematical reasoning and problem-solving skills.
4. **Reflect:** Critically examine their beliefs and knowledge about mathematics and teaching and analyze how these influence their instructional decisions and classroom practices.

III. Student Learning Outcomes

Students will develop a comprehensive set of skills, knowledge, and abilities essential for becoming effective and reflective mathematics teachers in the elementary grades. Specifically, upon completion of this course, pre-service teachers will cultivate:

a. **Essential Skills:**
   1. **Analytical Skills:** The ability to analyze how children develop mathematical understanding using various representations and to diagnose misconceptions.
   2. **Lesson Design Skills:** The practical skill of creating high-quality, student-centered mathematics lessons integrating constructivist principles and backward design.
   3. **Instructional Implementation Skills:** The ability to effectively select and integrate appropriate pedagogical tools, such as manipulatives and technology (including generative AI), to foster mathematical reasoning and problem-solving.

4. **Reflective and Self-Assessment Skills:** The capacity to critically examine their mathematical beliefs and teaching practices, and analyze their influence on instructional decisions and student learning.

b. Core Knowledge:

1. **Child Development in Mathematics:** A deep understanding of how elementary-grade children develop key mathematical concepts (e.g., quantitative reasoning, geometry, early algebra).
2. **Pedagogical Content Knowledge (PCK):** Knowledge of effective elementary mathematics teaching strategies, including using multiple representations and designing conceptual tasks for diverse learners.
3. **Mathematics as a Discipline:** A foundational understanding of mathematics as a dynamic, interconnected discipline, aligning with modern reform visions.
4. **Constructivist Learning Theory:** Knowledge of how constructivist principles apply to mathematics education for lesson design and classroom interactions.
5. **Backward Design Framework:** Practical knowledge of applying the backward design process for alignment of objectives, assessment, and instruction.
6. **Equity Principles:** Knowledge of the "mathematics for all" principle and strategies to address diverse learning needs for equitable access.
7. **Professional Standards:** Awareness and understanding of professional standards for mathematics educators (e.g., Texas SBEC).

c. Key Abilities:

1. **Ability to Foster Conceptual Understanding:** To move beyond procedural fluency and cultivate genuine conceptual understanding in future students across mathematical topics.
2. **Ability to Differentiate Instruction:** To adapt instruction to meet the specific learning needs and challenges of all students.
3. **Ability to Utilize Educational Technology and Manipulatives:** To leverage both low-tech manipulatives and digital tools effectively to enhance mathematical learning and engagement.
4. **Ability to Engage in Professional Growth:** To embody the characteristics of a reflective practitioner committed to lifelong professional development.

D. STUDENT LEARNING OUTCOMES -- MATHEMATICS CONTENT			
TEXAS CONTENT STANDARDS [SBEC]	**TExES STANDARDS (CERTIFICATION EXAM)**	**ALIGNED COURSE OBJECTIVES (COs)**	**MEANS OF ASSESSMENT**
Standard I. Number Concepts: Understand and use numbers, number systems and their structure, and operations and algorithms	• Counting • Equivalency (and relative magnitude) • Integers, rational and real numbers • Place value, decimals, and percentages	**COs 1, 2, 3, & 4**	• Discussion boards • Homework assignments • Lesson design and reflection
Standard II. Patterns and Algebra: Understand and use patterns, relations, functions, algebraic reasoning, and analysis	• Relations and functions • Sequences (patterns) • Tabular, geometric, and symbolic representations • Inequalities	**COs 1, 2, 3, & 4**	• Discussion boards • Homework assignments • Lesson design and reflection
Standard III. Geometry and Measurement: Understand and use geometry, spatial reasoning, and measurement concepts and principles.	• Units of measurement • Vectors and angles • Length, area, and volume • Symmetry • Ratio and proportion	**COs 1, 2, 3, & 4**	• Discussion boards • Homework assignments • Lesson design and reflection
Standard IV. Probability and Statistics: Understand and use probability and statistics and their applications.	• Collecting and representing data • Measures of central tendency • Principles of Probability • Combinations and permutations	**COs 1, 2, 3, & 4**	• Discussion boards • Homework assignments • Lesson design and reflection
Standard V. Mathematical Processes: Understand and use mathematical processes to reason mathematically, to solve mathematical problems, to make mathematical connections within and outside of mathematics, and to communicate mathematically.	• “Proof” and justification • Deductive versus inductive reasoning • Learning through multiple representations • Estimation and error • Financial literacy	**COs 1, 2, 3, & 4**	• Discussion boards • Homework assignments • Lesson design and reflection
Standard VI. Mathematical Perspectives: The mathematics teacher understands the historical development of mathematical ideas, the interrelationship between society and mathematics, the structure of mathematics, and the evolving nature of mathematics and mathematical knowledge.	• History and evolution of certain mathematical concepts, procedures, and ideas	**COs 1 & 4**	• Discussion boards • Homework assignments • Lesson design and reflection
Standard VII. Mathematical Learning and Instruction: Understands how children learn and develop mathematical skills, procedures, and concepts, knows students' typical errors, and uses this knowledge to plan, organize, and implement instruction, meet curriculum goals, and teach all students to understand and use mathematics.	• Application of research-based theories and principles of learning mathematics • Transitions between concrete, symbolic, and ‘abstract’ representations of mathematical knowledge • How manipulatives and technological tools can be used appropriately to assist students in developing, comprehending, and applying mathematical concepts • How to develop clear learning goals	**COs 1, 2, 3, & 4**	• Discussion boards • Homework assignments • Lesson design and reflection
Standard VIII. Mathematical Assessment: Understands assessment and uses a variety of formal and informal assessment techniques appropriate to the learner on an ongoing basis to monitor and guide instruction and to evaluate and report student progress.	• How to use a variety of formal and informal assessments and scoring procedures to evaluate mathematical understanding, common misconceptions, and error patterns.	**CO 1 & 2**	• Discussion boards • Homework assignments • Lesson design and reflection

