TE 401
Teaching Subject Matters to Diverse Learners: Mathematics Component
Section 11: Tuesday, 12:40 - 3:30 Erickson 128

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Textbook Web site: http://wps.ablongman.com/ab_vandewalle_math_5
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Welcome to TE 401. This course is designed to build on your learning experiences in MTH 201 and MTH 202. Although you will continue to develop your understanding of important mathematical ideas, this course shifts our focus to consider what it means to teach these ideas to children in the elementary and middle grades. To that end, we pursue mathematical ideas from the perspectives of *you as a teacher* and *children as learners* of those ideas.

At this point in your professional studies, you are ready to develop images of the kinds of classrooms that support **all** children in **making sense of mathematics**. This entails learning how to create problem-solving, inquiry-based environments that promote children's engagement with mathematical ideas and with the doing of mathematics. Our collective work aims to help you interrogate your own knowledge, values, and beliefs about teaching and learning mathematics so as to begin to develop a curricular and pedagogical vision and a set of practices to shape the mathematical experiences of the children you will teach.

Course Goals

Mathematical domains and pedagogy. In TE 401, we concentrate on two content strands in the school curriculum: number and operations; algebraic reasoning. The first strand, the arithmetic of number, has been the traditional staple of the elementary mathematics curriculum. In typical classrooms, children spend much of their time mastering basic facts and algorithmic procedures for computing with numbers. In our course we explore ways to help students develop a *rich and connected understanding of number and number-related concepts and procedures.* This takes us from the development of early number concepts to the meaning of operations, to the role of number and operation concepts in the mastery of basic facts, to an understanding of place value concepts and procedures and their extension from whole numbers to decimals and percents.

The second strand, algebraic reasoning, is relatively new to the elementary mathematics curriculum. It involves recognizing, extending, and generalizing patterns with words and symbols. In fact, much of the arithmetic of number can be generalized and formalized with words and symbols (e.g., an odd number is always one more than an even number and can be expressed in the form 2n + 1 where n is any whole number). Algebraic reasoning also involves functional relationships – how the change in one variable affects another – and ways of representing functional relationships – real world contexts, tables, graphs, equations, words. In our course we explore ways to help young students develop the *concepts and tools for investigating and expressing regularities* in mathematics.

In addition, we explore ways to uncover and elicit children's thinking and sense making about number, number sense, operations and algebraic reasoning and why this is important in developing your own practice.

Curriculum inquiry. We undertake a critical examination of traditional and reform curriculum materials to see (a) how ideas in a strand develop across the grades, (b) what guidance they provide to teachers about how to read and make use of them, (c) to what extent they can help novice teachers to support inquiry-oriented teaching, and (d) what teachers might learn themselves about mathematics through their use.

Planning for teaching. And we tackle what is entailed in planning for teaching – both its intellectual demands and its practical dimensions.

Classroom management. Many of the challenges novice teachers face in managing a mathematics class are entwined with choices they make about learning activities and ways to organize students to productively engage in those activities. At the same time there are some clear, practical, research-based ideas for creating productive classrooms where students ideas are encouraged and respected. We explore some of the principles of good classroom management in the context of creating inquiry-based mathematics classrooms in which all students can be successful.

These are ambitious goals for the short time we will spend together this semester. Therefore they require your full participation and commitment. This course is not just another hurdle to get over on your way to graduation. Rather it is the next stage in your learning to be a mathematics teacher, and there is much to learn to develop the knowledge, skills and dispositions that can make you an effective teacher. In the internship year we take up other content strands (geometry and data analysis) and we spend considerable time on assessing student learning and connecting assessment with curriculum, teaching and learning.

Contexts for Learning

Our mathematical, curricular, and pedagogical explorations will take place in four main contexts:

- our on-campus seminars;
- a virtual Grade 3 mathematics classroom hosted in the hypermedia lab in room 128 Erickson Hall;
- your field placement;
- your self-directed study.

