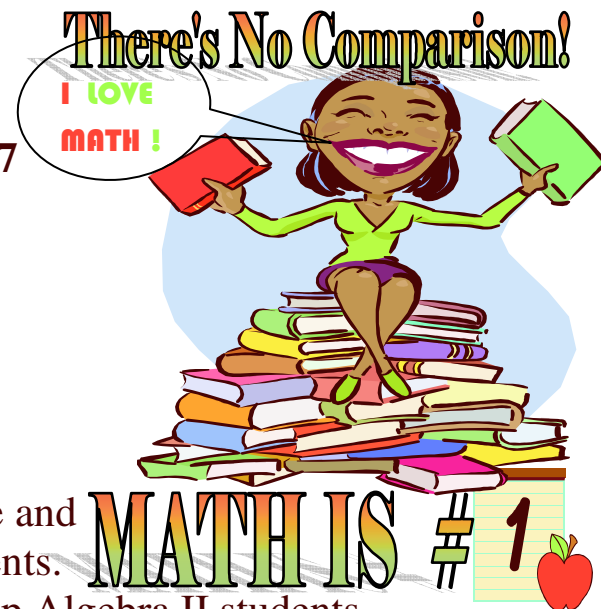


## Algebra/Geometry Institute Summer 2007

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9<sup>th</sup>-12<sup>th</sup> Grade (Algebra II)






### *Teaching Objectives*

The student will be able to compare and order fractions, decimals, and percents. (The purpose of this lesson is to help Algebra II students gain a better conceptual understanding of this objective.)

### *Instructional Activities*

I will begin by asking the class what they remember about fractions, decimals, and percents. I will allow three minutes for responses. After listening to student responses, I will go over the definitions of fraction, decimal, and percent.

-  fraction—part of a whole; one number (numerator) that is divided by another number (denominator) that is not zero.
-  decimal—a proper fraction whose denominator is a power of ten
-  percent—means per 100; numbers that are written as part of 100 followed by a percent symbol (%)

Once these definitions have been reviewed, I will list a group of fractions ( $\frac{1}{3}$ ,  $\frac{1}{6}$ ,  $\frac{1}{12}$ ) on the board. I will work with the students to help them order this group of fractions by finding common denominators. Students will then be given a group of fractions ( $\frac{1}{4}$ ,  $\frac{1}{2}$ ,  $\frac{1}{8}$ ) to order on their own. I will then list two groups of decimals (0.25, 0.45, 0.33) and (0.60, 0.35, 0.75) and order the first group by checking the place values and ordering them accordingly. Then I will

list two groups of percents (25%, 45%, 10%) and (37%, 82%, 7%) and order them by placing them over 100. Finally, I will list two groups comprised of a mixture of the three (20%, 0.75, and  $\frac{7}{8}$ ) and (30%, 0.67,  $\frac{1}{6}$ ). Before ordering these, however, I will do the following activity with fraction tiles.

I will use fraction tiles to show students how to order fractions and how this can be incorporated into comparing and ordering decimals and percents as well. Students will be given a set of fraction tiles containing one whole, halves, thirds, fourths, fifths, sixths, eighths, tenths, and twelfths. I will demonstrate to students how to model the fractions from the first two example problems. During this demonstration, I will also associate the fractions in the examples to their decimal and percent equivalents by shading pie charts on the board. Students will then use the fraction tiles to model the fractions  $\frac{1}{4}$ ,  $\frac{1}{5}$ ,  $\frac{1}{6}$ ,  $\frac{5}{12}$ ,  $\frac{5}{8}$ ,  $\frac{9}{10}$ ,  $\frac{3}{4}$ , and  $\frac{7}{8}$ . They will then use the fraction tiles to compare  $\frac{1}{4}$  to  $\frac{1}{5}$ ,  $\frac{1}{5}$  to  $\frac{1}{6}$ ,  $\frac{3}{4}$  to  $\frac{7}{8}$ , and  $\frac{5}{8}$  to  $\frac{5}{12}$ . Students will also be asked to show shaded decimal and fraction equivalents by drawing shaded pie charts on their papers next to each of the fraction comparisons. After showing students how to model, they will be instructed to order the last two groups of numbers.

