PROBLEM SOLVED
MAKING SENSE OF MATHEMATICS

Comparing Decimals
A Closer Look at the Video

After watching the *Comparing Decimals* video, make sense of the mathematics by taking a closer look at the problem situation and solution. Use the questions and comments in bold to help you solve the problem using three different methods.

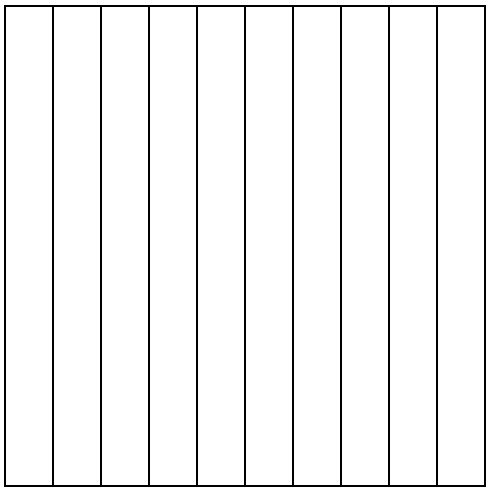
Problem: Rob is the owner of a comic shop called Limited Edition Comic. Each week, Rob ships comics to customers. During week one, Rob shipped 20.4 pounds, and during week two he shipped 20.23 pounds. Was more shipped in week one or week two?

In order to answer this question, we need to determine which is larger, 20.4 pounds or 20.23 pounds. We are going to discuss three different ways to compare decimals and solve this problem.

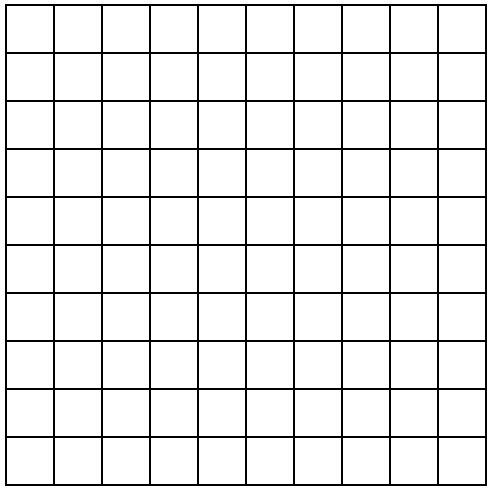
Method 1: Compare the decimals using an area model.
One way to build understanding of the size of decimals is to represent the numbers with an area model. The first grid is divided into 10 equal columns, so each column is equal to one tenth of the entire grid. The second grid is divided into 100 small squares, so each small square is one hundredth of the entire grid.

Both weeks Rob shipped a little over 20 pounds. The whole number of pounds shipped was the same for each week, so we only need to compare the decimal portions. Represent the decimal part of each number by shading the following grids.

0.4



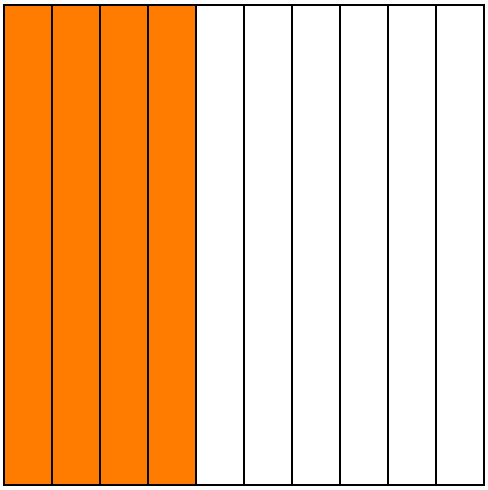
0.23



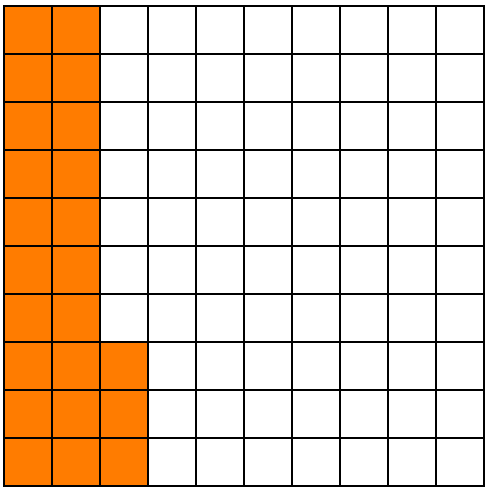
MakingSense

Use the grids to explain which number is greater. If you fill in the grid by starting on the left and filling in columns, that makes it easier to compare the decimals involved. As you can see from the grids, 0.4 is greater than 0.23.

0.4



0.23



Method 2: Compare the decimals using fractions.
Another way to compare decimals is to express each decimal as a fraction and then compare those fractions to determine which is larger. Write the decimal part of each number as a fraction. Remember that 0.4 is read "four tenths" and 0.23 is read "twenty-three hundredths."

$0.4 = \frac{4}{10}$ $0.23 = \frac{23}{100}$

How do you compare $\frac{4}{10}$ and $\frac{23}{100}$?

To compare the two fractions, find a common denominator.

$\frac{4}{10} = \frac{40}{100}$

View the *Equivalent Fractions* video to review equivalent fractions.

Now compare the fractions. Since $\frac{40}{100}$ is greater than $\frac{23}{100}$, 20.4 is greater than 20.23.

Method 3: Compare the decimals using place value.
A third way to compare decimals is to look at the value of each place starting with the largest place value. Use the place value chart shown below to help you determine which number is larger.

Tens	Ones	Tenths	Hundredths
2	0	4	
2	0	2	3

Both numbers have two tens; both numbers have zero ones.
20.4 has four tenths, while 20.23 has only two tenths. So for this problem, the larger number is 20.4 because the 4 in the tenths place of 20.4 is larger than the 2 in the tenths place of 20.23.

Learning a variety of reasoning strategies to compare decimals helps students develop a deep understanding of decimals. Students who understand decimals can solve problems flexibly and recognize when answers make sense.