ED 406: Children as Sense-Makers #2  
Winter 2014

<table>
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<tr>
<th>Instructor</th>
<th>Meghan Shaughnessy</th>
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<td>Office</td>
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<td>Office hours</td>
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<tr>
<td>CTools Site</td>
<td>CaSM Cohort 1 Winter 14</td>
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**Class meetings:**  Wednesday 8:40 a.m. - 11:30 a.m.

**Location:**  4212 SEB unless otherwise announced

**Course Overview**

This course builds on the fall Children as Sense-makers course in which you learned to elicit students’ sense-making about an everyday phenomenon (the day/night cycle); interpret/characterize students’ sense-making in terms of its accuracy, consistency/coherence, completeness; facilitate student sense-making using text and physical modeling; and assess student sense-making for change. In this course, you will apply and extend this work on eliciting, interpreting, and assessing student sense-making to a new content area (mathematics) with upper elementary students.

Finding out what students know, how they work on tasks, and what their dispositions are toward a subject is essential for responsible instruction. Teachers use a variety of assessment practices to improve their teaching, to document their students’ achievement, and to inform students, parents, and other educational stakeholders. Assessment encompasses much more than grading and testing. It includes interacting with students as they are learning, pausing to document what students are saying, and noticing patterns in students’ work.

During this course, you will have opportunities to develop your knowledge and skills with interpreting student thinking in both oral and written forms, to use oral and written tasks to elicit and probe student thinking, and to use the evidence from assessments to design and enact targeted instruction with an individual student.

Another goal of this course is to help you develop skill in explaining mathematical content in ways that support student learning. Mathematical ideas and processes can be represented in many ways. Having a wide repertoire of mathematical representations and knowing how to establish the equivalence of different representations are important not only in doing mathematics but also in teaching it. For example, with a given task or explanation, one representation of the mathematics may be better suited than another to solve the problem or to make an explanation clear. By the end of this course, you should be able to use resources to represent and explain core fractions content. You also should have developed more general skills for representing and explaining mathematical ideas in domains beyond those in this course.

**Learning goals**

During this course, you will further develop your capability to:

- Work with individual students to elicit, probe, and develop their thinking about mathematics content;
- Explain core content related to fractions;
- Use specific methods to assess students’ learning in mathematics;
- Recognize and identify common patterns of student thinking about fraction concepts;
- Identify and implement an instructional strategy using a model to develop understanding in response to common patterns of student thinking; and
- Choose, appraise, and modify tasks for a specific learning goal.
How we will work together

As in other courses in the elementary teacher education program, our work will be “practice-based” in four senses of the phrase. First, you will be participating in a common practice, our class activities, discussions, and interactions offer us opportunities to study practice from the inside. You can learn by paying attention to and analyzing our interactions together. Second, we will study records of practice to learn the work of teaching. These records — videotapes of lessons, students’ work, and teacher’s plans, materials, and reflections — make it possible for us to study classroom mathematics, the work of teaching, and students. Third, we will practice together and critique the use of specific teaching techniques to improve enactment and deepen understanding. Fourth, the major assignments and assessments will involve carrying out specific instructional practices. My expectations for your performance are that you demonstrate the skill and knowledge levels appropriate to be developing into a skillful beginning teacher who can take responsibility for children’s mathematics learning.

Materials

For this course, you will need to have:

- a video recorder and tripod
- a three-ring binder
- a set of fine-tipped markers

You will be reading a variety of articles and other materials (e.g., curriculum materials). All required readings will be provided on CTools, as hard copies, or through a website. The following texts are suggested resources for teaching elementary and middle school mathematics. We will draw upon these resources in the course and you may wish to consider purchasing them to support your work in student teaching and beyond.


