CHAMINADE UNIVERSITY OF HONOLULU FALL DAY 2001
Math Curriculum & Methods **ED 44501**
Aug 21 -Dec 11, 2001 5:45pm - 8:45pm
Instructor: Dr. Louise Bogart 395-2763(h)
Office Hours: M 2-5; T 11-12:30; W 1-4 735-4859(o)
email address lbogart@chaminade.edu or boghi2@cs.com

RATIONALE

The National Council of Teachers of Mathematics (NCTM) states that "knowing math is doing math". This applies to all levels of instruction Pre-K through 12. In this spirit, the course focuses on helping pre-service teachers learn how to provide experiences through which children can construct their own knowledge understanding of the math concepts that are appropriate for students in grades K-3. Research indicates that students need to talk about how they are thinking about math as they construct their own knowledge, therefore, emphasis is on student involvement in their own learning through learning centers and cooperative learning strategies. This emphasis begins with the adults in this class.

INSTRUCTIONAL OBJECTIVES

1. To examine current research on how children learn math and on constructivism and to show how that knowledge applies to classroom practice.
2. To help students become aware of the NCTM and Hawaii standards and discuss implications for practice. 3. To present a math sequence using manipulative models, in order to help students learn the math concepts that are the foundation of math curriculum.
4. To facilitate the development of the skills necessary to design and present developmentally appropriate math activities and lessons to children K through grade 3.
5. To facilitate the development of the knowledge and skill needed to sequence math learning experiences for children K through grade 3.
6. To provide opportunities for students to learn to write lesson plans for NCTM content standards.
7. To provide a constructivist learning environment, with a math learning center as a model, that incorporates cooperative learning, small group, and manipulative strategies.
8. To explore the management implications of using learning centers, manipulatives, cooperative learning, and small group strategies.
9. The explore appropriate uses of technology in K-3 classrooms.
10. To explore a variety of authentic assessment tools appropriate to constructivist learning strategies.
11. To facilitate the adult learner's understanding of and appreciation for how (s)he learns and thinks about math.
12. To provide students with an opportunity to further develop their writing skills as they write logs describing their observations and experiences with the implementation of NCTM standards and constructivist learning theory in local schools.

STUDENT OUTCOMES

Upon successful completion of this course, students will be able to:

1. apply current research on how children learn math and on constructivism to their own teaching practice;
2. write lesson plans that implement NCTM standards into their own practice;
3. demonstrate math concepts using manipulative models;
4. design and create developmentally appropriate math activities for children K through grade 3;
5. set up a learning center with a sequence of math learning activities that is appropriate for children K - 3;
6. Integrate appropriate technology into a K-3 classroom;
7. employ appropriate management strategies to facilitate cooperative learning, use of learning centers and of manipulative math materials to involve students in their own learning process;
8. create an environment in which children construct their own knowledge and understanding of math concepts;
9. employ authentic assessment models that are appropriate for "doing math" with manipulatives;
10. demonstrate and understanding of the way they themselves learn and think about math;

11. describe experiences in local schools in terms of the NCTM standards and constructivist learning theory.

TEXT

Van De Walle, John, Elementary And Middle School Mathematics, Fourth Edition. Longman Publishing Company. This text presents ideas appropriate for all levels. ISBN # 0-8013-3253-2

METHODS

Lecture	Videos	Quizzes
Demonstration	Portfolio	Student Presentations
Discussion	Research	Logs
Discovery	Lab Activities	Lesson Plans

COURSE REQUIREMENTS AND EVALUATION

Attendance	45 points	8
Participation	45 points	8%
Chapter Questions (88)	70 points	13%
Lesson plans	225 points	42%
O and P Logs (3)	15 points	3
Portfolio with lesson plans illustrated	100 points	19%
Rationale	10 points	2
Self evaluation	10 points	2%
Student Presentation	15 points	3
Total	535 points	100

GRADES

482-535	A	Superior
428-481	B	Excellent
375-427	C	Average (dangerous territory must earn a "B" in education courses)
321-374	D	
Below 321	F	

Superior work includes, but is not limited to:

1- full attendance
2- outstanding participation in labs and discussions
3- all assignments turned in on time
4- all written work
   a- uses correct spelling, punctuation, grammar, etc
   b- is written in a style that is concise and reflects clear thinking, a clearly identified main point or theme, and is well organized
   c- demonstrates reflection, analysis, evaluation, and application where appropriate
   d- is presented professionally and aesthetically.