E. STUDENT LEARNING OUTCOMES -- CURRICULUM & INSTRUCTION			
	TEACHER PEDAGOGY STANDARDS [SBEC] (Curriculum & Instruction) ELED 4310 students will be able to:	**COURSE OBJECTIVES (Cos), EDGE ADVANTAGES (EAs), & MINER ASSESSMENT (MA) ALIGNMENT**	**MEANS OF ASSESSMENT**
COURSE	Demonstrate their understanding of instructional planning and delivery by providing standards-based, data-driven, differentiated instruction that engages students, makes appropriate use of technology, and makes learning relevant for today's learners.	• COs 1, 2, & 3 • EA.3 Critical Thinking; EA.7 Problem Solving; • MA 1.1 Standards & Alignment; MA 1.4 Activities; MA 2.3 Communication; MA 2.4 Differentiation	• Lesson design and reflection • Homework assignments
COURSE	Ensure high levels of learning, social-emotional development, and achievement outcomes for all students, taking into consideration each student's educational and developmental backgrounds and focusing on each student's needs.	• COs 1, 2, 3, & 4 • EA.8 Social Responsibility • MA 1.3 Knowledge of Students; MA 2.1 Achieving Expectations; MA 2.3 Communication	• Lesson design and reflection • Discussion boards/Blogs • Homework assignments
COURSE	Exhibit a comprehensive understanding of their content, discipline, and related pedagogy as demonstrated through the quality of the design and execution of lessons and their ability to match objectives and activities to relevant state standards.	• COs 1, 2, 3, & 4 • EA.1 Communication • MA 2.2 Content Knowledge & Expertise	• Lesson design and reflection • Homework assignments
COURSE	Use formal and informal methods to assess student growth aligned to instructional goals and course objectives and regularly review and analyze multiple sources of data to measure student progress and adjust instructional strategies and content delivery as needed.	• CO 2 • EA.7 Problem Solving • MA 2.5 Monitor & Adjust	• Lesson design and reflection • Discussion boards/Blogs • Homework assignments
RESIDENCY	Hold themselves to a high standard for individual development, pursue leadership opportunities, collaborate with other educational professionals, communicate regularly with stakeholders, maintain professional relationships, comply with all campus and school district policies, and conduct themselves ethically and with integrity.	• CO 4 • EA.3 Critical Thinking • EA.6 Leadership • EA.9 Teamwork • MA 4.2 Commitment to the Teaching Profession	• Final reflection assignment • Lesson design reflection • Discussion board/Blogs

IV. Learning Modules:

This course embeds a **modular format**—that is, each week is "packaged" as a single module so that all the materials, lecture notes, submission areas, and discussion posts are in one location for that week.

