

EDMS 543B
Teaching Mathematics in the Elementary School
 Wednesday 1:00- 3:45 University Hall 439
 Fall 2001

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The mission of the College of Education Community is to transform public education by preparing thoughtful educators advancing professional practice. We are committed to the democratic principles of educational equity and social justice for all learners, exemplified through reflective teaching, learning and service. We value diversity, collaboration, professionalism and shared governance.

Required Materials:

- Van de Walle, J. A. (2000). Elementary School Mathematics: Teaching Developmentally (Fourth Ed.). New York: Longman.
- California Department of Education (1999). Mathematics Content Standards for California Public Schools, Kindergarten Through Grade Twelve. Sacramento, CA: author. This document can be found on the WWW at: http://www.cde.ca.gov/board/mcs_intro.html (I highly encourage students to purchase this publication).
- National Council of Teachers of Mathematics (2000). Principles and standards for school mathematics. Reston, VA: author. This document can be found on the WWW at: <http://standards.nctm.org/>
- Star Test Blueprints for Standards Items (<http://www.cde.ca.gov/statetests/star/s2blueprt.html>)

Recommended Materials (Optional):

- Hiebert, J., Carpenter, T. P., Fennema, E., Fuson, K. C., Wearne, D., Murray, H., Olivier, A., & Human, P. (1997). Making Sense: Teaching and Learning Mathematics with Understanding. Portsmouth, NH: Heinemann.

COURSE GOALS

EDMS 543B is a mathematics "methods" course. Most of the course is focused on how to *teach* mathematics to elementary school students. Although techniques for solving specific types of problems will be taught, the major focus of the course is on *how elementary students learn mathematics* and thus what can be done to help them *understand* the mathematical concepts they are expected to master. With these points in mind, the specific goals of EDMS 543B are as follows:

1. Students who complete EDMS 543B should see elementary school mathematics as a discipline involving exploring, verifying, conjecturing, describing, and so on. Specifically, those who complete EDMS 543B should be able to help elementary school students to solve word problems, to apply mathematical thinking to non-routine mathematical questions, and to understand the computational techniques they are learning.
2. Students who complete EDMS 543B should understand how elementary school students learn mathematics. It is only by understanding how students *construct* their own knowledge of mathematics that we can understand how best to teach them.
3. Students who complete EDMS 543B should be aware of specific mathematical topics taught in each of the grades K through 6 and know where to gather resources to aid in the teaching of those topics. Moreover, students should be able to find or create mathematical *tasks* that help lead to understanding of more general concepts.
4. Students who complete EDMS 543B should be able to engage students in mathematical discourse to help them understand mathematical ideas. In particular, they should know how the tasks they expect students to complete relate to the discourse that takes place.
5. Students who complete EDMS 543B should be able to design a classroom environment that fosters the development of mathematical thinking. One key to this environment is appropriate tools including manipulatives, calculators, the world wide web, and paper and pencil.
6. Students who complete EDMS 543B should be able to assess progress of elementary school students who are learning mathematics and be able to adjust instruction for students with special needs.
7. Students who complete EDMS 543B should be able to communicate verbally about teaching and learning mathematics and work cooperatively on projects relating to teaching.
8. Students who complete EDMS 543B should understand what it means to be mathematically literate in a world that relies on calculators and computers to carry out mathematical procedures. In particular, students should be able to use these technological tools to develop elementary students' understanding of mathematics concepts.
9. Students who complete EDMS 543B should be able to aware of the multicultural composition of today's classrooms, and be able to teach elementary school mathematics to diverse populations.

CLAD EMPHASIS

In 1992, the College of Education voted to infuse Crosscultural, Language and Academic Development (CLAD) competencies across the curriculum. The CLAD competencies are attached to the syllabus and the competencies covered in this course are highlighted.

