

Instructions for Math 181 Projects

With Options for Unit 2: Operations with Whole Numbers and Integers

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)	Select a Project by...	Submit your Project by...
1. Meaning of Numbers	September 16	October 28
2. Operations with Whole Numbers and Integers	October 21	November 18
3. Operations with Rational Numbers	November 6	December 4

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:

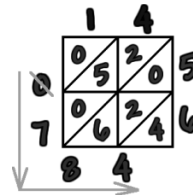
- Book: Beckmann, S. (2008). *Mathematics for elementary teachers*. Boston, MA: Pearson.
- Journal Article: Putnam, R. T., & Borko, H. (2000). What do new views of knowledge and thinking have to say about research on teacher learning? *Educational Researcher*, 29(1), 4-15.
- Website: National Renewable 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 2 Project Options

Reminder: Note the deadlines for choosing an option and submitting your project.

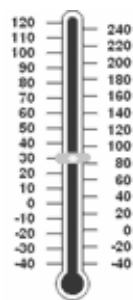
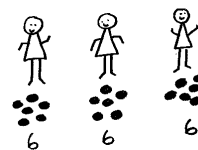
Option 1: A Library of Alternative Algorithms

As we have seen in class, students often use different algorithms to add, subtract, multiply, and divide whole numbers. You want to create a library of such different algorithms to refer to when you begin teaching. In your library, be sure to include at least 8 alternative algorithms (2 for addition, 2 for subtraction, 2 for multiplication, and 2 for division). In addition, be sure to describe how you know each algorithm works for all numbers, include examples with different types of numbers for each algorithm, and discuss when each algorithm is most efficient.



Option 2: Generating More Interesting Word Problems

You have been hired as a consultant for a test production agency. They too use the Taxonomies for Addition, Subtraction, and Multiplication Word Problems. They have hired you to help them write different types of word problems in these categories. They have found in the past that they tend to keep using the same story lines. As part of your job, they have asked you to provide at least two word problems for each type. These word problems need to be about interesting contexts or stories. Also, for each word problem, they would like you to solve the problem and include an illustration (drawing) of how elementary students might solve the problem.



Option 3: Preparing to Teach Negative Numbers

You are getting ready to teach a lesson to upper elementary students on negative numbers. As you begin planning, you realize that your students will likely want to know where negative numbers come from. In addition, you know that negative numbers can be challenging for students to learn, so you want to find teaching ideas that will really help them understand. To help you with this, you decide to prepare a report. Your fellow teacher also needs to teach negative numbers, and so you have promised to provide him/her with a copy of your report. In your report, you decide to include a history of negative numbers and a variety of ideas for how to teach negative numbers so that students really understand them and how to add, subtract, and multiply negative numbers.

Option 4: Why Does a Negative and a Negative Produce a Positive?

One day someone asks you, “When people say a negative and a negative is a positive, what do they mean?” This gets you to thinking, “Yeah, what do they mean?” You decide to research this topic and then give a presentation about it at an upcoming conference for elementary teachers. After doing some research, you quickly learn that the idea a negative and a negative is a positive can apply to two situations: 1. Subtracting a negative number has the same end result as adding the positive version of that number, and 2. Multiplying a negative number times a negative number has the same net effect as multiplying the positive versions of those two numbers. Thus, for your presentation, you decide to include two arguments for each of these situations. Each argument must demonstrate why the rule works, e.g., explain or illustrate why the result is what it is rather than just a repetition of the rules that subtracting a negative is like adding and multiplying two negative numbers results in a positive number.



Option 5: 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.