V. Required Text, Readings, and Interactive Software:

- Carrejo, D.J. (2024). ***Foundations for teaching elementary and middle school mathematics*** (*2nd edition*). Dubuque, IA: Kendall-Hunt Publishing. **May be purchased at:** https://he.kendallhunt.com/product/foundations-teaching-elementary-and-middle-school-mathematics

- Artzt, A.F., Armour-Thomas, E., et al. (2015). ***Becoming a Reflective Mathematics Teacher: A Guide for Observations and Self-Assessment (3rd ed.)***. Routledge. Available through the UTEP Library at: https://doi-org.utep.idm.oclc.org/10.4324/9781315776941

- ***GeoGebra: Dynamic Software for Everyone*.** Available: https://www.geogebra.org/download GeoGebra is open-source dynamic mathematics software for all levels of education that combines geometry, algebra, spreadsheets, graphing, statistics, and calculus in one easy-to-use package. Geometry, algebra, and a data spreadsheet are connected and fully dynamic. It is freely available for all computer operating systems and smartphones.

All additional reading material and handouts will be available on Blackboard (through my.utep.edu). You MUST have a valid UTEP login and password to access my.utep.edu, Blackboard, and other relevant UTEP websites. A UTEP e-mail address is required for all e-correspondence and more effective communication.

VI. Technology Requirements

Course content is delivered via the Internet through the Blackboard learning management system. Ensure your UTEP e-mail account works and you can access the web and use a stable web browser. Google Chrome and Mozilla Firefox are the best browsers for Blackboard; other browsers may cause complications. When having technical difficulties, update your browser, clear your cache, or try switching to another browser. You will need access to a computer/laptop and scanner (which could be an app on your smartphone). You must download or update the software: Microsoft Office, Adobe Acrobat Reader, Windows Media Player, QuickTime, and Java. Check that your computer hardware and software are up-to-date and able to access all parts of the course. If you do not have word-processing software, you can download Word and other Microsoft Office programs (including Excel, PowerPoint, Outlook, and more) for free via UTEP's Microsoft Office Portal. Click the following link for more information about Microsoft Office 365 and follow the instructions.

We will also make use of the following technology tools to enhance your learning experience:

- Discussion boards (Blackboard Ultra, Teams)
- Multimedia creation platforms (Open Broadcaster Software, Canva)
- Collaborative tools (Microsoft Education, Microsoft Whiteboard, and MagicSchool AI)

VII. Inclusiveness and Equity

Learning happens only when we feel respected as a whole human being. My top priority in our classroom is to cultivate relationships of trust and respect and a sense that we see each other as whole, complex human beings. That you experience this in our classroom is essential for the sake of your learning in our course *and* your future students' learning so that you can cultivate such relationships with them. To that end, I want you to know that all of you are welcome in our classroom space—all the parts of you as a person are welcome in our discussions, our activities, our assignments, and our assessments. We are all complex people with a variety of perspectives, experiences, challenges, assets, and resources—our gender identities, our sexual orientations, our religions, our races, our ethnicities, our economic statuses, our immigration statuses, our parenthoods, our veteran statuses, our ages, our languages, our abilities, and disabilities. All the parts of you are welcome in our learning community to the extent that you feel comfortable bringing them in. I strive to show respect for the variety and wholeness in each of you, and I expect that each of you also shows respect for each other. If you feel marginalized in our class and you feel comfortable discussing it, I would like to know so that I can support you, protect you, and make changes that feel more inclusive and equitable. You can also talk with our Department Chair and/or report a discrimination complaint to the University's Equal Opportunity Office, Kelly Hall, Third Floor, 915-747-5662 or eoaa@utep.edu.

VIII. Standards of Academic Integrity

Students are expected to uphold the highest standards of academic integrity. Any form of academic dishonesty is an affront to the pursuit of knowledge and jeopardizes the quality of the degree awarded to all graduates of UTEP. Any student who commits an act of academic dishonesty is subject to discipline. Academic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are not attributable in whole or in part to another person, taking an examination for another person, any act designed to give an unfair advantage to a student or the attempt to commit such acts. Proven violations of the detailed regulations, as printed in the Handbook of Operating Procedures (HOP) and available in the Office of the Dean of Students, may result in sanctions ranging from disciplinary probation to failing grades on the work in question, to failing grades in the course, to suspension or dismissal among others.

IX. COVID-19 Precautions

Please stay home if you have been diagnosed with COVID-19 or are experiencing COVID-19 symptoms. If you feel unwell, please let me know as soon as possible so we can work on appropriate accommodations. If you have tested positive for COVID-19, you are encouraged to report your results to covidaction@utep.edu so that the Dean of Students Office can provide you with support and help with communication with your professors. The Student Health Center is equipped to provide COVID-19 testing.

