



CUIN 6397 Developing Number Concepts

Standard I: Number Concepts: The Master Mathematics Teacher understands and applies knowledge of numbers, number systems and their structure, operations and algorithms, quantitative reasoning, and the vertical alignment of number concepts to teach the statewide curriculum (Texas Essential Knowledge and Skills [TEKS]).

Standard VI: Instruction: The Master Mathematics Teacher applies knowledge of mathematical content, uses appropriate theories for learning mathematics, implements effective instructional approaches for teaching mathematics, including teaching students who are at-risk, and demonstrates effective classroom management techniques.

Standard VII: Creating and Promoting a Positive Learning Environment: The Master Mathematics Teacher demonstrates behavior that reflects high expectations for every student, promotes positive student attitudes towards mathematics, and provides equitable opportunities for all students to achieve at a high level.

Standard VIII: Assessment: The Master Mathematics Teacher selects, constructs, and administers appropriate assessments to guide, monitor, evaluate, and report student progress to students, administrators, and parents, and develops these skills in other teachers.

Standard IX: Mentoring and Leadership: The Master Mathematics Teacher facilitates appropriate standards-based mathematics instruction by communicating and collaborating with educational stake-holders; mentoring, coaching, exhibiting leadership, and consulting with colleagues; providing professional development opportunities for faculty; and making instructional decisions based on data and supported by evidence from research.

T.E.K.S.: (4.1 – 4.5); (5.1 – 5.4); (6.1) & (6.1); (7.1) & (7.2); (8.1) & (8.2)

Course Description & Assessment Methodology for Course Objectives

CUIN 6397, Developing Number Concepts, is designed for Curriculum and Instruction M.Ed and Ed.D students seeking an emphasis in mathematics education. It is designed to help gain expertise and leadership regarding how children develop number concepts and the corresponding instructional and assessment practices that facilitate this development. It is also designed to expand students’ understandings of the structure of number systems, the relationship between quantity and symbolic representations, and ideas of number theory. Small-group number concept-related activities involving appropriate uses of technology, electronic discussions, student presentations, and analysis of practice-related artifacts are important instructional strategies that will be utilized in this course.

The Student of CUIN 6397 will	Key Course Assignments
Understand the structure of number systems, the development of a sense of quantity, and the relationship between quantity and symbolic representations.	Graded HW 3-5 Mathematics Assessments Midterm Exam Final Exam
Understand number operations and computational algorithms.	
Understand ideas of number theory and use numbers to model and solve problems within and outside of mathematics, using technology as	

appropriate.	
Plan and design effective instruction and assessment based on knowledge of how all students including students who are at-risk, learn and develop number concepts, skills, and procedures.	TEKS Alignment Lesson Plan Analysis Unit Exam Analysis
Implement a variety of instruction and assessment techniques to guide, evaluate, and improve students' learning of number concepts, skills, and procedures.	Task-based Interview Video Analysis (1) (Fall & Spring semesters only) Midterm Exam/Final Exam
Understand the role of video-analysis as a professional development tool;	Video Analysis (2)

Mathematics Assessments (Competencies 1-3, 24 & 25): 3-5 mathematics assessments

Mathematics Education Assignments (Competencies 4 & 5)

TEKS Alignment: In collaborative teams, teachers examine and critique the K-12 TEKS regarding number concepts in light of 1) recommendations by the National Council of Teachers of Mathematics *Principles and Standards*, 2) current research about how children develop number concepts and 3) as it relates to the development of proportional reasoning concepts. In addition, where applicable, they participate in activities of examining TAKS items designed to measure said TEKS (e.g., Chauvot & Benson, 2008).

Criteria to assess the TEKS Alignment Assignment: This assignment is evaluated on the extent to which the MMT candidates accurately identify strengths and weaknesses of the TEKS, provide rationales supported by relevant research, and correctly identify proportional reasoning concepts.

Lesson Plan Analysis: MMT candidates will analyze lesson plans from practice in light of course readings about how children develop number concepts.

Criteria to assess the Lesson Plan Analysis Assignment: This assignment is evaluated on the extent to which the MMT candidates accurately identify strengths and weaknesses of the lesson plans and to which they provide rationales supported by relevant research.

Unit Exam Analysis: MMT candidates submit and exchange unit exams from practice. They examine and apply frameworks (e.g., Kastberg (2003)) for analyzing classroom assessments. They submit the analysis, the test and suggested revisions.

Criteria to assess the Unit Exam Analysis Assignment: This assignment is evaluated on the extent to which the MMT candidates accurately classify the items and to which they provide appropriate revisions.

Task-Based Interview: Drawing from the TEKS Alignment Assignment (above), MMT candidates conduct and analyze an audio-taped task-based interview with a grade 4-8 child that relates to both development of proportional reasoning concepts and number concepts. Equipment for this assignment is available in the College of Education CITE lab.

Criteria to assess the Task-Based Interview Assignment: This assignment is evaluated on the extent to which the MMT candidates support claims about the child's thinking with evidence from the interview and the extent to which the MMT connects the child's thinking to relevant literature.

Video Analysis (1): The MMT candidate captures 20-40 minutes of his or her instructional practices and analyzes his or her teaching in terms of criteria brought forward in the respective course. Equipment for this assignment is available in the College of Education CITE lab.

Criteria to assess the Video Analysis (1) Assignment: This assignment is evaluated on the extent to which the MMT candidates address relevant criteria and support claims about the instruction with evidence from the video.

Video Analysis (2): With his or her campus administrator or supervisor, the MMT candidate explores the role of video analysis as a forum for mentoring/coaching mathematics teachers. The MMT candidate will maintain a log and submit a brief report of available video resources, including district and school-level logistics for videotaping in classrooms.