In our on-campus seminars we do some mathematics together, discuss assigned readings, analyze students' mathematical work, critically examine teaching events portrayed in videotapes and vignettes, and more. In the first weeks of class you conduct a classroom culture study in a virtual grade 3 classroom. At your assigned school you observe mathematics teaching in action and investigate students' mathematical reasoning and sense-making. You have the opportunity to observe and work closely with students, design and try out mathematical tasks with students, collect samples of their work, and engage in interactive teaching sessions. The self-directed study is described below.

Textbooks and Other Readings

Three textbooks are required for this course and will be used again in your internship courses. You should consider them part of your growing professional library that can support you into your first year of teaching and beyond. These texts are available at the MSU bookstore. The ISBN number for each text is given should you want to purchase them from some other source.

Van de Walle, J. (2004). *Elementary and middle school mathematics: Teaching developmentally.* (Fifth Edition). Boston, MA: Allyn and Bacon. ISBN: 0-205-41685-3
NOTE: Be sure you purchase the Fifth Edition.

Weinstein, C., and Mignano, A. (2003). *Elementary classroom management: Lessons from research and practice*. New York, NY: McGraw-Hill. ISBN: 0-07-232243-8

In addition, we use three standards documents that are accessible on the web.

Principles and Standards for School Mathematics (2000) and *Professional Standards for Teaching Mathematics* (1991) are published by the National Council of Teachers of Mathematics. See the NCTM website at www.nctm.org and click on NCTM Standards to find the full text of these two documents. You will also find a number of applets – interactive tools for learning about mathematical concepts.

We also use the *Michigan Curriculum Framework for Mathematics*. See the Michigan Standards and Benchmarks at www.cdp.mde.state.mi.us/mcf/

Finally, there are several additional short articles that will be posted on our class website.

Reading Assignments and Due Dates

Readings	To be completed by
Vacc, Schwartz and Lester articles (posted on class website); Chapters 1 & 2, Weinstein	Aug. 28 (week 1, 2 days after first class)
Van de Walle: Chapters 2, 4, and Appendix B NCTM *Professional Standards for Teaching Mathematics* Weinstein: Chapter 8	Sept. 2 (week 2)
Van de Walle: Chapter 22 and Appendix A - Algebra Standard Weinstein: Chapters 3	Sept. 9 (week 3)
Van de Walle: Chapter 23 *PSSM*: Algebra Standard (on the web, pp. 37-40; 90-95;158-163; 222-231)	Sept. 16 (week 4)
Van de Walle: Chapter 9 and Appendix A – Number and Operations Standard	Sept. 30 (week 6)
Van de Walle: Chapter 10 *PSSM*: Number and Operations Standard; K-2 Number and Operations Standard (on the web, pp 32-36, 78-79)	Oct. 7 (week 7)
Van de Walle: Chapter 11 *PSSM*: Principles, pp. 11-27 (on the web)	Oct. 21 (week 9)
Van de Walle: Chapter 12	Nov. 4 (week 11)
Van de Walle: Chapter 13	Nov. 11 (week 12)
Van de Walle: Chapter 17	Nov. 18 (week 13)
Van de Walle: Chapter 7 Weinstein: Chapter 5	Nov. 25 (week 14)

Written Assignments, Due Dates, and Grading

A brief description of each written assignment is below. More details on the assignments will be provided as their dates approach.

Reading Prompts. Each week you are given a prompt to guide your reading of and reflection on the chapter(s) assigned for that week as well as our discussion of them in class. You are required to read all assigned readings but respond in writing to the prompts. You must submit a response to me electronically *before class on the day that it is due*.

Project One: Classroom Culture Study is an investigation into an element of classroom culture and the role it plays in your field classroom and a virtual Grade 3 classroom. Further details will be provided during class, but here is a brief description of the paper you submit. In your paper you (a) identify an element of classroom culture, how you think about it, and why you want to explore it; (b) use your observation notes to construct two vignettes (one for each classroom) which contain key examples and details about the role of your element in those classrooms; (c)

provide your interpretation of what is happening in the classrooms with respect to your element; and (d) reflect on new insights, questions, ideas, worries, you have about establishing a culture for learning mathematics in your classroom?

