Math 353: Methods and Materials in the Teaching of Elementary School Mathematics
Winter Semester, 2003

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Brief Description of the Course:

This is a course designed to acquaint prospective elementary teachers with contemporary methods and materials employed in the teaching of mathematics in the elementary school. We do this by exploring methodologies for teaching a variety of topics. Topics and methodologies are consistent with those of the *Michigan Curriculum Frameworks* and the National Council of Teachers of Mathematics' *Principles and Standards for Teaching Mathematics*.

A few minutes reflection will make it obvious that this course cannot teach you how to teach each and every topic in the K-8 math curriculum. The goal is to help you develop the ability to use various curricular materials to plan lessons that you will teach using methods you deem appropriate. Naturally, I have views on ways to teach. These views are based on the documents listed above. The course will rely on such methods.

Prerequisite: Admission to the methods phase of teacher education; MA 150 and MA 151.

Text: Van de Walle (2001). *Elementary and Middle School Mathematics*, 4th Edition. Longman

General Requirements:

- Professional behavior and attitude at all times:
  - Ask questions rather than pass judgments
  - Have a spirit of cooperation and support with your peers, cooperating teacher, and me
  - Show a genuine interest in learning the subject matter
  - Demonstrate a sincere interest in the needs of elementary students
  - Make every effort to be a valuable member of both our class and that of your cooperating teacher
  - Use clear, grammatically, and mathematically correct language
  - Respect others' privacy
  - Reflect excitement about teaching and learning
  - With the advent of wireless computing, some students have started abusing the use of laptops in classes by emailing, surfing the web, etc. This will not be tolerated. Each such action will result in loss of a grade in participation points.
- For most of the semester, Thursday class sessions will meet at Sandy Knoll (SK) School. (SK's spring break is the week of April 14th. Thus, on Thursday, April 17, we will meet on-campus.) At SK, you will check in with me & then go to your assigned classroom. There, you will be expected to participate in the manner the teacher specifies. This may mean observing and taking notes, helping a specified child or group, helping whoever needs help, etc. This will be negotiated between yourself and the teacher and may change from week-to-week. *If you have concerns about your role in the classroom at any time during the semester, see me immediately.*

- Professional attire in SK school. At minimum, this means no shorts or blue jeans, Also, you will wear a badge (that I will supply) identifying you & your affiliation at all times in SK (if not, you will lose participation points).
- On Mondays we will: explore some mathematics in a way consistent with the *MI Frameworks* & the NCTM *Standards*; discuss readings from the text; watch videos; discuss our experiences at Sandy Knoll; and engage in other appropriate activities.
- Attendance at all class sessions.
- Participation will be an important part of your grade. This means that you must be on time and prepared (read assignments, prepared materials, completed journal entries, etc.) for all class sessions. There will be times when we work individually, in small groups, or as a whole class. You will be expected to participate in all types of work to help develop all of our understanding of teaching mathematics in the elementary school.

Assessment (details will be provided in class as necessary)**:**

- Attendance and participation. (50 pts)
- A journal of your elementary classroom experience across the semester. The first journal entry will have specific questions to which you will respond. Journals will be collected **without notice** once or twice during the semester. (50 pts)
- Teaching of at least one lesson observed by your cooperating teacher and myself. At least 2 weeks prior to teaching, you will submit a lesson plan for which I will give you feedback. Grading will be on the plan (revised as necessary depending on feedback) not the actual teaching. (50 pts)
- Production of a "trade book" that you will write and illustrate. (50 pts)
- You will be assigned readings from the text, preparation of materials, and various other out-of-class work. For most of these, you will be required to write up some kind of analysis or reaction. (10 pts ea--100 pts total)

All written assignments are to be typed and submitted in hard copy form.

[Note: You may design any assignment to double-count with another course in the block—but it is *your* responsibility to make sure it meets the criteria of the instructors of both courses.]

Feel free to contact me (in my office, via e-mail, before/after class, etc.) when you feel you need help. I have resources that I am willing to share. Do **NOT** wait till the last minute (e. g., the day before you will teach or a major assignment like the trade book is due) to seek help! Contact me if you do not understand the way I am grading assignments or if you are concerned about the grades you are receiving. If something becomes an issue, contact me immediately—do not wait till the last week of the semester.

Grades will follow the following scale:

A	93-100 percent	A-	90-92 percent		
B+	88-89 percent	B	83-87 percent	B-	80-82 percent
C+	77-79 percent	C	70-76 percent	C-	67-69 percent
D	60-66 percent	E	below 60 percent		

If you have a need for disability-related accommodations or services, please inform the Coordinator of Disability Services in the Disability Services Office at 1104 University Center (227-1737). Reasonable and effective accommodations and services will be provided to students if requests are made in a timely manner, with appropriate documentation, in accordance with federal, state, and University guidelines.

MA 353 Journal Assignment

You will write a journal entry after each class period at SK. My expectation is that these will be completed before the next on-campus class (Mondays). Below, I spell out minimum expectations for the first and subsequent entries. These are to be typed and observation dates included for each entry. You need not keep them in any fancy binder but, if you turn in loose pages, at least paper clip them together & make sure your name is on each sheet.