The purpose of this lesson is to help students in Algebra II who have not mastered these skills gain a better understanding of the conceptual reasoning behind ordering numbers. After being shown various methods of ordering numbers, the students will be given an opportunity to utilize the method they feel the most comfortable with. Therefore, an “Ordering Advertisement” will be used to evaluate their understanding of the concepts covered.

In this activity, students will be split into groups of five. Each student will be assigned a task. Students will use their knowledge of ordering fractions decimals, and percents to choose one method to order a given set of numbers. Using their chosen form, the groups will justify why they think their method is the best method to use for ordering numbers. Students must explain an example problem to the class. Grades will be assigned based on individual tasks performed as well as on how the group performs overall.

### ***Materials and Resources***

Fraction tiles

“Comparing and Ordering Advertisement” worksheet

\*Worksheet adapted from [www.mathwarehouse.com](http://www.mathwarehouse.com) “Math Advertisement” activity.

### ***Assessment***

Observation of student responses in class will be one method I will use for assessment. Also, justification of their reasoning for problem solutions to the in-class examples will be used. I will grade the “Ordering Advertisement” activity as well.

# Comparing & Ordering Advertisement

Description and Objective

**Create an advertisement for one of the methods for ordering numbers.**

**YOUR OBJECTIVE:** To sell your mathematical product which, in this case, is your chosen method!

What your advertisement **MUST** include:

- 1) A Catchy Slogan
- 2) A Nice Looking Logo
- 3) Clear definitions of important terms
  - a. Example problem
- 4) What steps someone would take to use your method
- 5) A clear argument stating **the reasons why** your method is better than the other ones. (In other words, come up with a few good sentences that explain why you chose your method and why others should too!)

## Procedure

**Task #1)** Your group needs to choose which method it will advertise.

**Stance 1)** Why using **fractions only** is the best way to compare and order numbers.

**Stance 2)** Why using **decimals only** is the best way to compare and order numbers.

**Stance 3)** Why using **percents only** is the best way to compare and order numbers.

**Stance 4)** Why using **a combination of two or more methods** is the best way to compare and order numbers.

**Task #2)** Assign roles to each member in your group.

### Roles

**Logo Maker :** \_\_\_\_\_  
(creates and designs your advertisement's logo)

**Example Maker :** \_\_\_\_\_  
(person needs to create specific mathematical examples)

**Slogan Maker :** \_\_\_\_\_  
(person responsible for a catchy slogan)

**Definition Maker:** \_\_\_\_\_  
(person responsible for clearly writing all relevant definitions)

**Seller :** \_\_\_\_\_  
( Person responsible for "Clearly stating **the reasons why** your method is better than the other way to find the answer")

**Task #3)** Create the poster!

Adapted from [www.mathwarehouse.com](http://www.mathwarehouse.com) "Math Advertisement"

## **Comparing and Ordering Numbers Activity**

### **GRADING RUBRIC**

<b>Graded Component</b>	<b>Point Value</b>
<b>I. Following Procedures</b> Did you properly follow all the steps in each task?	5 Points
<b>II. Neatness and Clarity</b> Is your work legible and neatly presented? Are your definitions, examples, steps and other parts of the advertisement clearly worded, labeled, and legibly written?	10 Points
<b>III. Quality of Mathematics</b> Did you accurately define all math terms? Did you properly state the steps necessary to use your method? Are your examples good choices to illustrate the benefits of your chosen method?	20 Points
<b>IV. Design: Slogan and Logo.</b> Is your logo and slogan appropriate for your advertisement? Do your logo and slogan work towards selling your method?	7 Points
<b>V. Argument</b> Did you articulate a clear argument for the benefits of using your chosen method? (See #5 under What your advertisement <b>MUST</b> include:)	8 Points

**Total Points: 50**

Rubric courtesy of [www.mathwarehouse.com](http://www.mathwarehouse.com)