ASSIGNMENTS AND RUBRICS FOR EVALUATION

1. It is important to attend every class. Full ***allendance*** means being on time for class as well as returning after breaks and staying until the end of class. Students should remember that one 3 hour class session

is the equivalent of three regular classes. Therefore, one absence means that you have missed three classes and would necessitate withdrawal. **3pts/class** for full attendance

2. Not only is attendance required, full participation is equally important. Students will earn points for coming to class prepared to discuss the reading material, participation in large and small group discussions, and in lab activities. Full attendance is necessary in order to earn full participation points. 3 pts/class for full participation
3. Chapter questions on assigned readings are due for each class. 1 point for turning assignment in on time; 1 point for correct grammar, syntax and spelling; 3 points for content, and quality and succinctness in expressing ideas. 5 points possible each week
4. Students will turn in lesson plans for the NCTM standards that go with class work. The lesson plan to be used is the complete elementary format. 1 point for turning in on time, l point for completeness of format, 3 points for appropriately addressing the standard. 5 points possible for each
5. Students are expected to complete three observations and write three logs during the course of this semester. Each must focus on children's and/or teacher interactions with and use of math materials. Follow the O&P log format in the Teacher Education Handbook (THE). If you are unable to observe constructivist lessons that meet the NCTM standards in your O&P placement, please contact the instructor for alternative placements. 5 points possible for each
6. Assemble a portfolio which contains lesson plans and illustrations for each of the 45 K-2 NCTM standards listed in Appendix A of your textbook. Activities in the lesson plans are to be appropriate for placement in learning centers for children to use as they construct their own understanding of math concepts. Each section is worth 15 points and will be assessed 5 points for aesthetics, 10 points for completeness. 25 points will be awarded for turning the portfolio in on time. 100 points possible
7. The portfolio should begin with a rationale statement that demonstrates your understanding of why it is important to follow the philosophy and methodology presented in this class. The focus of this rational should be from current research, State of HI content and performance standards, and/or NCTM standards. 10 points possible
8. The portfolio should contain a self-evaluation indicating how well you think you functioned in the class, the level of effort expended both in and out of class, and what grade you think you deserve and why. Also include an assessment of your own learnings for half of the points. 10 points possible
9. Students will create a math material to go with one of the lesson plans for NCTM standards and present the lesson to the class. Evaluation will be as follows: 1 point for creativity, 1 point for aesthetics, 2 points for developmental appropriateness of material, 3 points for developmental appropriateness of presentation, 4 points for the presentation itself, 1 point for stage presence, and 3 points for adequately addressing the standard chosen. Students will also participate in the evaluation. 15 points possible

This is a competency based course which means that the focus is on ensuring that students learn the content of this course well enough to feel comfortable teaching the concepts presented therein. Therefore, students may rework and resubmit work as many times as is necessary, within the time frame of the course, to achieve this outcome.

COURSE OUTLINE AND CONTENT

Aug 28	Introductions Getting to know you Pre-Test Syllabus/Orientation to course Math and the Reform Movement Discussion of Chapter 1 Presentation of Appendices A and B
Assignment: due 9/4	Read: Chapters 1, 2, and 3 Write: Answers to questions indicated on assignment page Write: Solutions to problems presented in Chapters 2 and 3
Sept 4	Doing and Understanding Math Discussion of Chapters 2 and 3 Sharing solutions to problems in Chapters 2 and 3 Activities for Chapters 2 and 3
Assignments due 9/11	Read: Chapters 4 and 5 Write: Answers to questions indicated on assignment page Write: Solutions to problems presented in Chapters 4 and 5
Sept 11	Problem Solving Discussion of Chapter 4 Sharing solutions to problems in Chapter 4 Activities for Chapter 4
Assignments due 9/18	Read: Chapter 5 Write: Answers to questions indicated on assignment page Write: Solutions to problems presented in Chapter 5
Sept 18	Assessment Discussion of Chapter 5 Sharing solutions to problems in Chapter 5 Activities for Chapter 5
Assignments	Read: Chapter 6

due 9/25 Write: Answers to questions indicated on assignment page
Write: Solutions to problems presented in Chapter 6

Sept 25 Early Number Concept and Number Sense
Discussion of Chapter 6
Sharing solutions to problems in Chapter 6
Activities for Chapter 6
Assignments Read: Chapter 9
due 10/2 Write: Answers to questions indicated on assignment page
Write: Solutions to problems presented in Chapter 9
Prepare: Four (4) Lesson Plans for Standard 1 #1,3,4,5 of Number and Operations in Appendix A

Oct 2 Place Value Concept Development
Discussion of Chapter 9
Sharing solutions to problems in Chapter 9
Activities for Chapter 9
Assignments Prepare: One (1) lesson Plan for content standard 1 #2 of Number and Operations due 10/9 in Appendix A
Read: Chapters 7 and 8
Write: Answers to questions indicated on assignment page
Write: Solutions to problems presented in Chapters 7 and 8

Oct 9 Operations and Basic Facts
Discussion of Chapters 7 and 8
Sharing solutions to problems in Chapters 7 and 8
Activities for Chapters 7 and 8
Assignments Prepare: Three (3) Lesson Plans for Standard 2 of Number and Operations in
due 10116 Appendix A
Read: Chapters 10 and 11
Write: Answers to questions indicated on assignment page
Write: Solutions to problems presented in Chapters 10 and 11

Oct 16 Computation and Estimation
Discussion of Chapters 10 and 11
Sharing solutions to problems in Chapters 10 and 11
Activities for Chapters 10 and 11
Assignments Prepare: Three (3) Lesson Plans for Standard 3 of Number and Operations in
due 10/23 Appendix A
Read: Chapter 12
Write: Answers to questions indicated on assignment page
Write: Solutions to problems presented in Chapter 12