The Center for Disease Control and Prevention recommends that people in areas of substantial or high COVID-19 transmission wear face masks when indoors in groups of people. The best way that Miners can care for Miners is to get the vaccine. If you still need the vaccine, it is widely available in the El Paso area and will be available at no charge on campus during the first week of classes. For more information about the current rates, testing, and vaccinations, please visit epstrong.org.

X. Students with Disabilities Statement

If you have or believe you have a disability, you may wish to self-identify. You can do so by providing documentation to the Center for Accommodations and Support Services (CASS) in Union E, Room 106. Students designated as having a disability must reactivate their standing with CASS every year. Failure to report to this office will place a student on the inactive list and nullify benefits received. If you have a condition that may affect your ability to exit safely from the premises in an emergency or that may cause an emergency during class, you are encouraged to discuss this in confidence with the instructor and the director of CASS. You may call 915-747-5148 for general information about the Americans with Disabilities Act (ADA).

XI. Evaluation & Coursework Requirements of Students:

Coursework Requirements	Points
Homework assignments – 5 x 20 pts	100
Discussion boards – 5 x 10 pts	50
Five hours of field experience with documentation – 5 x 10 pts	50
Field experience/observation reflection (20) with log form (15)	35
Lesson planning and design (25 pts) with lesson reflection (25 pts)	50
Attendance/Participation	15
TOTAL	300

How Grades Are Determined	
Grade	**Percentage (%)**
A	90 - 100
B	80 - 89.9
C	70 - 79.9
D	60 - 69.9
F	Below 60

XII. Course Assignments

1. Field Based Experience (FBE)/Observation Hours

To meet state requirements (TAC §228.35(b)(1)) and prepare for your future classrooms, this course includes a field-based experience (FBE) component consisting of **5 FBE/Observation hours**.

- **FBE/Observation Options:** You have two main pathways to fulfill this requirement:

    - **FBEs:** If you're currently working in a school setting as a resident or paraprofessional or student teacher, you can use your teaching experiences (e.g., delivering lessons, working with small groups, observing your mentor teacher) to complete your 5 hours.
    - **Video Observations:** Alternatively, you can complete 5 hours of video observation, focusing on mathematics instruction at different grade levels. I'll provide links to these videos throughout the semester.
- **Documentation:** No matter which option you choose, you'll document your FBEs/Observations. I'll provide you with a log sheet and observation note sheet/FBE report sheet on Blackboard.
- **Final Reflection:** At the end of the semester, you'll write a 2-page reflection summarizing your key takeaways from your 6 hours of FBEs/Observations. I'll provide a guide to help you with this.
- **Important Notes:**
    - **Deadlines:** Specific deadlines for submitting your documentation are provided in the course calendar.
    - **Certification:** All your documentation will be kept on file in the certification office in the Center for Student Success (CSS).

2. Discussion Boards

You will read chapters from the textbook and be asked to write a reflection on each reading assignment. Each discussion prompt will have a specific theme or topic related to lesson design in mathematics education. Each reflection will be posted on the discussion board. A rubric for your discussion board posts will be provided to you. Each initial response should be substantive (at least 200 words) and must be posted by midnight, Mountain Standard Time, on the evening BEFORE the due date. In your substantive posts, you are encouraged to use references (e.g., class notes and/or other resources I provide). Show evidence of critical thinking as it applies to the concepts or prompt and/or use examples of applying the concepts to education. Your replies should build on the concept discussed, offer a question to consider, add a different perspective, etc. YOU MUST RESPOND TO AT LEAST TWO OF YOUR CLASSMATES.

3. Homework Assignments

There will be short homework assignments, primarily skills-based, throughout the semester. They will be posted on Blackboard and due on specified dates. These assignments will reflect appropriate mathematics content for teaching and lesson topics for grades EC - 6 and the core of the content you should expect to see on standardized tests (including your certification test and the STAAR test).

4. **Final Project: Lesson Planning / Instructional Design (2 parts)**

   Part I: Design a lesson: You will be required to create a lesson plan for a given topic for a specific grade level that meets the following criteria: 1) it is appropriate for grades EC – 6; 2) it is aligned with selected Instructional Focus Documents (IFD) for mathematics as well as the Texas Bluebonnet curriculum; and 3) it is aligned with STAAR objectives as well as TEKS standards. I will approve the final topics and grade levels. You will receive constructive feedback through a written analysis from me.

   Part II: Reflect on your lesson design: You will write a Lesson Planning and Design Reflection by analyzing your lesson design. Final goals, guidelines, and a rubric for this assignment are provided as appendices in this syllabus and will also be available on Blackboard.

