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CHAMINADE UNIVERSITY OF HONOLULU — SPRING DAY 2000
Math Curriculum & Methods — ED 44501
Jan 18 - May 9, 2000 2:00pm - 5:00pm
Instructor: Louise Bogart — 395-2763(h)
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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 math concepts presented from Early Childhood through grade 3 and how to teach them using man ipulatives and providing experiences through which children can construct their own understanding. 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 development and learning and show how that knowledge applies to classroom practice.
2. To make students aware of the NCTM guidelines and discuss implications for practice.
3. To resent the Montessori math sequence and materials for Early Childhood, as well as other 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 Pre-K through grade 3.
5. To facilitate the development of the knowledge and skill needed to sequence math learning experiences for children Pre-K -grade 3.
6. To provide a constructivist learning environment, with a math learning center as a model, that incorporates cooperative learning, small group, and manipulative strategies.
7. To explore the management implications of using learning centers, manipulatives, cooperative learning, and small group strategies.
8. To explore a variety of assessment tools appropriate to constructivist learning strategies.
9. To facilitate the adult learner's understanding of and appreciation for how (s)he learns and thinks about math.
10. 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 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 to their own teaching practice;
2. implement NCTM standards into their own practice;
3. demonstrate math concepts using Montessori math materials or other manipulative models;
4. design and create developmentally appropriate math activities for children Pre-K -grade 3;
5. set up a learning center with a sequence of math learning activities that is appropriate for children Pre-K -grade 3;
6. 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;
7. create an environment in which children construct their own knowledge and understanding of math concepts;
8. employ alternative assessment models that are appropriate for "doing math" with manipulatives;
9. discuss the way they learn and think about math;
10. discuss their experiences in local schools in terms of the NCTM guidelines and constructivist learning theory.

TEXT

Van De Walle, John, Elementary And Middle School Mathematics, Third Edition. Longman Publishing Company. This text presents ideas appropriate for all levels ISBN # 0-8013-1866-1

Lesson Plan Packets

METHODS

Lecture	Videos
Demonstration	Portfolio
Discussion	Research
Discovery	Lab Activities

COURSE REQUIREMENTS AND EVALUATION

Attendance	45 points	12%
Participation	45 points	12%
Reflection On Chapters (12)	60 points	16%
Quizzes (12)	60 points	16%
Weekly lesson plans (13)	39 points	9%
O and P Logs (3)	15 points	4%
Portfolio with lesson plans illustrated	60 points	16%
Rationale	10 points	3%
Self evaluation	10 points	3%
Student Presentation	10 points	3%
Performance Final	10 points	3%
Written Final	10 points	3%
Total	374 points	100%

GRADES

337-374	A	Superior
300-336	B	Excellent
262-299	C	Average (dangerous territory - must maintain a "B" average in education courses)
225-261	D	(Must repeat course)
Below 225	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 attendance*** means being on time for class as well as returning after breaks and staying until the end of class. Students should remember that one class session on an accelerated schedule is the equivalent of four regular classes. More than one absence 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 reflections*** on assigned readings are due for each class. They should be a minimum of one and no more than two double spaced pages. 1 point for turning assignment in on time, 1 point for correct grammar, syntax and spelling; 3 points for content, quality of arguments, and quality and succinctness of expressing ideas. 5 points possible for each

4. At the beginning of each class session, a ***quiz*** will be given on the readings. Points will be allocated as follows: 3 for completeness of response, 1 for quality of expression, I for organization of thoughts/ideas. 5 points possible for each

5. Each week students will turn in ***lesson plans*** for the previous weeks lab experiences. For the lessons that are provided in the bookstore packet, students are expected to make comments using the guidelines on page 36 in the text. Lesson plans not provided in the packet are to be written by students. 1 point for turning lessons plans in on time, 1 point for correct sequence, 1 point for comments or student written lesson plan. 3 points possible each week

6. 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 appropriate program format for O&P logs. S points possible for each

7. Assemble a portfolio which contains all lessons that were part of the lab experience as well as other activities that are appropriate for placement in learning centers for children to use as they learn and reinforce math concepts. Each section is worth 4 points and will be assessed 1 point for aesthetics, 1 Point for completeness, 1 point for sequence, and 1 point for student notes. 8 points are allotted for turning the portfolio in on time. 60 points possible

8. 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, Montessori's writings, and/or NCTM guidelines. 10 points possible

9. 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

10. Students will create a math material and present it to the class. ***Presentation*** must include a three period lesson. Evaluation will be as follows: 1 point for creativity, 1 point for aesthetics, 1 point for developmental appropriateness of material, 1 point for developmental appropriateness of presentation, 2 points for presentation itself, 1 point for stage presence, and 3 points for correctness and completeness of three period lesson. Students will also participate in evaluation. 10 points possible

11. The ***performance final*** consists of presenting to the instructor an activity that the student selects by pulling its name from a hat. Assessment includes 1 point for choosing the correct materials, 1 point for setup, 2 points for procedures, 2 points for presentation, 1 point for correct language, and 3 points for a three period lesson. 10 points possible

12. The ***written final*** reflects objectives and outcomes listed for this course and consists of answering questions that assess the knowledge you have gained. 10 points possible

