

Instructions for Math 181 Projects

With Options for Unit 3: Operations with Rational Numbers

Recall that you are expected to complete two projects in this class by selecting 2 projects from the 3 units in the table below. At least one of your projects must be completed in a small group consisting of 2-4 members. Refer to the table below for deadlines associated with each unit.

Possible Units for Projects (Choose 2)	Project Deadline
1. Meaning of Numbers	October 28
2. Operations with Whole Numbers and Integers	November 18
3. Operations with Rational Numbers	The Final Exam Meeting Time

Project Guidelines:

1. You have a choice of what you'd like to produce for your project. You may produce a written report, news article, information brochure, poster, powerpoint presentation, website, radio interview, skit, short story, puppet show, letter, persuasive essay, poem, song, scrapbook, or some other appropriate product or performance.
2. All projects should utilize and cite at least four resources. Resources may include books, journals, credible websites, and/or individuals that you consult. At the end of your project, include a listing of all of your resources. Below you will find examples of how to cite different types of resources.
3. You'll present (individually or as a group) your project to the class on the day the project is due.
4. Each project will be evaluated with the same project rubrics (see Unit 1 instructions). The rubric scores correspond to letter grades in the following way:

Rubric scores of...	correspond to a grade of...
3.5 – 4.0	A
3.0 – 3.4	B
2.0 – 2.9	C
1.0 – 1.9	D
0 – 0.9	F

Examples of How to Cite Resources:

- Book: Beckmann, S. (2008). *Mathematics for elementary teachers*. Boston, MA: Pearson.
- Journal Article: Putnam, R. T., & Borko, H. (2000). What do new views of knowledge and thinking have to say about research on teacher learning? *Educational Researcher*, 29(1), 4-15.
- Website: National Renewable Energy Laboratory. (2008). *Biofuels*. Retrieved May 6, 2008, from: http://www.nrel.gov/learning/re_biofuels.html
- Individual you Consulted: R. Pugliese, personal communication, March 23, 1990.

Unit 3 Project Options

Reminder: Note the new deadlines for submitting your project.

Option 1: Select a project from Unit 2

The end of the semester is quickly approaching, and we will not be able to cover as much in the unit on Operations with Rational Numbers as I had hoped. Thus, if you are doing your second project from this unit, you may select from the options below or you may select from the options in the Unit 2 handout.

Option 2: Bank of Fraction Word Problems

You decide to prepare a bank of fraction word problems that you will save as a resource for when you are teaching. In your bank, be sure to include several examples of word problems for adding, subtracting, multiplying, and dividing fractions. These word problems need to be about interesting contexts or stories. Also, for each word problem, solve the problem and include an illustration (drawing) of how to solve the problem. Finally, include a written description of what teachers need to attend to in writing word problems with fractions.



Option 3: I thought multiplication always made bigger?

Elementary students often assume that multiplying any two numbers results in a larger number and dividing any two numbers results in a smaller number. You are soon going to be introducing rational numbers to your students and want to help them correct this assumption. Describe at least two ways that you may help students avoid each of these incorrect assumptions. Include drawings, manipulatives, and explanations that you would use to help you do this.



Option 4: Math Story Time

You've noticed that many students enjoy when the teacher reads a book to the class with illustrations, and you know this story time can be especially good for introducing vocabulary words for students to think about. Create a fun picture book that tells a story of one or more people (or things) that are struggling to learn some aspect of operations on fractions (addition, subtraction, multiplication, division). Include appropriate math vocabulary words in your story, and include illustrations related to both the mathematics and the events in the story.



Option 5: Create a Concept Map for a Unit in an Elementary Mathematics Book

Find a mathematics textbook used in Grades 3-5, and pick a unit or chapter related to operations on fractions (addition, subtraction, multiplication, division). Investigate the activities and exercises that students would do in this textbook, and prepare a concept map describing the fraction content and the ways in which students would learn it. In creating the concept map, try to show how the ideas in the unit connect to one another and how the ideas may connect to students' prior understanding.



Option 6: Create a Math Game

Thinking of what you've learned about operations on fractions (addition, subtraction, multiplication, division), invent a mathematics game for elementary students. Your final product must include any special materials needed to play the game, an instructions manual for players who are new to the game, some tips for doing well in the game, and a brief description of how the game has been designed in order to be accessible to students with different learning preferences (e.g., auditory, visual, kinesthetic, etc.).



Option 7: Your Choice

If you wish, you may develop another math project in this unit in collaboration with me. See me ASAP if you want to work with me to develop your own project.