Course Policies

Attendance

Attendance is an expectation in this class as a form of professionalism. I expect you to attend every class, to arrive on time for a prompt start, and to stay till the end. It is vital that you attend every class session if at all possible. If you cannot be present for a class session, let me know by e-mail by 8:00 a.m. the day of class. Acceptable absences include absences due to religious holidays; please let me know at the start of the semester if you will miss class for this reason. While it will not be possible to recreate a missed class, please make arrangements with me to complete alternative work that will support the learning you missed. I will specify the due date for this alternative assignment. More than two absences from the class will make successful learning of the material in the course challenging and put you in danger of not being able to complete the course successfully. The Office of Teacher Education will be notified if there is more than one absence. Three absences—excused or unexcused—is grounds for failing this course.
**Class Participation**

Your participation in our class activities and discussions is important not only for your own learning but also for the learning of others. Sharing your ideas and questions with the group, as well as responding to those of your classmates, are fundamental to our work together. As a teacher, you need to do more than understand your own thinking -- you have to be able to track on others' thinking, figure out what others are saying, and determine whether and how they make sense. In our class, the "others" will be your classmates. In your field placement and in your own classroom in the future, the "others" will be your students, and sometimes your colleagues. Therefore, listening to and interacting with others in our class is important to help you develop this set of instructional skills. Talking in class is also an explicit goal of this course, not simply a means. As a teacher, you will have to “talk mathematics” all the time. This course provides opportunities to learn to talk mathematics more carefully and precisely, while at the same time considering your “audience” and gearing what you say to what they are likely to understand.

Appropriate use of electronic devices is also a part of your professional participation in our class. Using a laptop as a tool for your learning is acceptable, as long as it is not distracting to your colleagues. Examples of acceptable use of electronic devices include making records of your practice and consulting resources for work in class. Non-instructional texting, phone calls, social networking, shopping, and other non-instructional use of these devices are not acceptable in this class at any time. Please let me know if there is an emergency that affects your need for using a phone during class time.

Another aspect of professionalism is preparedness. I expect that you will thoughtfully prepare for all field-based work in this course. For our field-based assignments at Mitchell, being able to work with students is contingent upon submitting acceptable plans on time. Failure to do so will result in not being able to engage in the field-based work and you will receive a 0 for the assignment(s).

**Course Assignments**

You will have three types of assignments in this course.

1. **Weekly assignments**: You will have weekly assignments for most classes. Assignments will be distributed in class and should be completed by the specified due date. These will typically include mathematical problems that help you learn to use mathematics for teaching, tasks related to the core practices of teaching that you are developing this term, and reflections on what you read. Assignments will also be designed to provide additional practice with techniques and moves we have been exploring or to give you an opportunity to prepare for upcoming work in class. Weekly assignments will be turned in and graded. Some weekly assignments will receive letter grades and others will be graded as pass/fail. Your “weekly assignment grade for the course” will be an average of your grades on all of the assigned weekly assignments.

You will be reading a variety of articles and other materials for this class. Some of the readings will be discussed explicitly in class, some you will comment on in your weekly assignments, and others will simply be used in the context of our work. I expect you to be able to bring these readings to bear in assignments and discussions.

2. **Professional practice pieces**: These assignments are opportunities to try out and get feedback on the core practices of teaching that we are working on this term. These assignments will ask you to carry out specific tasks of teaching using the skills we have developed in class and then turn in a write-up or other record of your practice. I will provide detailed feedback aimed at helping you improve your practice. The point is to learn to do teaching. I will ask you to analyze your teaching so that you can develop skills to learn from and improve your practice. The due dates for these assignments will be indicated when the assignment is assigned. I will give you sufficient notice to arrange for and complete any assignments that need to be completed in your field placement.