XIII. Course Requirements

1. **Attendance and participation:** Your attendance and active participation are crucial for your success in this course and for the collaborative learning environment we will build. This class is designed to be collegial, and your presence and contributions are essential to your group's efforts and our collective understanding of effective mathematics teaching. I will take attendance at the beginning of each face-to-face class session, and it will count toward your final grade. Being late or leaving early twice will be counted as one absence. More than two absences may result in a lower final letter grade. If you must miss a class, you are responsible for getting all missed information and completing all required work.

2. **Digital Citizenship and Professional Conduct**
   In this course, we are a learning community, and your active engagement is vital. Whether we meet face-to-face or online, professional conduct is expected at all times. This includes completing all assignments on time, contributing thoughtfully to discussions, and interacting with your classmates and me with professional courtesy. This is a safe space for open discussion and creative expression, so all information should be kept confidential. When participating in online discussions, please address ideas, not people, and avoid inappropriate language or texting shortcuts. Your posts should demonstrate a high level of academic writing. Late work will not be accepted, so please manage your time carefully. In the case of an extreme emergency, you must contact me ahead of time to discuss a potential exception. If a technical issue with the learning management system prevents you from submitting work on time, you must immediately email me your work as an attachment to receive credit.

3. **Accessibility to Your Instructor**
   I am here to support you in this course and want you to succeed. My email is the best way to reach me for questions or to schedule a meeting. You can expect a response from me within 24-48 hours. If you ever have difficulty understanding the course material or my expectations, please be proactive and contact me as soon as possible. Do not wait until the last minute. The sooner you reach out, the sooner we can work together to find a solution and ensure this class is a success for you.

4. **Due dates**: Assignments are due on the specified dates. Type or word-process written assignments. All assignments should be double-spaced with a 12-point font. Number your pages.

5. **Calendar changes:** The schedule of topics and reading assignments may change over the semester. Any changes to the syllabus will be announced in class. Every student is responsible for these changes.

XIV. Class Schedule

The following class schedule is SUBJECT TO CHANGE. Weeks highlighted in light gray are self-paced modules with NO face-to-face class meetings. **FTM** = *Foundations for Teaching Elementary and Middle School Mathematics*; **BRMT** = *Becoming a Reflective Mathematics Teacher.*

DATE	TOPICS	ASSIGNMENTS
Week 1 **August 27**	• Specialized knowledge for teaching • Epistemology of multiple representations • Learning progressions	**Introduction forum due** Podcast/Class Notes: Teaching Mathematics Through Activity FTM Chapter 1: A Fresh Perspective of Mathematical Literacy BRMT Chapter 1: Toward an Understanding of Student-Centered Teaching
	GRADES EC - K	
Week 2 **September 3**	• Counting concepts • Relative magnitude • Modeling addition and subtraction	Podcast/Class Notes: Number and Operations (Grades EC-K) FTM Chapter 3: Mathematical Foundations for Early Childhood and Kindergarten (pp. 27 – 44)
Week 3 **September 10**	• Attributes of shapes • Patterns • Part-part-whole relationships • Early measurement	**Discussion 1 due** Podcast/Class Notes: Geometry and Measurement (Grades EC-K) FTM Chapter 3: Mathematical Foundations for Early Childhood and Kindergarten (pp. 45 – 58) BRMT Chapter 2: A Framework for the Examination of Instructional Practice
	1st GRADE	
Week 4 **September 17**	• Developing base ten concepts • Introducing the number line and number sentences • Teaching money	**Homework 1 due** Podcast/Class Notes: Number and Operations (Grade 1) FTM Chapter 4: Mathematical Foundations for First Grade (pp. 63 – 79)
Week 5 **September 24**	• Sorting and classifying • Composing/decomposing shapes • Introducing fraction as measure • Measuring time	**Field experience/observation 1 due** **Discussion 2 due** Podcast/Class Notes: Geometry and Measurement (Grade 1) FTM Chapter 4: Mathematical Foundations for First Grade (pp. 80 – 89) BRMT Chapter 3: A Framework for the Examination of Teacher Cognitions
	2nd GRADE	
Week 6 **October 1**	• Composing/decomposing numbers • Base ten addition and subtraction • Models for fractions	**Homework 2 due** Podcast/Class Notes: Number and Operations (Grade 2) FTM -- Chapter 5: Mathematical Foundations for Second Grade (pp. 93 – 115)
Week 7 **October 8**	• Linear measure • Computational estimation • Introducing the double number line	**Field experience/observation 2 due** Podcast/Class Notes: Geometry and Measurement (Grade 2) FTM Chapter 5: Mathematical Foundations for Second Grade (pp. 115 – 120) (Revisited) BRMT Chapter 2: A Framework for the Examination of Instructional Practice