Project Two: *Addworm*
Addworm is a patterns task designed by the Mathematics Assessment Resource Service at MSU. We work on the task in class to explore the mathematics and to imagine what fourth grade children might do with and learn from the task. We also examine several variants on the task, designed for other grades. You and your teaching partner(s) plan a lesson in which you have a small group of children work the grade appropriate version of *Addworm* while you observe. Then you engage the children in a discussion about how they reasoned about the problem situation. You write up a reflection on your experience of using the task with children. Your paper includes an analysis of two samples of interesting student work, and what you learned about students' efforts at reasoning and sense-making.

Project Three: Planning and Teaching Two Lessons. Over a period of several weeks in the second half of the course, you plan, teach, and reflect on the teaching of two grade appropriate inquiry-based lessons that build on each other related to number and operations. You and your mentor teacher decide on the particular content. You and your teaching partner(s) collaboratively plan and teach the lessons to the entire class. For this assignment, you submit (1) your lesson plans with stated goals and details on the important ideas of the lesson, (2) a summary of your analysis of your students' understanding of the lessons you taught (with evidence to support your claims), and (3) your reflections on what you might revise in your lessons and what you might do next as a follow up. You submit one set of plans for (1) but individual responses to (2) and (3).

Project Four: Self-directed Study of Fractions. The MSU Teacher Preparation Program cannot fully prepare you to teach every content area of the elementary mathematics curriculum. But we can provide an opportunity for you to direct your own learning of a topic that we do not cover. Over the semester you undertake a self-directed study to learn about teaching fractions. The aim is for you to learn to find and use resources to further your independent learning about an important part of the curriculum, to better understand the challenges teachers have in teaching fractions and children have in learning fractions, and to develop images of what teaching fractions might look and sound like in a classroom where making-sense of mathematics is actively pursued.

Your **Learning Log** is a 3-ring notebook for collecting mathematical insights that you've experienced during seminars, field visits, work with students, readings, and self-directed study. I occasionally assign a prompt for your reflection but for the most part this is a place for you to work out and extend your own understanding of particular concepts, teaching strategies, classroom management ideas, etc. I do not expect that you will have every new idea figured out so your Learning Log is also a place to record questions that you're still unclear and unsure about. Bring your Learning Log to each seminar. It is the place where you work on mathematics, take notes on our discussions, and add ideas to your professional toolkit.

Written Assignments	**Due Date**	**Points**
Three Coin problem	Sept. 2 (week 2)	5 points
Project One: Classroom Culture Study Part 1: Vignette from Ball classroom	Sept. 9 (week 3)	
Part 2: Vignette from field	Sept. 23 (week 5)	
Part 3: Analysis of vignettes, reflection related to one element of classroom culture	Sept. 23 (week 5)	10 points
Project Two: *Addworm* Part 1: Group-developed Lesson Plan for using task	Sept. 30 (week 6)	

with a small group of children Part 2: Individual Reflection on planning and teaching	Oct. 14 (week 8)	20 points
Project Three: Planning and Teaching two grade appropriate lessons related to number and operations Part 1: Group-developed Lesson Plan for teaching to whole class Part 2: Individual Reflection on planning and teaching	Oct. 28 (week 10) Dec. 2 (week 15)	20 points
Project Four: Self-directed Study of Fractions Part 1: Do *Fractions of a Square*, analyze using Van de Walle Activity Evaluation and Selection Guide Part 2: Find resources and record ideas about teaching and learning fractions in Learning Log Part 3: Try *Fractions of a Square* with a small group of 5th graders at your school Part 3: Mid-term – Group work to design a task with similar content for younger children; Assessment of notes in Learning Log Part 4: Read research article on teaching and learning fractions and write about new insights in Learning Log Part 5: Revisit *Fractions of a Square* in light of new learning about teaching fractions. Reassess using Van de Walle Activity Evaluation and Selection Guide	In class – Aug. 26 (week 1) Weeks 2-7 Sept. 23 (week 5) In class – Oct. 14 (week 8) Weeks 9-11 Nov. 11 (week 12)	20 points
Responding to Reading Prompts At least four -- selected by the instructor -- will be assessed on a pass/fail basis. Only those that pass will count toward minimums required for final grade. (Ungraded prompts will count as passing.)	All Readings and responses to prompts are due before class the day for which they are assigned	See grading below
Professional Conduct: Attendance, Participation, Timeliness in Seminars and Field		10 points
Final Exam		15 points