TENTATIVE COURSE OUTLINE

Topic and Assignments:

- Aug. 29 Teaching Mathematics in the Context of Reform (Van de Walle 1; Hiebert 1)
Appropriate mathematical tasks (Hiebert 2)
California Mathematics Standards (handout)
- Sept. 5 Technology and School Mathematics (Van de Walle 24)
Mathematics Websites
Exploring What It Means to Do Mathematics (Van de Walle 2)
Manipulatives: Unifix Cubes, Multilink Cubes, Color Cubes, Two-Color Counters, Tangrams
Begin WWW project
- Sept. 12 Cognitively Guided Instruction (handout and video)
Teaching through problem solving (Van de Walle 4)
Using manipulatives to teach patterning
Manipulative: Attribute Blocks, Pattern Blocks
- Sept. 19 Meaning of Operations (Van de Walle 7)
Teaching basic facts (Van de Walle 8)
Begin Lesson Plan
- Sept. 26 **WWW Group Report Due**
Classroom management (supplemental reading)
Whole Number Place Value Development (Van de Walle 9)
Teaching place value and computation in a real-world context (Hiebert 7)
Manipulatives: Base-Ten Blocks, Bundling Sticks, Unifix Cubes
- Oct. 3 Number Sense and Estimation with Whole Numbers (Van de Walle 11)
Computation in context (Hiebert 8)
- Oct. 10 Mathematics in other countries (TIMSS supplemental reading, Videotape)
Strategies for Whole Number Computation (Van de Walle 10)
Teacher's role in a mathematics class (Hiebert 3)
- Oct. 17 Social culture of the classroom (Hiebert 4)
Building Assessment into Instruction (Van de Walle 5)
SAT 9 testing
Summary of using tools to teach mathematics (Hiebert 5)
Developing Concepts of Ratio and Proportion (Van de Walle 15)
- Oct. 24 **Lesson Plan Due**
Begin Menu Project

- Oct. 31 Developing Fraction Concepts (Van de Walle 12)
Manipulatives: Cuisenaire Rods, Fraction Circles, Fraction Bars, Decimal Squares

- Nov. 7 Equity Issues (Hiebert 6; Van de Walle 23)
Video- Key School
Card Activity

- Nov. 14 Geometric Thinking and Geometric Concepts (Van de Walle 17)
Manipulatives: Tangrams
The Story of Tang

- Nov. 21 Work Menu Group projects

- Nov. 28 **Menu Group Project Due**
Helping Children Master the Basic Facts (Van de Walle 8)

- Dec. 5 Algebraic Reasoning (Van de Walle 19)
NCTM Navigations Series

- Dec. 12 **Final Project Case Study Due**
Course summary

GRADING POLICIES

Grading Standards:

Grading is calculated on the standard of

94 - 100 = A	80 - 83 = B-	70 - 73 = C-
90 - 93 = A-	77 - 79 = C+	60 - 69 = D
87 - 89 = B+	74 - 76 = C	below 60 = F
84 - 86 = B		

You must maintain a B average in your teacher education courses.

"A" is representative of outstanding performance and "it is virtually impossible to prespecify all details necessary to achieve a given grade." In addition, the guidelines state that "Students should recognize that effort alone does not necessarily guarantee above average grades." Note that I will provide grading rubrics for all assignments ahead of time in an attempt to be as specific as possible about what I expect on assignments.

Attendance and Class Participation: Due to the dynamic and interactive nature of EDMS 543B, all students are expected to attend all classes and participate actively. At a minimum, students must attend more than 80% of class time or she/he may not receive a passing grade for the course

at the discretion of the instructor. If you miss two class sessions or are late (or leave early) more than three sessions, you cannot receive a grade of "A". If you miss three class sessions, your highest possible grade is a "C+". Should you have extenuating circumstances, contact the instructor as soon as possible. I will record attendance and make notes to myself about class participation. Attendance and class participation is worth 10% of your overall grade.

Class Participation: You will be asked to participate in discussions in class. You will receive a grade for class participation totaling 10% of your overall class grade.

Lesson Plan: You will be asked to create a lesson plan aligned with the California Standards for Mathematics. A template will be given out in class. This lesson plan is worth 20 % of your overall grade.

Group Projects: You will be asked to complete two group projects. The first project involves creating lessons based on world wide web resources for teaching elementary and middle school mathematics. This project is worth 20 % of your overall grade and can be done in groups of 2 or 3. The second which involves creating a menu (learning center), can be done in pairs, and is worth 20 % of your overall grade.

Final Paper: You will be asked to write about how well one of the students you worked with in the field experience mastered the topic you were trying to teach. The paper should be five to seven pages in length and will be worth 30% of your overall grade. Grading will be based both on how well you are able to describe the student you wrote about and on the quality of the writing.