The purpose of these journals is NOT to provide a record of attendance or be a diary. The goal is for you to use them as a place to think—and hence, learn—about teaching. When I grade them, I will be looking for evidence that you are doing so.

First Day Observation Guide

1. Document the atmosphere in the classroom the moment you arrived. Did the students seem happy? Tense? Comfortable? Other? There may not be <u>one</u> atmosphere that you feel prevails over the whole room. The atmosphere may change across the time you are there. Try to note all this. Provide evidence for your observations—give examples of behaviors that made you think this.
2. Briefly describe the room and note evidence of mathematical activities. Note arrangement of student tables/desks. What is on the walls, chalkboard, etc? What posters, if any, are up? Etc.
3. What is your impression of the students' attitudes about math? Not all students may fit any particular category—try to get a sense of where *all* the students are attitudinally. Provide evidence for your observations.
4. Write about today's math lesson itself. What did the teacher do? What did the students do? {These should be more than "teach" & "learn." Did the teacher do examples? Did she give the students a "big" problem to work on in groups? Did she do all the talking? Did students talk—about math—with their peers or did they only answer the teacher's questions? Were their answers limited to one word or number or did they describe *how* they solved problems? Etc.) Think in terms of the NCTM Process Standards& our class discussions of them.
5. What was the mathematical content? Be more specific than, say, "Geometry" or even, "triangles." What math could the students learn? Think in terms of the NCTM Content Standards & our class discussions of them.
6. What did this experience start/continue you thinking about teaching?

Later Observation

At minimum, these should address questions 4, 5, & 6 above.

MA 353 Lesson Plan Assignment

I encourage you to start talking with your cooperating teacher (CT) early on in the semester about your plans to teach.

First draft of Lesson Plans is **Due at least 2 weeks before date of teaching!**

The draft will not be graded (but must include ALL of the items listed below or points will be deducted from the revised version). I will provide a response (comments, suggestions, etc.) the next week. You are expected to act upon these, to revise your plan accordingly or discuss with me (try to convince me) why you should not follow my suggestions!

The revised LP, the one to be graded, is **Due the morning you teach—give it to me BEFORE you teach.**

You may use any format but it must include (& I must be able to identify) the following (order is not important):

- What the teacher will do

  What will the teacher say? What will the teacher ask? Don't say things like, "The teacher will explain the concept." This is completely generic & does not tell me what you are thinking. Don't say, I will ask the students if they understand." Think about yourself as a student when teachers ask this question; few students willingly admit they do not—esp. when the rest of the class answers yes.

  If you are team teaching, indicate which of you will be leading for each part (or, if you will co-lead, how you will do this) & what the other does at the same time.

  If you are doing centers, indicate who will be at each station. Indicate how often & how you will know when to rotate stations.
- What the students will do

  What will be the classroom arrangement?

  Will they be in their desks, at the board, writing, drawing, etc?

  If the lesson has multiple parts, you should provide this fir each
- What are your mathematical goals?

  This should be about learning goals—what will the students (hopefully) understand after the lesson that they d not before. Learning goals are not about what the students will do. I.e., not "They will solve problems.", not "They will measure shapes.", etc.
- What is the mathematics available from the activity?

  What areas of math does the lesson address?—recall our in-class conversations about math in (a) our in-class activities & (b) various lessons the class has been observing. This should be much more specific than, say, "Geometry." or "Measurement." or "Area & perimeter."
- How will you assess the students?

  Make sure you include information on how you will assess students. This does NOT need to be a worksheet but you must be clear about how you will tell if students are meeting your learning goals. [Completing a worksheet in & of itself is not such an indicator. I am sure many of you have done worksheets without having understood the concepts—I know I have.]
- If you will use any worksheets, include them with both your draft and revised versions.

- Approximate time for <u>each part</u> of the lesson. How long will the intro take? Dividing up the students (if necessary)? Passing out materials? Etc.
- What materials do you need to have or prepare before the lesson?
- Feel free to utilize the Selection & Evaluation criteria & the problem solving goals we discussed in class.
- Any other info you deem important & necessary.

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MA 353 Trade Book Assignment

Trade books are books that children may read in or out of school. They are not aimed solely at "students: but at "children" (which, of course, may include students). Make sure your book fits this description.
The book may be fiction or non-fiction.
It must be in book form: cover, title, table of contents, page numbers, etc.
There are to be at least 12 activities related to geometry, measurement, or a combination of both. These activities may be simple but should be part of a story. That is, do not make your book a series of things like: "What is the area of this square?" This is not a story!
In an introduction for parents &/or teachers, indicate the age for which you think the book is appropriate. (You may also include other info in the introduction.) Of course, the activities should then be appropriate for the level stated.
At the back of the book, provide a list of solutions.
Illustrate the book. Illustrations may be freehand drawings, pictures, clip art, etc.

Grading will be based on:

- Accuracy of the mathematics
- Connecting math with literature
- Grammar & spelling (yes, I expect correct grammar & spelling.)
- Book & story form
- Creativity
- At least 12 activities