3rd GRADE		
Week 8 October 15	• Base ten concepts • Array models for multiplication and division • Fractions on the number line • Computational estimation	**Discussion 3 due 3/18** Podcast/Class Notes: Number and Operations (Grade 3) Chapter 6: Mathematical Foundations for Third Grade (pp. 123 – 139)
Week 9 October 22	• Attributes and quantities • Spatial reasoning • Area and volume	**Field experience/observation 3 due** **Homework 3 due** Podcast/Class Notes: Geometry and Measurement (Grade 3) FTM -- Chapter 6: Mathematical Foundations for Third Grade (pp. 139 – 150)
4th GRADE		
Week 10 October 29	• Decimal concepts • Models for whole number multiplication and division • Models for fraction operations • Prime factorization • Flow diagram for linear equations	**Discussion 4 due 4/1 by midnight** Podcast/Class Notes: Number and Operations (Grade 4) FTM -- Chapter 7: Mathematical Foundations for Fourth Grade (pp. 153 – 171) BRMT – Chapter 6: Examine Your Own Instructional Practice and Cognitions
Week 11 November 5	• Angle measure • Symmetry • Stem-and-leaf plots	**Begin Lesson Design project.** **Homework 4 due** Podcast/Class Notes: Geometry and Measurement (Grade 4) FTM Chapter 7: Mathematical Foundations for Fourth Grade (pp. 171 – 182) BRMT Chapter 6: Examine Your Own Instructional Practice and Cognitions
5th GRADE		
Week 12 November 12	• Rational number division • Overview of negative numbers • Linear relationships and representations	**Field experience/observation 4 due** Podcast and Class Notes: Number and Operations (Grade 5) FTM Chapter 8: Mathematical Foundations for Fifth Grade
Week 13 November 19	• The coordinate plane • Rational numbers and the double number line • The ratio box	**Discussion 5 due** **Field experience/observation 5 due** Podcast and Class Notes: Geometry and Measurement (Grade 5) FTM Chapter 8: Mathematical Foundations for Fifth Grade (pp. 207 – 220)
November 26	**THANKSGIVING WEEK – NO CLASS**	
6th GRADE		
Week 14 December 3	• Equivalent expressions • Inequalities • Square roots	**Homework 5 due** Podcast and Class Notes: Number and Operations (Grade 6) FTM Chapter 9: Mathematical Foundations for Sixth Grade (pp. 223 – 238)
Week 15 December 10	**EXAM WEEK NO CLASS MEETING**	**Field experience/observation logs and reflections due (all students)** **Lesson plans and lesson design reflections due (all students)**

APPENDIX A: UNDERSTANDING BY DESIGN - ACTIVE LEARNING LESSON PLAN GUIDE

This guide outlines the process you will use to design effective learning experiences. It serves as a blueprint to ensure that your lessons are engaging, focused, and designed to promote deep understanding. The guide involves several key stages:

- **Learning Goals:** You will identify the essential concepts students should understand, moving beyond rote memorization. You will also establish key questions to guide exploration of the topic.
- **Assessment Strategies:** You will detail how you will assess student learning. This includes a variety of methods, such as projects, presentations, and explanations, in addition to traditional assessments.
- **Instructional Plan:** You will develop a detailed plan of activities and steps to facilitate student learning. This plan clarifies what students will be doing, what you will be doing, and how all aspects of the lesson are interconnected.
- **Differentiation:** You will consider how to support all learners, including those who may need additional assistance or more challenging work.
- **Self-Reflection:** You will reflect on your own learning and comprehension throughout the lesson design process.

In essence, this guide provides a framework for you to create well-structured lessons that foster meaningful learning.

Title/Topic:
Grade Level:

Stage 1: Desired Results

- **Essential Questions:** (1-3 overarching, thought-provoking questions the lesson will explore)
  - Question 1:
  - Question 2: (Optional)
  - Question 3: (Optional)
- **Understandings:** (What specific "big ideas" should students understand as a result of this lesson? Express as complete sentences.)
  - Understanding 1:
  - Understanding 2: (Optional)
- **Goals and Objectives of your lesson:** (Be as specific as possible. Include the specific ideas and processes you hope to help your students develop and/or understand.)
  - Objective 1:
  - Objective 2: (Optional)
- **TEKS Standards:** (Provide specific, standard expectations for teaching the selected concept/procedures for selected grade level.)
  - Standard 1:
  - Standard 2: (Optional)

Stage 2: Evidence of Understanding

Assessment Technique(s): (Describe what you will do during the lesson to assess student understanding - formative assessment. Describe what you will do with the materials produced. Attach copies of any written assessments (tests, observational checklists, format for anecdotal records, rubrics). To ensure a comprehensive assessment of student understanding, please describe a variety of assessment methods, including both formative and summative approaches. For each assessment technique, specify how it aligns with the stated learning goals and objectives.

