

CURRICULUM PROJECT

Even an outstanding undergraduate education will not teach all the mathematics that you will need to know in order to be an outstanding mathematics teacher. Once you are teaching on your own, you will encounter unfamiliar areas of mathematics that you will be responsible for learning on your own and then teaching. What will you do? This curriculum project asks you to investigate a, possibly unfamiliar, area of the elementary mathematics curriculum and consider what teachers need to know to teach it well and what children need to learn to understand the topic in the deep and meaningful ways suggested by *The Principles and Standards for School Mathematics* (<http://www.nctm.org>) and the Common Core State Standards in Mathematics (<http://www.corestandards.org>).

You will work in groups on this project. The group assignments are:

Groups	Topics	Curriculum Materials
1	Algebra	Houghton Mifflin Math K-2
2	Geometry	Houghton Mifflin Math K-2
3	Measurement	Houghton Mifflin Math K-2
4	Algebra	Houghton Mifflin Math 3-5
5	Geometry	Houghton Mifflin Math 3-5
6	Measurement	Houghton Mifflin Math 3-5

With a particular mathematical topic in focus, the project consists of the following parts:

- 1) Read, analyze, and synthesize the relevant grade band (K-2 or 3-5) for your topic in The Common Core State Standards for Mathematics (<http://www.corestandards.org>). What should be taught in this area at this grade level? What does a child need to know to be able to understand the topic in the ways suggested by the standards?
- 2) Read, analyze, and synthesize the relevant grade band expectations for *The Principles and Standards for School Mathematics* (<http://www.nctm.org>) process standards (choose two, one of them should be "problem solving"). What should be taught about these two process standards within this grade band? What does a child need to learn to understand the meaning of these two process standards?
- 3) Study the curriculum materials you have chosen. How well do the materials address your topic? Do you find the topic in the *Common Core State Standards*? What similarities and differences exist between what you find in the curriculum materials and what you found in the standards around this topic? Analyze and synthesize your findings.
- 4) Select and work out 4 sample math problems that address the standard that your project studies. Taken together, the problems should engage teachers in learning mathematics they need to know to teach the topic well. The problems need to be appropriate for college students preparing to be teachers. Identify the important mathematics the problem would help teachers learn. Explain how working on the problem provides teachers an opportunity to learn the mathematics they need to learn to teach the topic well to children.
- 5) Select and work out 4 sample math problems that address the standard that your project studies. Taken together, the problems should help children learn mathematics in deep and meaningful ways. The

problems need to be grade level appropriate and hold children to high expectations. Explain how working on the problem provides children an opportunity to learn the mathematics they need to learn to have a deep and meaningful understanding of the topic.

6) Your project (only findings about the textbooks) will be presented in class using 15 minutes. This will allow us to see the learning trajectories of different topics reflected by the textbook materials.

Projects

Description: A project is a multi-step assignment, which because of its complexity typically takes more than a week to complete. You have completed one project working in pairs. For the curriculum project you will work in a group of four.

Group Roles: It is important for each member of a group to get involved and help the group function smoothly. Sometimes it helps if each person in the group adopts a specific role, such as: chair, reporter, scheduler, researcher or scribe. The chair should organize the group, making sure everyone gets involved in the process and understands the ideas being put forward. The reporter's job is to jot down the ideas of the group as they are being discussed. The scheduler should find times and places where everyone in the group can meet and should make sure that the group meets often enough to finish the project. Researchers (you may need more than one) review literature, search the web, etc. finding the sources the group needs to prepare their report. The scribe writes up the final report for the group. These roles can rotate among the members of the group and no one should feel limited to their specific role. In particular, everyone should help the scribe by, at the very least, proofreading the final draft of the report.

The Written Report: Your report must be typed. **Each member of your group should sign their name on the front page of your project.** Your signature certifies that you have participated to a fair degree in the work of the project and that you are entitled to your share of the credit for the project and that everyone you permit to sign the report has also earned the right to sign the report.

Part of your grade will be based on the quality of your report, above and beyond its mathematical and pedagogical content. Use complete sentences, good grammar and correct punctuation. Spelling is also important. The report should be written in such a way that it could be read and understood by other students in the Elementary Education program. At the end of your report, include a paragraph describing the roles of each member of the group, how many times the group met, how the group functioned, etc.

- **How long should the curriculum project report be?** You may be able to write a 10 – 20 page report that is of high quality, but we have had groups that write a much longer report. We encourage you to use pictures, diagrams, graphs, tables, and charts to help you represent your ideas throughout the paper. You should communicate important mathematics in each part of your report.
- **Evaluation.** All members of the group will receive the same grade on the project. The project is worth 50 points and will count toward your grade in TEAC 308 and Math 300. If concerns are expressed regarding whether the work has been a group effort, we may ask members of the group to meet with us and explain the project report. All members of the group must understand the group's report and be able to explain it to us.
- **A public document.** In addition to the paper copy that you submit to us, we will want you to provide us with an electronic copy. We will use Blackboard to share your work with others in the class. The curriculum project is your opportunity to demonstrate your ability to work as part of a team and to produce a high quality report. Personalize your report so that it is uniquely yours.
- **A group effort.** Part of the challenge of this project is to work together as a team to complete the project. At times you will work together, other times alone. Consider how to divide tasks to accomplish the project. We are available for help. Please come as a group when meeting with either of us.