Assignment Policies

Late Assignments: Conflicts with an assignment deadline should be discussed and must be resolved before its due date. Since this class is part of your professional development, you are expected that to turn in assignments on the assigned dates. If you choose to plan your time so that an assignment is late, I reserve the right to choose to not accept it or to deduct points for that assignment. If you are absent on the day an assignment is due, it will be considered late.

Professional Writing: TE 401 is a University tier-two writing course. We hold high expectations for seniors as you begin teaching children and move closer to the internship and a professional teaching career. Learning Log writing, in-class writing, observations and notes from classrooms can be informal, handwritten, with a major focus on ideas, and less attention to writing mechanics. Formal assignments should be word-processed and free of grammatical, spelling and punctuation errors. Only work that is handed in on time, free of spelling mistakes, and is of outstanding quality will be awarded a 4.0.

Class Participation and Attendance
Your thoughtful participation is essential to the success of the class and to your learning. The more effort you are put into reading, writing, thinking, and discussing, the more we can all learn from one another, and the more valuable it will be for you individually. For each class meeting, you should complete any reading or writing assignments and be prepared to offer your thoughts about these in class. As a developing teacher, it is important that you learn to share your ideas and thoughts with others--including your students and your colleagues. A commitment to learning to teach and to being a supportive colleague includes being on time, being respectful and responsible in responding to other people's talk and behavior, being cooperative in helping the group function well as a learning community, being open to new ideas and reserving judgment about others' reasons and actions, and being willing to engage in lively and knowledgeable discussions about ideas and actions.

This class is a professional methods class. Dependability and punctuality are critical qualities in the profession of teaching and your regular attendance and punctuality are important to your participation in this class. There is no category for “excused” or “unexcused” absences. Excessive absences or tardiness will result in a meeting with the Team Three coordinators to assess your further progress in the program. Missing two or more classes is considered excessive and will result in a lower grade by as much as half a point on the four point scale for each such absence. If you are sick or have an emergency that requires you to miss seminar or be late arriving, you are expected to call (or e-mail) the night before, explain the problem, and make arrangements for another student to take notes for you. You are responsible for catching up on any missed material. Similarly, if you must be absent from your field placement, you are expected to call your mentor teacher and your teaching partner (if you have one) the night before and make arrangements to make up the missed work with your partner and/or mentor teacher. All missed field time must be made up.

If you are scheduled to be in the field and the schools have a snow day you also have a snow day. We do not meet on campus in order to fill the time and you do not have to make up the missed time. You should listen to the radio or TV for school closings.

Communication and Professional Responsibilities
In the schools, Team Three and school staff expect you to dress, act, and talk in professional ways. (Short skirts, baggy pants, hats and casual clothes are not appropriate.) You are expected to be respectful of children and school staff and mindful of their need for teaching and learning to go on without unnecessary interruption. This means that loud talk in hallways and classrooms is not appropriate. The confidentiality of the children and their families should be maintained at all times.