3. **Final examination**: The course will conclude with a final examination designed to focus on your knowledge and skills for teaching mathematics. Consistent with the course goals of developing your proficiency as a beginning teacher of mathematics, this exam will ask you to demonstrate your performance in the main teaching practice domains of the course. You will be able to prepare in advance for the performances (written and oral) that the exam will ask of you. At least one week before the final examination, I will distribute a “study guide” listing possible exam problems and tasks. You will be able to prepare for each, working with others if you choose. You may make notes, gather ideas, and practice skills. The final exam will be “open book.”
Late/Missing Assignments
We expect that all assignments for this course will be turned in on time. If extenuating circumstances prevent you from turning in an assignment on time, please contact me via email prior to the submission deadline. Unexcused late work will be docked 10 percentage points per day. *Weekly assignments will not be accepted late.*

Academic Integrity
All work must be your own and done specifically for this course. Be sure to provide citations and attribution for any work of others included in your written work. University policy is very clear on the issue of plagiarism. For specific information about this issue please see: [http://www.lib.umich.edu/academic-integrity/preventing-cheating-and-plagiarism](http://www.lib.umich.edu/academic-integrity/preventing-cheating-and-plagiarism)

Grading Criteria
This is a professional course. The standards of performance are tied to your knowledge and enactment of principled practice as described in this document and to standards you will be expected to meet as a beginning teacher:
- meticulous preparation,
- appropriate use of professional knowledge,
- careful consideration of alternatives,
- genuine curiosity about ideas and about learners,
- exercise of professional judgment,
- collegial work on teaching,
- respect for children, peers, and other professionals,
- analysis and reflectiveness,
- skills of ongoing professional learning,
- clear expression,
- organization, and
- timeliness.

The decisions I make about grading (when to give feedback, when to assign grades, how to weight assignments, etc.) are based on considerations similar to those used by all classroom teachers. Note that your ability to carry out of the key practices on which we are working is central to determining your final grade for this course. Your final grade will be determined as follows, based on the quality of your enactment of each of the course requirements. I will provide detailed guidance about what is involved in skillful performance of each of these.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percentage of Final Grade</th>
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<tr>
<td>Weekly assignments (average)</td>
<td>15%</td>
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<tr>
<td>Explaining a mathematical idea</td>
<td>5%</td>
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<tr>
<td>Student interview in field placement (February)</td>
<td>10%</td>
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<tr>
<td>Student interview in field placement (March/April)</td>
<td>15%</td>
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<tr>
<td>Targeted instruction: Plan</td>
<td>10%</td>
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<tr>
<td>Targeted instruction: Video reflection</td>
<td>15%</td>
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<tr>
<td>Student progress memo</td>
<td>10%</td>
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<tr>
<td>Final Exam</td>
<td>20%</td>
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Your final grade will be based on the percentage of points you've earned relative to the maximum points possible (100). Percentages will be translated into letter grades using the following system:

- A+ : 98%-100%
- A  : 93%-97%
- A - : 90%-92%
- B+ : 88%-89%
- B  : 83%-87%
- B - : 80%-82%
- C+ : 78%-79%
- C  : 73%-77%
- C - : 70%-72%

A final score of lower than 70% will constitute failure of the course.

Accommodations:
If you think you need an accommodation for a disability, please let me know at your earliest convenience. Some aspects of this course, the assignments, the in-class activities, and the way the course is usually taught may be modified to facilitate your participation and progress. As soon as you make me aware of your needs, we can work with the Office of Services for Students with Disabilities (SSD) to help us determine appropriate academic accommodations. SSD (734-763-3000; http://ssd.umich.edu) typically recommends accommodations through a Verified Individualized Services and Accommodations (VISA) form. Any information you provide is private and confidential and will be treated as such.
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Tentative Course Schedule

Wednesday, February 12  (CLASS #1)
In class: This class will launch work on eliciting and interpreting students' thinking in mathematics. We will also launch work on fractions by considering the definition of a fraction in the Common Core State Standards and using the definition with area models (such as shaded parts of rectangles).
Assignment:
- Explaining a mathematical idea assignment

Wednesday, February 19  (CLASS #2)
In class: We will continue work with the Common Core Definition of a fraction by applying the definition to the number line. We will also consider key properties and conventions of the number line. We will continue our work on eliciting student thinking by preparing together for the student interview you will conduct in your field placement.
Assignment:
- Interview a child in your field placement classroom