Oct 23 Developing Fraction Concepts
Discussion of Chapter 12
Sharing solutions to problems in Chapters 12
Activities for Chapters 12

Assignments due 10/30	Read: Chapter 13 Write: Answers to questions indicated on assignment page Write: Solutions to problems presented in Chapter 13 Prepare: One (1) Lesson Plan for Standard 1 # 6 of Number and Operations in Appendix A
Oct 30	Computation with Fractions Discussion of Chapter 13 Sharing solutions to problems in Chapter 13 Activities for Chapter 13
Assignments due 11/6	Read: Chapter 16 Write: Answers to questions indicated on assignment page Write: Solutions to problems presented in Chapter 16
Nov 6	Development Measurement Concepts Discussion of Chapter 16 Sharing solutions to problems in Chapter 16 Activities for Chapter 16
Assignments in Appendix A	Prepare: Eight (8) Lesson Plans for Content Standards 1 and 2 of Measurement
due 11/13	Read: Chapter 17 Write: Answers to questions indicated on assignment page Write: Solutions to problems presented in Chapter 17
Nov 13	Geometric Thinking and Geometric Concepts Discussion of Chapter 17 Sharing solutions to problems in Chapter 17 Activities for Chapter 17
Assignments due 11/20	Read: Chapter 19 Write: Answers to questions indicated on assignment page Write: Solutions to problems presented in Chapter 19 Prepare: Twelve (12) lesson Plans for Content Standards 1,2,3 and 4 of Geometry in Appendix A
Nov 20	Algebraic Reasoning Discussion of Chapter 19 Sharing solutions to problems in Chapter 19 Activities for Chapter 19
Assignments due 11/27	Read: Chapter 18 Write: Answers to questions indicated on assignment page Write: Solutions to problems presented in Chapter 18 Prepare: Eight (8) Lesson Plans for content Standards 1,2,and 3 of Algebra in Appendix A
Nov 27	Exploring concepts of Probability and Data Analysis Discussion of Chapter 18 Sharing solutions to problems in Chapter 18

	Activities for Chapter 18
Assignments due 11/27	Read: Chapters 22 and 23 Write: Answers to questions indicated on assignment page Write: Solutions to problems presented in Chapters 22 and 23 Prepare: Five (5) Lesson Plans for content standards 1, 2, and 3 of Data Analysis and Probability in Appendix A
Dec 4	Planning for Effective Instruction for ALL Children Discussion of Chapters 22 and 23 Sharing solutions to problems in Chapters 22 and 23 Activities for Chapters 22 and 23
Assignments due 12/11	Read: Chapter 24 Write: Answers to questions indicated on assignment page Write: Solutions to problems presented in Chapter 24
Dec 11	Technology and School Mathematics Discussion of Chapter 24 Sharing solutions to problems in Chapter 24 Activities for Chapter 24

PORTFOLIO DUE

THIS SYLLABUS WILL BE MODIFIED AS NECESSARY TO MEET STUDENT NEEDS.

NAME DATE

ETHNICITY AGE

Number of EDUCATION courses previously taken This semester?

1-Specify some points of the current research on how children learn math and how you might apply it in your own teaching.

2- Explain the basic elements of constructivist theory and how they might apply to your own teaching.

3-State three NCTM or Hawaii content standards for K-3 math and explain implications for practice.

4. List a sequence of math activities, indicate the concept being taught by each activity and what manipulative you might provide students to help them understand each particular concept.

5-How would you design and create developmentally appropriate math activities/experiences for children K to grade 3?

6-Draw a model of a math learning center and indicate the sequence in which the materials would appear to be appropriate for children K through grade 3.

7-What management strategies can be employed to facilitate cooperative learning, use of learning centers and of manipulative math materials to involve children K through grade 3 in their own learning?

8-Describe an environment in which children construct their own knowledge and understanding of math concepts.

9-What types of authentic assessment are appropriate for "doing math" with manipulatives?

10. What have you learned about how math works?

11-Discuss what you know about how YOU learn and think about math and how this knowledge will affect your teaching.

12-Discuss one O&P experience that demonstrated attention to NCTM and Hawaii content standards as well as constructivist learning theory.

13. What kind of technology might you use to teach math in grades K-3? How would you use it?

CHAPTER QUESTIONS

Chapter 1	3 and 5
Chapter 2	1-5
Chapter 3	1-6
Chapter 4	1-4, 8 and 9
Chapter 5	2-7
Chapter 6	1, 2,3 (no activities), 4,5,7 and 8
Chapter 7	1-4, and 8
Chapter 8	1,2,9,10, and 11
Chapter 9	1-5
Chapter 10	Choose any 5

Chapter 11	3,5 and 6
Chapter 12	3,4,8, and 10
Chapter 13	3
Chapter 16	1,2,3, and 5
Chapter 17	4,5,7,8, and 9
Chapter 18	7,8, and 9
Chapter 19	1, 4 (next two patterns), 5, and 9
Chapter 22	1,2,3,7,and 9
Chapter 23	1,2,4,5, and 6