# MATH 123
## Community Math Teaching Project
## Spring 2005

# 1 Technical Information

Math 123, the Community Math Teaching Project , meets twice a week. Through DATE, we meet on Monday and Wednesday from 10am-12pm in DRL ROOM. From DATE onwards, we meet on Mondays from 10am-12pm in DRL ROOM and on Wednesdays from 10am-12pm at University City High School (36th and Filbert Streets).

**Instructor:** Sarah Mason
**Office:** DRL 3E2
**E-mail:** sarahm2@math.upenn.edu
**URL:** http://www.math.upenn.edu/~sarahm2
**Office Hrs:** Monday 12-1pm; Tuesday 3-4pm; or by appointment
**Course Web-site:** www.math.upenn.edu/~sarahm2/m123/2005.html

**Assistant:** Dennis DeTurck
**Office:** DRL 3E1
**E-mail:** deturck@math.upenn.edu

# 2 Goals of the Course

In this course, you will:

- Learn new ideas in geometry and examine your understanding of previously learned geometry;
- Develop effective methods for teaching with understanding; and
- Explore the context in which geometry is taught in high school.

# 3 Course Structure

## 3.1 In the Classroom.

This class will be split between sessions at Penn and sessions at University City High School (UCHS). For the first four weeks of class, we will be at Penn full-time. We will use this time to refresh your geometric knowledge, to discuss pedagogical strategies, and to learn about the context in which you will be teaching.

Once the UCHS semester begins, we will spend one class per week at Penn and one class per week at UCHS. The Penn session will be devoted to specific preparations for the upcoming UCHS session: discussing issue's brought up in the previous weeks's UCHS session, exploring the specific geometric topic of the week, and analyzing the week's geometry activity in preparation for teaching it. The activities are designed to do one or more of the following:

1. Reinforce concepts taught during the regular class with which students usually have trouble;

2. Place concepts in new comtexts and make connections between them;

3. Enrich the students' experiences by showing them geometry they ordinarily would not see.

During the UCHS session, we take over Scott Koehler's 10th grade geometry class for one hour. You are responsible for bringing copies of the labs and any materials necessary to do them (materials and copies will be given to you in class at Penn on Monday). You will usually be working two-on-two or one-on-two with UCHS students, guiding them through the geometry lab. At the end of the lab, both you and your student(s) will evaluate how the lab went, and you will provide additional feedback to your students(s).

After our hour with Mr. Koehler's students, we will meet in a different room at UCHS for debriefing and discussion.

## 3.2 Weekly Readings.

You should come to the Monday classes having read:

- The chapters of the UCHS students' textbook that they have gone through that week (I will post the appropriate chapters the previous Wednesday on Blackboard)

- The week's lab (again, posted the previous Wednesday on Blackboard)

- Any articles handed out the previous Monday (these will generally not be all that long, especially after we begin teaching the labs.)

All course materials will be provided by the Penn math department and the Access Science program. (e.i. This is a no cost class.)

## 3.3 Assignments and Grading.

Your grade in this course will be based on three criteria:

**Class Participation (50%):** This includes your contribution to class discussions and math activities at Penn as well as your dedication to teaching at the UCHS classroom. You will NOT *By taking this class, you are making a commitment to your student(s),*

*so attendance is essential. Even one unexcused absence will be detrimental to your class participation grade.*

**Journal (20 %):** You should keep a journal (with at least weekly entries) that records your thoughts about:

- Your experience in the UCHS classroom: What motivates your student? What are your student's preconceptions about the material? What techniques worked and should be continued? What needs to be improved (and how will you improve it)?
- The readings and in-class activities: How (if at all) do they relate to your own educational experience? How (if at all) do they relate to to your experience in the UCHS classroom? How can you incorporate ideas from them into your teaching?

These questions are just to get you started. Feel free to explore what interests you-you can even write about the geometry itself if you want! You should keep your journal in electronic format and e-mail it to me by 5pm **EACH FRIDAY**. It doesn't have to be long (a paragraph or two each week is fine) but please put some thought into it.

**Project (30 %):** You and a group of Penn students will create your own geometry activity. The process of completing your activity will be spread out over the semester, with both individual and group checkpoints roughly once every two weeks after we start going to UCHS; the deadlines are listed in the schedule below. We will teach the student activities to the UCHS students during the last two weeks of class.

## 3.4 Weekly Schedule

[The topics in the following schedule are subject to change:]

| Monday | Wednesday |
|---|---|
| **10 January**<br>Preconceptions, understanding,<br>and some geometry | **12 January**<br>Student Backgrounds<br>(guest speaker: Katie Schu) |
| **17 January**<br>MLK Holiday<br>No class | **19 January**<br>Motivation and Personality<br>(guest speaker: Dr. Chris Massey) |
| **24 January**<br>Teaching Strategies<br>Classroom observations | **26 January**<br>More geometry<br>Classroom observations |
| **31 January**<br>Prepare first UCHS activity<br>Geometric Proof | **2 February**<br>First UCHS Day<br>Pick's Theorem |
| **7 February**<br>Definitions and descriptions<br>*Choice of group members due* | **9 February**<br>Geometry Taboo |
| **14 February**<br>Fractal Dimension<br>Urban education / *brainstorm of topics due* | **16 February**<br>"A Long Snowflake" |
| **21 February**<br>Bits/binary digits<br>*Choice of topic due* | **23 February**<br>"Digital Cameras" |
| **28 February**<br>Constructions<br>*Rough outline of activity due* | **2 March**<br>"Blueprints" |
| **7 March**<br>Spring Break<br>No Class | **9 March**<br>Spring Break<br>No class |
| **14 March**<br>Transformation Geometry<br>Metacognition | **16 March**<br>"Symmetry" |
| **21 March**<br>Trigonometry<br>*rough draft of activity due* | **23 March**<br>"Straight Shooters" |
| **28 March**<br>Right triangles on spheres<br>Understading the PSSA / *list of materials due* | **30 March**<br>"Pythagorean Proof" |
| **4 April**<br>Euler Characteristic<br>"The Math Wars" / *final draft of activity due* | **6 April**<br>"Platonic Solids" |
| **11 April**<br>Standards and policy | **13 April**<br>Student Activities |
| **18 April**<br>"No Child Left Behind" | **20 April**<br>Student Activities |