COURSE OUTLINE AND **CONTENT**

Jan 18	Introductions Getting to know you Syllabus/Orientation to course History of math Video
Assignment: due 1/25	Read: Chapters 1,2, Write: Chapter Reflection #1
tan 25	**PRENUMBER** EXPERIENCE Three Period Lesson Geometry Fractions Measurement Graphing Sorting/Categorizing Time and Money
Assignments due 2/1	Read: Chapters 3 and 6 Write: Chapter Reflection #2 Prepare: Portfolio section on Prenumber Experiences
Feb 1	**NUMERATION** TO TEN/**NUMBER** SENSE Number Rods Sandpaper Numerals Rods with numerals Spindle Boxes Odd and Even Game Mystery Game Bead Stair with numerals Search for Ten
Assignments: due 2/8	Read: Chapter 9 Write: Chapter Reflection #2 Prepare: Portfolio Section on Number Concept/Number Sense
Feb 8	INTRODUCTION TO PLACE VALUE Introduction to base ten - quantity and symbols Crisis of Nine Quantity Layout and games Symbols Layout and games Quantity and Symbols - games
Assignments: due 2/15	Read: Chapters 5 and 22 Write: Chapter Reflection #3 Prepare: Portfolio Section for Place Value
Feb 15 **FIRST** LOG **DUE**	**LINEAR COUNTING** Teen Boards - quantity, symbol, combined Ten Boards - quantity and symbol/tens only'

Ten Boards - quantity & symbols/ 10-99
Hundred Board
Chains - 100 and 1000

Assignments:
Read: Chapter 7 sections on addition and multiplication
due 2f22
Write: Chapter Reflection #4
Prepare: Portfolio Section on Linear Counting

Feb 22
OPERATIONS ON WHOLE NUMBERS/Base Ten Blocks/Golden Beads
Addition - with & without regrouping
Multiplication - "
Definitions & properties of operations + & x
Algorithms for + & x

Assignments:
due 2/29
Read: Chapter 7 sections on subtraction and division
Write: Chapter Reflection #5
Prepare: Portfolio Section for Operations + and x

Feb 29
OPERATIONS ON WHOLE NUMBERS/Base Ten Blocks/Golden Beads
Subtraction - with & without regrouping
Division - "
Definitions & properties of operations - & -
Algorithms for - & -

Assignments:
due 3/7
Read: Chapters 10 and 11
Write: Chapter Reflection #6
Prepare: Portfolio Section on Operations - and -

Mar 7
OPERATIONS ON WHOLE NUMBERS with Stamp Game
Addition - with & without regrouping
SECOND *LOG* DUE
Multiplication - "
Subtraction - with & without regrouping
Division - "

Assignments:
due 3/14
Read: Chapters 8 and 24
Write: Chapter Reflection #7
Prepare: Portfolio entries for stamp game

Mar 14
MATH FACTS - MEMORIZATION
Strip Boards for addition & subtraction
Bead Boards for multiplication & division
Finger Charts for all operations

Assignments:
due 3/20
Read: Chapters 4 and 23
Write: Chapter Reflection
Prepare: Portfolio Section for Memorization

Mar 20
PROCESS PROBLEM *SOLVING*

Assignments:
due 4/4
Read: Chapter 16
Write: Reflection #9
Prepare: Portfolio Section on Problem Solving

Mar 28
SPRING BREAK

Apr 4	APPLICATIONS OF MATH Measurement - Standard and Metric Graphing
Assignments: due 4/ 11	Read: Chapter 17 Write: Chapter Reflection #10 Prepare: Portfolio section on Measurement
Apr l l THIRD LOG DUE	GEOMETRY
Assignments: due 4/18	Read: Chapter 12 and Chapter 14 pages 274-283 Write: Chapter Reflection #l l Prepare: Portfolio section on geometry
Apr 18	FRACTIONS AND DECIMAL FRACTIONS/conceptual development
Assignments: due 4125	Read: Chapter 13 Write: Chapter Reflection #12 Prepare: Portfolio section on fractions and decimal fractions
Apr 25	FRACTION OPERATIONS AND MONEY
Assignments: due 5 /2	Write: Lesson Plan for presentation Prepare: Portfolio section for fraction operations and money Prepare: Materials for presentation For the presentation itself
May 2	STUDENT PRESENTATIONS
Assignments:	Prepare: Complete Portfolio For performance test For Written final
May 9 PORTFOLIO DUE	PERFORMANCE TEST WRITTEN FINAL

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

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 timeframe of the course, to achieve this outcome.

` NAME DATE

ETHNICITY AGE

Number of EDUCATION courses previously taken This semester?

1-Specify some of the current research on how children learn math.

2-State three NCTM guidelines for K-3 and discuss implications for practice.

3-Delineate the sequence in which math concepts as presented in this course and name at least one material/manipulative that can be help children learn each.

4-How would you design and create developmentally appropriate math activities for children Pre-K to grade 3?

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

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

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

8-What types of alternative assessment are appropriate for "doing math" with manipulatives?

9-Discuss what you know about how you learn and think about math.

10-Discuss your O&P experiences in terms of NCTM guidelines and constructivist learning theory.