- **Formative Assessment Description:**
  - What specific strategies will you use to monitor student learning throughout the lesson?
  - What kind of feedback will you provide to students during the lesson?
  - How will these formative assessments inform your instructional decisions and adjustments during the lesson?
- **Summative Assessment Description:**
  - What culminating project, performance task, or written work will students produce to demonstrate their understanding of the learning goals and objectives?
  - How does this assessment task reflect real-world applications of the concepts or skills taught in the lesson?
  - What specific criteria will you use to evaluate student work (e.g., attach a rubric, checklist, or scoring guide)?

Stage 3: Learning Plan

- **Instructional Sequence:** (Outline the learning plan - teaching & learning activities.)
  - **List of instructional materials & resources:** (Include a variety of resources that you used in preparing the lesson.)
    - Resource 1:
    - Resource 2:
    - Resource 3: (Continue as needed)
  - **Introductory activities:** (Hook/capture (engage) student interest; setting up the task; relate to previous learning (review) and how this aligns with what is to follow; tell students what they will learn and be expected to do as a result of the lesson.)
    - Activity & Description: (Time Estimate)
  - **Developmental activities:** (Outline the content and outline the instructional strategies & learning activities. Include details what you will do, how you will organize/prepare students for tasks, and what students will do. For example, if you plan to involve students in discussion, list key/stem questions that you might ask to generate discussion.)
    - Activity 1 & Description: (Time Estimate)
      - Teacher Actions:
      - Student Actions:
      - Key/Stem Questions (if applicable):

        - Activity 2 & Description: (Time Estimate)
            - Teacher Actions:
            - Student Actions:
            - Key/Stem Questions (if applicable):
        - (Continue as needed)

    - **Closing activities:** (List activities that you & students will do to summarize the lesson, reinforce what was covered, and tie everything together so students see how the lesson fits into the context of what they have already done and what is coming next.)
        - Activity & Description: (Time Estimate)

    - **Differentiation:** (Describe how you will/could differentiate instruction to meet the diverse needs of your learners.)
        - For struggling learners:
        - For advanced learners:

Stage 4: Teacher Self Reflection

Analyze your **lesson design** or the structure of the lesson itself. When you think about the design of your lesson, you are mostly thinking about the plan before you put it into practice. Write a reflection (**giving specific examples from your lesson plan**), reflecting in-depth as you ask yourself the following questions. Your self-reflection must be <u>at least a full page in length, single spaced. You may reference and readings or notes that you wish.</u>

- **What is the purpose of this lesson?**

  Asking this question helps you ensure that you clearly understand your teaching objectives. If you can answer this question, you will know whether you have accomplished your goals at the end of the lesson.

- **What challenges do you foresee in teaching this lesson?**

  Thinking through potential obstacles in advance can help you redesign aspects of your lesson that might be especially difficult for students to access.

- **How are you addressing diversity?**

  This question helps you ensure that over the week, you build activities that meet the needs of the wide range of learners in front of you.

- **How will you know whether this lesson is practical?**

  Asking about efficacy in advance helps you prepare informal assessment tools that will allow you to understand whether students are grasping the content.

