EDUC 263B: Curriculum & Instruction in Mathematics
Remote
Tuesdays, 3:00 - 5:50 pm

Teaching Team:
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Office hours by appointment

Introduction
This is the second of a 3-course sequence focused on mathematics teaching and learning. The 3-course sequence is designed to create an opportunity for sustained learning and professional growth.

This quarter we will examine two crucial and closely connected aspects of classroom instruction: **planning lessons and assessing student learning**. We will discuss approaches to the "backward design" of curricula in which educators begin their planning with a vision of the understandings they want their students to achieve and of the dimensions of performance that would demonstrate those understandings. We will explore and map important understandings in secondary mathematics and the misconceptions often held by students.

We will also consider **different forms of assessment** – formative and summative - noting the importance of designing assessments that match our instructional goals: assessing understanding in multiple ways, offering rationale for each design and goal, and integrating assessment and instruction.

We will also examine dimensions of mathematics instruction teachers must consider as they prepare lessons: informal assessment, participation structures, selection and implementation of tasks, and the role of the teacher in the lesson. There will be a joint focus throughout the course on research and practice. Journals and other assignments will encourage you to learn from both course readings and your classroom placements through informed reflection.

We will also explore problem solving as a teaching approach. Before you can develop in students the skills to solve mathematical problems, you need to know yourself as a problem solver, and you need to know particular processes involved in problem solving. Throughout the quarter, we will inspect and work on a set of mathematical tasks that will help us accomplish both of these goals.

We will engage in tasks in class, using a variety of formats: individual, pairs, groups and whole class. We will delve deep enough into the tasks to illustrate an important aspect of problem-solving, but you may need to continue pondering and working on the extensions outside of class. In addition to reflecting on your own mathematical experience with each task, we will

systematically consider the mathematics likely to surface, the background skills needed to access the tasks, and the range of approaches students are likely to take.

Course Requirements

We expect you to come to class having completed the reading and assignments due for that day and prepared to participate in class discussions and activities. Attendance to all sessions is mandatory. Please give us ample notice if you must be late or need to miss a class.

Assessments and Grading

Your assignments for this quarter are (Please refer to Canvas for detailed descriptions):

- Due September 28th by 10:00 PM   Maths Histories Analysis
- Due October 13th (bring to class)   Listening Transcript
- Due November 24th by 10:00 PM   Assessment for Learning (A4L)

Your grade will be based primarily on the quality of the assignments mentioned above. We will also take into account your attendance, and your active contributions to class discussions. As with all your work in C&I this year, you may revise and resubmit any written assignment for a higher grade.

All assignments should be digitally submitted to **Canvas** unless otherwise specified by the instructors. All assignments should be uploaded to the assignment in Canvas **no later than 10 pm on the due date**. If you have extenuating circumstances and would like to request an extension, please do so before the deadline. All feedback will be provided digitally within your submitted documents. Please turn in all assignments as Microsoft Word documents. It is fine to embed photographs in the word document, and we really appreciated having one continuous file for each assignment. It is difficult to comment on pdf files, and we are certain we can open your assignments if they are saved in Word.

Please save all files using the following naming convention: Lastname_Assignment.docx. For example: Leshin_Journal Reflection.docx As teachers you will appreciate the ease of tracking one clearly labeled document per student.

University Policies

All Stanford students are expected to follow the **Stanford Honor Code** and **Fundamental Standard**, as noted in the STEP Handbook and Stanford Student Guide.
http://www.stanford.edu/dept/vpsa/judicialaffairs/about/welcome.htm

Students with Disabilities

Students who may need an academic accommodation based on the impact of a disability must initiate the request with the Office of Accessible Education (OAE). Professional staff will evaluate the request with required documentation, recommend reasonable accommodations, and prepare an Accommodation Letter for faculty dated in the current quarter in which the request is being made. Students should contact the OAE as soon as possible since timely notice is needed to coordinate accommodations. The OAE is located at 563 Salvatierra Walk; phone: (650) 723-1066; web site http://studentaffairs.stanford.edu/oae

Week	Topic	Readings	Assignments
1 9/22	Equitable Groupwork	● Boaler, J. (2015). *Mathematical Mindsets*. Ch. 7. Tracking to Growth Mindset grouping.	
2 9/29	Listening to student thinking	● Kazemi, E. (1998). Discourse that promotes conceptual understanding. *Teaching Children Mathematics. 410-414.* ● Schifter, D. (2001). Learning to see the invisible. What skills and knowledge are needed in order to engage with students' mathematical ideas? In T. Wood & B. Scott Nelson & J. Warfield (Eds.), Beyond classical pedagogy: Teaching elementary mathematics. Mahwah, NJ: Lawrence Erlbaum Associates (pp. 109-134).	Maths Histories Analysis **DUE: *Monday, 9/28 by 10 pm***
3 10/6	Working with English language learners Guest: Jack Dieckmann	● Moschkovich, J. (2013). Principles and Guidelines for Equitable Mathematics Teaching Practices and Materials for English Language Learners. Journal of Urban Mathematics Education, 6(1).	
4 10/13	Teacher Questions	● Erlwanger, S. H. (1973). Benny's conception of rules and answers in IPI mathematics. *Journal of Children's Mathematical Behavior*, *1*(2), 7-26.	Listening transcript **DUE: *Tuesday, 10/13 (in class)***
5 10/20	A4L 1: The big picture	● Boaler, J. (2015). *Mathematical Mindsets*. Ch. 8. Assessment for a Growth Mindset	
6 10/27	A4L 2: Planning a Sequence of Lessons	● Boaler, J., & Zoido, P. (2016, November 1). Why Math Education in the U.S. Doesn't Add Up. *Scientific American*. Retrieved from https://www-scientificamerican-com.stanford.idm.oclc.org/article/why-math-education-in-the-u-s-doesn-t-add-up/	
7 11/3	A4L 3: Crafting diagnostic comments	● Deborah Ball video on eliciting student thinking MSRI interview of 6th grader—watch on your own http://www.msri.org/workshops/696/schedules/16544 (15 minute segment to be selected)	

8 11/10	Backwards Design: Big Ideas and Learning Objectives	● Boaler, J. (2015). *Mathematical Mindsets*. Ch. 3. The Creativity and Beauty in Mathematics ● Boaler, Munson, & Williams (2017). What is mathematical beauty? Teaching through big ideas and connections. https://bhi61nm2cr3mkdgk1dtaov18-wpengine.netdna-ssl.com/wp-content/uploads/2017/08/What-Is-Mathematical-Beauty-1.pdf	
9 11/17	Refining, revising, and launching tasks	● Boaler, J. (2015). *Mathematical Mindsets*. Ch. 5. Rich Mathematical Tasks.	A4L **DUE: *Tuesday, 11/24 by 10 pm***
10 12/1	Big ideas in tasks	● Boaler, J. (2015). *Mathematical Mindsets*. Ch 9. Teaching Mathematics for a Growth Mindset	