Intellectual Honesty: Work that is not your own needs to be properly cited, whether the source is a classmate, a Web site, or a published text. Taking credit for work you did not produce is considered plagiarism, which is a serious offense with serious consequences. Work that is intellectually dishonest also includes writing a response to a text you did not read or writing up a report of a lesson you did not plan or carry out. Work that is found to be intellectually dishonest will receive a failing grade and may constitute grounds for failing the course (see your student handbook and MSU policies for students’ rights and responsibilities)

The MSU policy reads in part: "Integrity of Scholarship and Grades - The principles of truth and honesty are recognized as fundamental to a community of teachers and scholars. The University expects that both faculty and students will honor these principles and in so doing protect the validity of University grades. This means that all academic work will be done by the students to whom it is assigned, without unauthorized aid of any kind. Instructors, for their part, will exercise care in the planning and supervision of academic work, so that honest effort will be positively encouraged."

Technology Requirement

The State of Michigan has several technology requirement that must be met befor you are allowed to begin the internship (see the Student Handbook for more detail). In our seminar you complete the "Spreadsheet and Data Base" requirement at level 1 by keeping a log of your field experiences for each day in your field placement. The spreadsheet will include tracking your total hours, hours by subject and location (e.g., classroom, computer lab, library), and hours you spend actually teaching or working with individual students. A detailed description of the assignment will be available on our Web site before you begin your placement. This assignment is graded as pass/fail and does not contribute to your grade for this course. If you fail this assignment, you are required to fulfill this requirement on your own time to the satisfaction of the Team 3 program advisor before you are allowed to begin your internship.

Final Grade for TE 401

The final grade in the course is an average of the math and science grades. You must pass both components to pass the course. An incomplete or failing grade for either of the two components means an incomplete or failing grade for the course. Each of the two components is worth a total of 100 points. The final grade will be figured as a percentage of the total number of points possible (200) and grades will be assigned as follows:

4.0 94-100% plus completion of 10-11 reading prompts
3.5 88-93% plus completion of 9 reading prompts
3.0 82-87% plus completion of 7-8 reading prompts
2.5 76-81% plus completion of 5-6 reading prompts
2.0 70-75% plus completion of 4 reading prompts

Expectations for each grade are provided in the table below. Keep in mind, that these expectations apply to assignments across the semester, so not every criterion will be applicable to every assignment.

Percentage	Four point scale	Description
94 -100%	4.0	Outstanding, exemplary work. Uses and integrates readings, classroom discussions, and field experiences (where appropriate) to inform the writing. Meets all the requirements of the assignment, is deeply thoughtful, and provides many details and examples to support the arguments made. Work has minimal errors in grammar, punctuation, spelling. Misses no classes during the semester. Satisfactorily completes at least 10 of the reading prompts.
88-93%	3.5	High quality work. Uses many readings, classroom discussions, and field experiences (where appropriate) to inform the writing. Meets all the requirements of the assignment, is thoughtful and provides some details and examples to support writing. Very few errors in grammar, punctuation, spelling. Misses no more than one class during the semester and makes up all work that is missed. Satisfactorily completes at least 9 of the reading prompts.
82-87%	3.0	Good quality work, performing at expected level for senior year. Uses some readings, classroom discussions, and field experiences to inform writing. Meets all requirements of assignment, shows attempt to engage with purposes of assignment, provides details and examples to support writing. Few errors in grammar, spelling, punctuation. Misses no more than two classes during the semester and makes up all work that is missed. Satisfactorily completes at least 7 of the reading prompts.
76-81%	2.5	Work below expected level of quality for the TE program. Does not include appropriate references to relevant readings, class discussions, and field experiences to inform writing. Does not meet all requirements of assignment. Limited attempt to engage with purposes of assignment, few details and examples to support writing. Many errors in grammar, spelling and punctuation. Satisfactorily completes at least 5 of the reading prompts.
70-75%	2.0	Significantly below expected level of quality. Many errors in grammar, spelling and punctuation. Shows little evidence of having read course readings, of uses of classroom discussions or of field experiences. Meets few of the assignment's requirements. Shallow attempt to engage with purposes of assignment, no details or examples to support writing. Satisfactorily completes at least 4 of the reading prompts.