Appendix B: RUBRIC FOR ACTIVE LEARNING LESSON PLAN

Category	Exceeds Standard (5 pts)	Meets Standard (3 – 4 pts)	Does Not Meet Standard (0 – 2 pts)
Structure	The Lesson Plan format is concise, addresses universal design, and connects to student needs. It includes the elements of Active Learning, Inquiry-based, and TPACK, with differentiation that addresses prior knowledge, real-world connections, identified (data-driven) student strengths, and knowledge gaps.	The Lesson Plan format is somewhat concise, addressing universal design and making connections to student needs. Some elements of Active Learning, Inquiry-based and TPACK, are included, with differentiation that addresses prior knowledge, real-world connections, identified (data-driven) student strengths, and knowledge gaps.	The Lesson Plan format is disorganized and does not include components addressing universal design and making connections to student needs. The elements of Active Learning, Inquiry-based, and TPACK, with differentiation that addresses prior knowledge, real-world connections, identified (data-driven) student strengths, and knowledge gaps, are not included.
Content	The lesson structure states and addresses the Texas Essential Knowledge and Skills and Learning Objective. Active, constructive learning is promoted through discovery, critical-creative thinking, and challenging expectations. Error Analysis and self-reflection are promoted, resulting in student learning goal setting.	The lesson structure somewhat states and addresses Texas Essential Knowledge and Skills and Learning Objective. Active, constructive learning is primarily promoted through discovery, critical-creative thinking, and challenging expectations. Error Analysis and self-reflection are somewhat promoted, resulting in student learning goal setting.	Texas Essential Knowledge and Skills and Learning Objective are not stated and addressed in the lesson structure. Active, constructive learning is not promoted through discovery, critical-creative thinking, and challenging expectations. Error Analysis and self-reflection are not promoted and do not result in student learning goal setting.
Lesson Delivery Strategies	Strategies for lesson delivery include interactive, hands-on approaches and differentiated instruction to address individual student needs and learning styles. Formative evaluation is integrated to ensure content mastery (evidence-based). Lesson delivery is literacy-based and provides opportunities for engagement through cross-curricular connections and the integration of varied tools and technology.	Strategies for lesson delivery somewhat include interactive, hands-on approaches and differentiated instruction to address individual student needs and learning styles. Formative evaluation is somewhat integrated to ensure content mastery (evidence-based). Lesson delivery is somewhat literacy-based and provides some opportunities for engagement through cross-curricular connections and some integration of varied tools and technology.	Strategies for lesson delivery do not include interactive, hands-on approaches and differentiated instruction to address individual student needs and learning styles. Formative evaluation is not integrated to ensure content mastery (evidence-based). Lesson delivery is not literacy-based, does not provide opportunities for engagement through cross-curricular connections, and does not have integration of varied tools and technology.

Appendix C: RUBRIC FOR LESSON PLANNING & DESIGN REFLECTION

Criteria/Standard	5 - Exceeds expectations	4 - Meets Expectations	3 - Emergent	1-2 - Meets Minimum Expectations
Depth of Reflection	The response demonstrates an in-depth reflection on and personalization of the theories, concepts, and strategies in the lesson plan and implementation.	The response demonstrates a general reflection on and personalization of the theories, concepts, and strategies in the lesson plan and implementation.	The response demonstrates minimal reflection on and personalization of the theories, concepts, and strategies in the lesson plan and implementation.	The response demonstrates a lack of reflection on and personalization of the theories, concepts, and strategies in the lesson plan and implementation.
Viewpoints	Viewpoints and interpretations are insightful and well-supported. Clear, detailed examples are provided, as applicable.	Viewpoints and interpretations are supported. Appropriate examples are provided as applicable.	Viewpoints and interpretations are unsupported or supported with flawed arguments. When applicable, examples are not provided or irrelevant to the assignment.	Viewpoints and interpretations are missing, inappropriate, and unsupported. Examples, when applicable, are not provided.
Evidence and Practice	The essay shows strong evidence of synthesizing the ideas presented and the insights gained from this assignment. The implications of these insights for the respondent's overall teaching practice are thoroughly detailed.	The essay shows evidence of the synthesis of ideas presented and insights gained in this assignment. It also presents the implications of these insights for the respondent's overall teaching practice.	The essay shows little evidence of synthesis of the ideas presented and insights gained in this assignment. Few implications of these insights for the respondent's overall teaching practice are presented.	The essay shows no evidence of synthesis of the ideas presented and insights gained in this assignment. It does not present implications for the respondent's overall teaching practice.
Self-Evaluations	Self-evaluation shows personal development related to goals set for this assignment.	Self-evaluation shows an assessment of progress connected to goals set for this assignment.	Self-evaluation shows evidence of assessment of progress connected to goals set for this assignment. However, they are not specific.	Self-evaluation is generalized, superficial, and not connected to the goals set for this assignment.
Mechanics	The writing is clear, concise, and well-organized, and the sentence/paragraph construction is excellent. Thoughts are expressed coherently and logically. There are no more than three spelling, grammar, or syntax errors per writing page.	Writing is mostly clear, concise, and well organized, with good sentence/paragraph construction. Thoughts are expressed coherently and logically. There are no more than five spelling, grammar, or syntax errors per writing page.	Writing is unclear and disorganized. Thoughts are not expressed logically. There are more than five spelling, grammar, or syntax errors per writing page.	Writing is unclear and disorganized. Thoughts ramble and make little sense. There are numerous spelling, grammar, or syntax errors throughout the response.