

# Ordering and Computing With Negative Fractions and Decimals

## Summary

Order negative numbers. Compute using negative fractions and decimals.

## Main Core Tie

Mathematics Grade 7

[Strand: THE NUMBER SYSTEM \(7.NS\) Standard 7.NS.1](#)

## Materials

Small mirrors or CD jewel cases for reflecting a Numberline.

Paper and scissors for foldable

TI-73's

Students need their Foldables from Sept [Lesson 4](#) and October [Lesson 1](#) and [2](#)

3x5 or 4x6 cards (cut up card stock works fine)

Worksheet: [Locating and Ordering Fraction and Decimal Numbers Using A Numberline](#)

## Background for Teachers

Enduring Understanding (Big Ideas):

Between any two rational numbers lies an infinite number of rational numbers. Fraction and decimal computation.

Essential Questions:

How is finding the approximate locations of rational numbers on the positive side of a number line similar or different from finding the locations of rational numbers on the negative side of a number line ?

How can I apply the algorithms and rules for operating with positive rational numbers and integers when using negative fractions and decimals?

Skill Focus:

Find location of and compute with negative fractions and decimals

Vocabulary Focus:

Rational number, negative fraction, negative decimal

Ways to Gain/Maintain Attention (Primacy):

technology, writing, game

## Instructional Procedures

Starter: Review

Find the approximate location of each pair of numbers on a number line, and tell which has the greater value of the two.

5, 3

0.25, 0.75

$\frac{2}{5}$ ,  $\frac{1}{4}$

-2, -5

Lesson Segment 1: How is finding the approximate locations of rational numbers on the positive side of a number line similar and different from finding the locations of rational numbers on the negative side of a number line?

Review with students that when two numbers are in different forms, i.e. a fraction and a decimal, writing them in the same form will allow us to compare them more easily. See the foldable made during the Ordering and Comparing Rational Numbers lesson for reviewing converting rational

numbers to different forms.

Flap 1: Fraction to decimal: Divide numerator into denominator, or use on Ti-73.

Flap 2: Decimal to fraction: Write decimal as a fraction in 10ths, 100ths... or use on Ti-73.

Have student use Round Robin so each will share their preference with others for this question:

Q. When you look for where a number is located on the number line, which form would be easier for you to visualize, fraction or decimal?

Q. Why do you think so? (Often visualizing a fraction or part of a number line segment is easier than visualizing a decimal on the number line.) Also, remind students that rounding to half, fourths or tenths can help us locate a number.

Work with the class to complete the attached investigation worksheet, "Locating and Ordering Fraction and Decimal Numbers Using A Numberline", to compare locating positive fraction and decimal numbers with locating fraction and decimal numbers. A mirror (CD jewel case works for a mirror) can be very useful in helping students see the reflection across zero on a numberline thus visualizing what the negative side of the numberline should look like. If you are familiar with using the Numline App on the TI-73, you may want students to use that application to check their comparisons, or to give access to those students who are still struggling with computations.

Using the Numline APP To Compare Rational Numbers

You must have the Numline App downloaded on your calculator, if it is not preloaded. Select .

Choose Numline. In Numline, select Fraction line. Push , and set the window as shown below, except use -1 or -10 as the Start value rather than 0..

After the window is set, . The screen will look like this:

Use the up or down arrow keys to select the fraction (top) or the percent (bottom) indicator. Using the right and left arrow keys, you can move the indicators along the line to find values in increments of tenths and of ten percent intervals.

You may select a different minimum and maximum if you want numbers greater than 1.

To show a specific rational number or compare several rational numbers using the number line, push . Select DrawLabel. Type a rational number and push . Then type another rational number and push . You can compare several rational numbers, percents, or ratios by looking at their distance from 0.

Lesson Segment 2: How can I apply the algorithms and rules for operating with positive rational numbers and integers when using negative fractions and decimals?

Ask students to review their journal notes for Computing With Fractions and for Computing With Decimals from September Lesson 3. Then, ask them to review their Foldable for Operations With Integers Rules from October Lesson 1 and 2 by reading through the examples and notes. Tell them when computing with fraction or decimal numbers, the procedures will be the same, BUT, they must apply the rules for working with negative integers as well.

Use a Three-Flap Foldable to help them take notes on the procedures for operating.

Under the flaps, show these examples and have students write as they work the problems.

A.  $-0.4 + -2.25$

B.  $-1/2 \times -1/4$

The NumLine App can be used to check the addition and subtraction.

Work through several examples with the students using Board Talk Protocol to have them reason and explain to their peers. This protocol helps students listen to other's explanations, so they can learn from each other.

Board Talk Protocol

Two students are randomly selected to come to the board to individually sketch and show their reasoning for the first problem. While the two students are working at the board, the remaining students work in their seats to complete show their ideas for that problem. The students at the board work in separate spaces on the board, so the seated class members will be able to see and compare separate responses. Teacher selects one student at the board to explain to the class what they have

done. The class is told they must each write one GOOD QUESTION about the explanation the student at the board is giving. A good question starts with how, why, what if, or can you clarify?... (Write these GOOD QUESTION starters on the board.) Students must write their good question on their assignment paper as the student is explaining.

After the explaining student finishes, the teacher selects one or two from the class to ask their GOOD QUESTION to the explaining student. The teacher then asks the second student at the board to then explain their approach, especially if they have a different response. The seated students again write a GOOD QUESTION for that explaining student. Or, the teacher may ask the class members to look at both responses on the board and prepare to describe how they are similar or different. number to be the middle man. If they can convert a fraction to a decimal or a percent to a decimal first, they can easily convert to the other form.

Practice: Do Pass-Around-Problem where each team writes either a decimal or a fraction number operations problem using positive/negative signs on the front of a card. On the back of the card, the team shows how they will do the problem. The cards are then rotated to another team. The team looks at the problem, but not at the back where the work is shown. That team works to do the problem on their own papers, and then they compare with the back of the card.

Play Team Challenge Game:

Each team is given four cards with rational numbers (attached). Each team will first plot each number on a number line. They will then choose any two of their numbers and write a problem using one of the four operations. They work their problem on their own assignment papers, and plot the answer on the number line. Teacher selects a team member to come up and write their original numbers. The challenger asks the class plot each of their numbers, then to work through the problem their team has written. Students number the problems on their assignment page according to the team number doing the challenging. The students get four minutes to plot the numbers and to work the problem they have been challenged to do. They may work with their team members to do this. The challenger then chooses any person in the class to show and explain the problem on the overhead, or on a Smart Pa,l or Team Board. If correct, that person's team gets a treat or points. If not, the challenger does the problem for the class and the challenger's team gets the treat.

Assign text practice as needed.

### Assessment Plan

performance tasks, observation

### Bibliography

This lesson plan was created by Linda Bolin.

### Authors

[Utah LessonPlans](#)