Wednesday, February 26  (CLASS #3)
In class: This class will focus on eliciting and probing student thinking. We will also consider what we can learn from written assessments. We will also continue work on developing mathematical knowledge related to fractions that is useful in teaching, with focus on comparing fractions. We will also begin to prepare together for the interview that you will be conducting with a student at Mitchell in Class #5 by focusing on unpacking the mathematics of problems, interpreting students' written work, and designing questions to elicit and probe students' thinking.
Assignment:
- Plan for your interview at Mitchell

Wednesday, March 5
No class, Spring Break

Wednesday, March 12  (CLASS #4)
(meet at Mitchell Elementary School)
In class: You will interview a fifth grade student at Mitchell about his/her work on a fractions quiz. Afterward, we will debrief the interviews and identify common patterns in students' thinking. We will also work on developing mathematical knowledge related to fractions that is useful in teaching, with a focus explaining multiplication of fractions in a way that is likely to support students' learning.
Assignment:
- Submit a video of your interview at Mitchell
- Identify a targeted instruction learning goal for your student
- Drafting a plan for your targeted instruction session
Wednesday, March 19 (CLASS #5)
In class: This class will focus on features of good explanations. The class will include opportunities to receive feedback on your plan for your targeted instruction session including rehearsing the explanation that you will provide during the session and designing an end-of-targeted instruction assessment. We will also work on developing mathematical knowledge related to fractions that is useful in teaching, with a focus on equivalent fractions.
Assignment:
• Plan for targeted instruction should be revised after class and turned in by 5 p.m. on Friday, 3/21. You will receive feedback on your plan and you should come to our next class ready to enact the targeted instruction.
• Conduct a second student thinking interview in your field placement between March 24 and April 4

Wednesday, March 26 (CLASS #6)
(meet at Mitchell Elementary School)
In class: You will conduct a targeted instruction session with a fifth grade student at Mitchell. We will also launch focused work on making assertions based on students’ verbal explanations.
Assignment:
• Targeted Instruction: Video Reflection
• Conduct a second student thinking interview in your field placement between March 24 and April 4

Wednesday, April 2 (CLASS #7)
In class: We will continue to work on explanations of mathematics content, with a focus on division of fractions. We will also continue work on making assertions about students’ thinking based on student’s verbal explanations.
Assignments:
• Drafting student progress memo
• Conduct a second student thinking interview in your field placement between March 24 and April 4

Wednesday, April 9 (CLASS #8)
In class: We will continue work on making assertions about students’ understanding based on their written work. You will have opportunities to receive feedback on your student progress memo from your peers. We will also summarize our learning in the course by summarizing common patterns in students’ thinking we have learned about throughout the semester.
Assignment:
• Student Progress Memo is due on April 15 at 5:00 p.m.

Review session for the final exam (Wednesday, April 23 from 1:00 p.m. - 3:00 p.m.)
You will receive a study guide for the final exam. A study session will be held to provide an opportunity for you to meet and work with colleagues. Course instructors will be at the session, and can help clarify questions or help you find things. We can answer questions on topics or ideas that you are reviewing. We can watch you give mathematical explanations and give you feedback. However, we will not go over possible responses to the questions, or other kinds of detailed help specific to the final.
Final Exam: (During exam week, date/time T.B.D.)
This exam will assess:

- your knowledge of mathematics for teaching and your ability to use that knowledge in teaching;
- your sensitivity and skill at attending to students’ mathematical ideas and interpreting what they think and know;
- your knowledge and skills with respect to designing and enacting instruction for students in classrooms, as well as your ability to observe, attend to, and analyze teaching and learning; and

The exam will be open-book and you will be able to draw upon the notes that you have taken all semester. In addition to the paper and pencil portion of the final exam, you will also complete a performance assessment where you explain and represent one of the ideas about fractions that we have been working on in class.